

Tanta Scientific Nursing Journal

Prof Dr.Afaf Abdelaziz Basal

Chairperson

Prof Dr. Sahar Mahmoud Elkhedr

Editor in Chief

Prof Dr. Ikbal Fathalla Elshafie

Managing editor^١

Assist. Prof Dr. Safaa Zahran

Managing editor^٢

Prof. Grace M. Lindsay

Dr. Lillian Ohene

Prof. Dr. Marcia Leigh Van Riper

Assist. Prof. Dr. Dalal Bashir

International Editor

Dr. Zainab Adel Allam

Dr. Mai Hassan El-sharkawy

Editor Secretary

Volume ٢٤ Number ١

(Suppl) , February

٢٠٢٢

▪ **Publisher :**

Tanta University, Faculty of Nursing

▪ **Chairperson**

Prof Dr.Afaf Abdelaziz Basal : Medical Surgical Nursing, Tanta University,

afaf.basal@nursing.tanta.edu.eg

▪ **Editor- in -Chief**

Prof Dr. Sahar Mahmoud Elkhedr: Pediatric Nursing, Tanta University,

sahar.abdelgawad@nursing.tanta.edu.eg

▪ **Managing editor**

Prof Dr. Ikbal Fathalla Elshafie: Community Health Nursing, Tanta University.

ekbal.elshafi@nursing.tanta.edu.eg

Assist. Prof Dr. Safaa Zahran: Nursing Administration, Tanta University,

safaa.zahran@nursing.tanta.edu.eg

▪ **Advisory Board**

Prof. Dr. Fouada Mohamed Ahmed Shaban: Nursing Administration, Tanta University

fouad.shaban@nursing.tanta.edu.eg

Prof. Dr. Rahma Soliman Bahget: Pediatric Nursing, Tanta University,

rahma.youssif@nursing.tanta.edu.eg

Prof. Dr. Ebtisam Mohamad Elsaied: Pediatric Nursing, Tanta University,

ebtesam.elsayed@nursing.tanta.edu.eg

Prof. Dr. Manal HassanAhmed: Obstetric and gynecological Nursing, Tanta University,

manal.hassan@nursing.tanta.edu.eg

Prof. Dr. Latifa Mahmoud Fouda: Pediatric Nursing, Tanta University,

latifa.fouda@nursing.tanta.edu.eg

Prof. Dr. Nagwa Ragb Attia: Medical Surgical Nursing, Tanta University,

nagwa.gad@nursing.tanta.edu.eg

Prof. Dr. Essmat Mohamed Gemeay: Psychiatric and Mental Health Nursing, Tanta University,

esmat.gemie@nursing.tanta.edu.eg

▪ **Editorial Board**

Prof. Dr. Om Ebrahiem Ali Elsaai: Medical Surgical Nursing, Tanta University,
om.elsaai@nursing.tanta.edu.eg

Prof Dr. Afaf Abd Elaziz Basal: Medical Surgical Nursing, Tanta University,
afaf.basal@nursing.tanta.edu.eg

Prof Dr. Sahar Mahmoud Elkhedr: Pediatric Nursing, Tanta University,
sahar.abdelgawad@nursing.tanta.edu.eg

Prof. Dr. Reda Abd Elfatah Gad: Nursing Administration, Tanta University,
reda.gad@nursing.tanta.edu.eg

Prof. Dr. Karima Ahamad Elsaid: Nursing Administration, Tanta University,
karima.mohamed@nursing.tanta.edu.eg

Prof. Dr. Safa Eldemerdash: Nursing Administration, Tanta University,
safaa.eldemerdash@nursing.tanta.edu.eg

Prof. Dr. Samar Ghadery: Nursing Administration, Tanta University,
samer.ahmed\@nursing.tanta.edu.eg

Prof. Dr. Mervat Hosny Shalby: Psychiatric and Mental Health Nursing, Tanta University,
mervat.shalabi@nursing.tanta.edu.eg

Prof Dr. Amany lotfi Abdl Aziz : Medical Surgical Nursing, Tanta University,
amany.ismail@nursing.tanta.edu.eg

Dr. Gehan Abdelhakim Younis: Critical Care Nursing. Tanta University,
gehan.younas@nursing.tanta.edu.eg

Dr. Safa Eid Said Ahmad: Critical Care Nursing. Tanta University,
Safaa.khalil@nursing.tanta.edu.eg

Dr. Manal Abd Allah Jaheen: Obstetric and gynecological Nursing, Tanta University,
manal.gaheen@nursing.tanta.edu.eg

Dr. Azza Fouad Eladahm : Obstetric and gynecological Nursing, Tanta University,
azza.eladham@nursing.tanta.edu.eg

Dr. Entisar AboElghite Elhossiny: Community Health Nursing, Tanta University,
dr.entisaraboelghite@nursing.tanta.edu.eg

▪ **External Editorial Board**

Prof. Dr. Enass Kassem : Obstetric and gynecological Nursing, Menofieya University,

krmenas@yahoo.com

Prof. Dr. Sanaa Habashy: Psychiatric and Mental Health Nursing, Alexandria University,
sanaashaheen^٤@yahoo.com

Prof. Dr. Nazek Ebrahim Abd Elghany: Community Health Nursing, Alexandria University,
prof_nazek@yahoo.com

Prof. Dr. Nefertiti Hasan Zaki: Obstetric and gynecological Nursing, Alexandria University,
Nefertiti.zaki@alex.edu.eg

Prof. Dr. Yomn Yousef Sabry: Pediatric Nursing, Alexandria University,
dr_yomn٧٠٠٥@yahoo.com

Prof. Dr. Sohier Mohamed Wehida: Medical Surgical Nursing, Alexandria University,
wehidasohier@gmail.com

Prof. Amal Sobhe, Psychiatric Nursing and Mental Health, Port said university,
sunmoonstars٧٧٧a@gmail.com, sunmoonstars٧٥@yahoo.com

Prof. Dr. Kawthar Tolbah: Medical Surgical Nursing, Alexandria University,
kawthartolba@gmail.com

Prof Dr. Mimi Mohamed Mikawy : Medical Surgical Nursing, Assiut University,
mekkawymimi@yahoo.com , mim.mohamed@aun.edu.eg

Prof. D. Amaal Kadry Nicola: Critical Care Nursing, Alexandria University,
amalkadrynicola@gmail.com, amal.attia@alexu.edu.eg

Dr. Sahar Mansour Lamadah: Obstetric and gynecological Nursing, Tanta University,
dr.saharlamadah@yahoo.com

Prof. Dr. Zakia Toma : Community Health Nursing, Alexandria Univity, ztoama@gmail.com

Prof. Dr. Yomn Yousef Sabry: Pediatric Nursing, Alexandria University,

Prof. Dr. Manal Mousa Ibrahim: Obstetric and gynecological Nursing, Menofyia University,
mmmoussa٧٧@yahoo.com, manal.mousa@nursing.menofia.edu

Prof. Dr. Warda Yousef Mohamed Elmoursy: Critical Care Nursing ,Cairo University,
dr.wardayoussef@yahoo.com

Prof. Dr.Wafaa Ismail Sallam: Medical Surgical Nursing, Mansura University,
dr_wafaaismail@yahoo.com

Prof.Dr. Wafaa Ali Gamil: Medical Surgical Nursing, Mansura University,
drwafaaali@yahoo.com

Prof. Dr. Wafaa Hassan: Medical Surgical Nursing, Menoufia University,
wafaa.hassan@nursing.menofia.edu.eg

▪ **International Editorial Board**

Prof. Grace Lindsay: Medical-Surgical Nursing,

Saudi Arabia Makkah ٢١٩٥٥, P.O. Box ٧١٥ Umm AlQura University, Saudi Arabia,
gracemlindsy@gmail.com

Dr. Lillian Ohene : Pediatric nursing, Ghana Legon,

Accra P.O. Box LG ٤٣ School of Nursing and Midwifery, University of Ghana,
lohene@ug.edu.gh

Assist. Prof. Dr. Dalal Bashir: President of the Arab Scientific Association for Nursing and the
Assistant Professor of Maternal Health, Faculty of Nursing, Elzaitona University, Jordon.,
bashir_dalal@yahoo.com

Prof. Dr. Marcia Leigh Van Riper : Professor and Chair, Family Health Division University of
North Carolina, School of Nursing/ Carolina Center, vanriper@email.unc.edu

▪ **Editor Secretary **

Dr. Zainab Adel Allam: Critical Care Nursing , Tanta University,
zainab.alam@nursing.tanta.edu.eg.

Dr. Mai Hassan El-sharkawy: Pediatric Nursing, Tanta University,
mai_elsharkawy@nursing.tanta.edu.eg

Information to Authors

General policies

The Bulletin of Tanta Scientific Nursing Journal publishes concise, original articles and contributions in the board field of nursing sciences. The Editor is responsible for the view and statements of authors expressed in their articles.

The authors must transfer all copyright townships of the published manuscripts to the Bulletin of Tanta Scientific Nursing Journal.

Table and figures are permitted to be used by authors.

Provide the proper reference is made to the original published manuscripts and the journal.

Preparation of Manuscript:

Format: three complete copies should be submitted. Manuscripts should be printed on A^٤, ٨٠ gm paper, ١,٥ line space with ٢,٥ cm margins. Manuscripts should not exceed two column, ١٢ pages, and inclusive references. CD containing the manuscripts should be enclosed.

Title of manuscripts:

It should be concise not more than ١٥ words and include the name of the authors(s) professional title and institution affiliation.

Abstract:

It should not exceeding ٣٠٠ words, it should state the aim of the study , subjects and methods and important findings and conclusion. Below the abstract provide and identify ٣ to ١٠ key words or short phrases for indexing according to the contemporary subject headings. A list of all used abbreviations should be provided after the abstract. Abbreviations are not placed in parentheses at first use in the text

Introduction:

It should include relevant literature related to the problem. Abbreviations should be spelled out the first time they are used. Symbols, others than standard statistical symbols, should be identified the first time used.

Subject and methods:

It should include the study design, setting where the study was done, subjects of the study and criteria for selection, tools for data collection, methods of data analysis and procured.

Results:

Tables, figures or graphs should be typed or drawn on one page and relative placement should be noted in the text.

Discussion:

It should illustrate the findings with other relevant studies in the field of studies in the field of study

Conclusion

Summaries the key findings, outcomes or information in your report

Recommendations

Are the actions you are suggesting should take place bearing in mind your conclusion

References:

They are numbered according to order of appearance in the text and should follow the style of the uniform requirements for manuscripts submitted to the journals. The Vancouver style should be followed

Procedures

All papers will be reviewed by three .The final decision to publish or reject the manuscript remains in the hand of the editor. All manuscripts will be sent to a statistical reviewer. Proof reading of manuscripts for linguistic and typographic sounds will be done by the editors will be returned .The initial review process is expected to take ٧ weeks. Accepted manuscripts become the property of the Tanta nursing scientific journal. The journal reserves the rights to edit all manuscripts for its style and space requirements and for the purpose of the clarity of Tanta journal of nursing will determine in which volume and issue accepted manuscripts will appear

Faculty of Nursing, Tanta University**Address:**

Email: vd_research@nursing.tanta.edu.eg

Email: sahar.abdelgawad@nursing.tanta.edu.eg

Title	Page
Association between Community Integration and Mental Health Recovery among Patients with Psychiatric Disorders Souzan Abd Elmenem Abd Elghafar Harfush^١, Amal Awad Abd El-Nabi Moussa^٢, Samar Mabrook Elnehrawy^٣ ^١ Assistant Professor of Psychiatric Nursing and Mental Health, Faculty of Nursing, Tanta University. ^٢ Assistant Professor of Psychiatric Nursing and Mental Health, Faculty of Nursing, Damanhour University ^٣ Lecturer of Psychiatric Nursing and Mental Health, Faculty of Nursing, Tanta University.	١١-٣٤
Effect of Social Skills Enhancement Training Program on Negative Symptoms among Patients with Schizophrenia Sara Abdallah Abdelgelil^١, Ayat Saif Elyazal^٢, Ahmed Abel-Rahman Mubarak^٣, Zebeda Abdelgawad Elsherif^٤ ^١ Assistant lecturer, Psychiatric and Mental Health Nursing, Faculty of Nursing, Tanta University, Egypt, ^٢ Assistant Professor of Psychiatric/ Mental Health Nursing, Faculty of Nursing, Tanta University, Egypt ^٣ Professor of Neuro- Psychiatry, Faculty of Medicine, Tanta University, Egypt ^٤ Assistant Professor of Psychiatric/ Mental Health Nursing, Faculty of Nursing, Tanta University, Egypt	٣٥-٧٣
Effect of Transition Care Educational Program on Transitional Readiness, Self-Efficacy and Quality of Life among Adolescents with Type ١ Diabetes Mellitus Amal Gharib Sabaq^١, Samah El Awady Bassam^٢ and Khadiga M. Said^٣ ^١ Assistant Professor of Pediatric Nursing, Faculty of Nursing, Benha University, Egypt. ^٢ Assistant Professor of Pediatric Nursing, Faculty of Nursing, Zagazig University, Egypt. ^٣ Assistant Professor of Pediatric Nursing, Faculty of Nursing, Benha University, Egypt	٧٤-١٠٣
Relation between Perceived Social Support and psychological Stress among patients with Depressive disorder Amina Morsy Elmonir Abd Elhady^١, Zebeda Abd Elgwad Hessain Elshreif^٢, Mai Abd El Raoaf Eissa^٣, Aml Ibrahim Sabra^٤ ^١ Nursing Specialist, Kafer El Sheikh Fever Hospital, Egypt, ^{٢,٤} Assistant Professor of Psychiatric and Mental Health Nursing Faculty of Nursing, Tanta University, Egypt. ^٣ Professor and Head of Neuro psychiatry Department Faculty of Medicine , Tanta University, Egypt.	١٠٤-١٢٥
Efficacy of Protocol of Hygienic Care by Chlorhexidine Gluconate on the Occurrence of Catheter Associated Urinary Tract Infection among Critical Ill Patients Eslam Ebrahim Abd-El Hak^١, Zeainb Mohammed Sahban^٢, El Sayed Mohamed Tag El din^٣, Seham Ahmed Abd ElHay^٤ ^١ Demonstrator, Critical Care and emergency Nursing, Faculty of Nursing, Tanta University, Egypt. ^٢ Lecturer of Critical Care and Emergency Nursing Tanta University, Egypt. ^٣ Professor of Neuropsychiatry Diseases ,Faculty of Medicine, Tanta University, Egypt. ^٤ Professor of Medical- Surgical Nursing ,Faculty of Nursing, Tanta University, Egypt.	١٢٦-١٥٢

<p>Effectiveness of adoption of positive coping strategies on women's knowledge and practices related to endometriosis</p> <p>ˆ Sabah Lotfy Mohamed El Sayed, ˆ Mohamed Lotfy Mohamed El Sayed, ˆ Amany S. Badawy,</p> <p>ˆ Department of Obstetrics and Gynecology Nursing, Faculty of Nursing, Zagazig University, Egypt.</p> <p>ˆ Department of Obstetrics and Gynecology, Faculty of Human Medicine, Zagazig University, Egypt.</p> <p>ˆ Department of Obstetrics and Gynecology Nursing, Faculty of Nursing, Zagazig University, Egypt.</p>	١٥٣-١٧١
<p>Effect of Educational Program for Nurses on Clinical Outcomes of Cancer patients with Metastatic Spinal Cord Compression</p> <p>ˆ Shaimaa Abd El Salam. Khalil, ˆ Sheren Mohammed.Diab, ˆ Mohammed A. Alam El-Din, ˆ Om Ebrahiem Ali. El-Melegy</p> <p>ˆ Assistant lecturer, Medical –Surgical Nursing, Faculty of Nursing, Tanta University, Egypt.</p> <p>ˆ Lecturer of Critical Care and Emergency Nursing Tanta University, Egypt</p> <p>ˆ Professor of Clinical Oncology, Faculty of Medicine, Tanta University, Egypt.</p> <p>ˆ Professor of Medical- Surgical Nursing (Main Supervisor) Faculty of Nursing, Tanta University, Egypt</p>	١٧٢-١٩٩
<p>Effect of Nursing Intervention on Fatigue for Multiple Sclerosis Patients</p> <p>* Rasha Awad Abd'Elamgied Salime ˆ, Donia Atef Ibrahim Elzehiri ˆ, Reda Abdel Salam Ibrahim ˆ</p> <p>ˆ Lecturer of Adult Health Care Nursing, Faculty of Nursing, Helwan University, Egypt ˆ</p> <p>ˆ Lecturer of Community Health Nursing, Faculty of Nursing, Helwan University, Egypt ˆ</p> <p>ˆ Lecturer of Medical Surgical Nursing department, Faculty of Nursing Tanta University ˆ</p>	٢٠٠-٢٢٣
<p>Effect of Foot Reflexology with Pharmacological Treatment on Pain and Quality of Life among Elderly Suffering from Osteoarthritis</p> <p>ˆ Samia Ibrahim Baraka. ˆ Ikbal Fathalla Elshafie, ˆ Hanan Mohamed Al-saadaney , ˆ Entisar Abo Alghite El-Hossiny Elkazeh and ˆ Samira El-Saied El- Mazayen.</p> <p>ˆ Assistant Lecturer, of Community Health Nursing, Faculty of Nursing, Tanta University, Egypt</p> <p>ˆ Professor of Community Health Nursing, , Faculty of Nursing , Tanta University, Egypt</p> <p>ˆ Professor of Physical Medicine, Rheumatology and Rehabilitation Department, Faculty of Medicine, Tanta University, Egypt</p> <p>ˆ Assistant Professor of Community Health Nursing, Faculty of Nursing , Tanta University, Egypt</p>	٢٢٤-٢٥١
<p>The Effect of Premenstrual Syndrome among Adolescent Nursing Female Students on Their Quality of Life</p> <p>Fatma El-Sayed Soliman ˆ, Hanan Abo El-Gamelen Ebrahim Essa ˆ and Amira A. Elbially ˆ</p> <p>ˆ Assistant Professor of Community Health Nursing, Faculty of Nursing , Tanta University, Egypt</p> <p>ˆ Professor of Community Health Nursing, , Faculty of Nursing , Tanta University, Egypt</p> <p>ˆ Lecturer Professor of Community Health Nursing, , Faculty of Nursing , Tanta University, Egypt</p>	٢٥٢-٢٧٣
<p>Pregnant women's concerns about Coronavirus disease ٢٠١٩ (COVID-١٩) and its relationship to their preventive behaviors</p> <p>ˆ Shimaa Mohamed Hashem ˆ, Rania El-Kurdy ˆ, Ekbalebrahim Abdelmenem ˆ</p> <p>ˆ Lecturer of Maternal and Neonatal Health Nursing Dept, Faculty of Nursing, Tanta University, Egypt.</p> <p>ˆ Lecturer of Woman's Health and Midwifery Nursing, Faculty of Nursing, Mansoura</p>	٢٧٤-٣٠٤

University, Egypt.	
Effect of Health Belief Model-based Educational Intervention on COVID-١٩ Preventive Behaviors among Pregnant Women Hend Abdallah EL Sayed* ١; AhlamElahmady Sarhan ٢ ١ Assistant Professor of Obstetrics and Woman Health Nursing, Faculty of Nursing, Benha University, Egypt ٢ Assistant Professor of Community Health Nursing, Faculty of Nursing, Benha University, Egypt	٣٠٥-٣٣٥
Assessment of Nurse's Knowledge and attitude regarding WHO breastfeeding guideline during COVID-١٩ ١ Asmaa AnwarAbdelgilil, ٢ Heba Ibrahim Mohamed ٣ Nagwa Ibrahim Elfeshawy ١ Lecturer of Woman's Health and Midwifery Nursing, Faculty of nursing, Kafrelsheikh University ٢ Lecturer of pediatric nursing, Faculty of nursing, Kafrelsheikh University ٣ Lecturer of Woman's Health and Midwifery Nursing, Faculty of Nursing, Mansoura University.	٣٣٦-٣٥٦
Knowledge, attitudes and practices of food handlers about food safety at Fayoum restaurants. Amal Yousef Abdelwahed ١,٢, Shahira Mohamed Metwaly ٣, Asmaa Kamal ٤, Zainab Gazar Alkotb Alagamy ٥ ١ Assistant Professor of Community Health Nursing, Faculty of Nursing Damanhour University, Egypt ٢ Assistant Professor of Public Health, College of Health Sciences, Saudi Electronic University, Dammam, Saudi Arabia ٣ Lecturer of Community Health Nursing, Faculty of Nursing, ٦ October University. , Egypt ٤ Assistant Professor of Nursing Administration Department, Faculty of Nursing, Fayoum University, Egypt ٥ Assistant Professor of Community and Geriatric Health Nursing, Faculty of Nursing Fayoum University, Egypt	٣٥٧-٣٧٩
Effect of Educational Program on Nurses' Competency Regarding Providing Palliative Care for Children with Advanced Stage of Cancer Samar Abd-ElrahmanAbd-ElrahmanRadwan ١, Sahar Mahmoud El-KhedrAbd-Elgawad ٢, Amal Abo-El-AzmAbd El-Rahman Younis ٣ ١ Demonstrator of Pediatric Nursing, Faculty of Nursing/ Tanta University, Egypt. ٢ Professor of Pediatric Nursing, Faculty of Nursing/ Tanta University, Egypt. ٣ Lecturer of Pediatric Nursing, Faculty of Nursing/ Tanta University, Egypt.	٣٨٠-٤٠٨

Association between Community Integration and Mental Health Recovery among Patients with Psychiatric Disorders

Souzan Abd Elmenem Abd Elghafar Harfush^١, Amal Awad Abd El-Nabi Moussa^٢, Samar Mabrook Elnehray^٣

^١ Assistant Professor of Psychiatric Nursing and Mental Health, Faculty of Nursing, Tanta University.

^٢ Assistant Professor of Psychiatric Nursing and Mental Health, Faculty of Nursing, Damanshour University

^٣ Lecturer of Psychiatric Nursing and Mental Health, Faculty of Nursing, Tanta University.

Corresponding Author : *Souzan Abd Elmenem Abd Elghafar*

Email : *Suzan.ahmed@nursing.tanta.edu.eg*

Abstract

Background: The practice of integrating mentally ill patients back into the community is drawing attention all over the world. Community integration is essential for people with mental illness because it promotes their physical and mental health, life satisfaction, well-being and quality of life. It requires the mental health system, public health, and social services to develop innovative ways to help patients with psychiatric disorders to regain their place in the communities. **Aim:** assess the levels of community integration and mental health recovery among patients with psychiatric disorders and explore the association between both of them. **Design:** Descriptive correlational research design was utilized. **Setting:** The study was conducted at psychiatric outpatient clinic that is affiliated to Tanta University. **Sample:** A purposive sample of ١٠٠ patients with psychiatric disorders. **Tools:** Three tools were used to collect data, Socio-demographic and clinical characteristics, Community integration scale for adult with psychiatric problems (CIS-APP) and Recovery assessment scale-revised (RAS-R). **Method:** Each patient who attend to the outpatient clinic and met the inclusion and exclusion criteria was interviewed by the researcher on an individual base, in privacy to establish rapport and gain his trust, sign the informed consent, and complete the study tools. **Results:** The majority of the patients had lower levels of community integration and mental health recovery. In addition, a statistically significant positive correlation between community integration and recovery was detected. **Conclusion:** The studied patients had poor community integration and mental health recovery. Community integration and recovery are correlated and influencing each other. Social community integration is the first main predictor of mental health recovery among the studied psychotic patients. **Recommendation:** Continuous efforts are needed to improve social community integration among the patients via applying different programs for social skills training and assertiveness skills that strengthen patient's ability to form relationships with others in the community and subsequently enhance their recovery.

Key words: Community Integration, Mental Health Recovery and Patients with Psychiatric Disorders.

Introduction

Over the past years psychiatric care encouraged hospitalization; however, social and economic pressures as well as advances in treatment, which were managed in a more integrated and effective fashion, articulating pharmacological, psychological and psychosocial interventions lead to changes in mental health service provision through deinstitutionalization and decrease of days spent in psychiatric hospitals ^(١). The movement of deinstitutionalization is not only for the existing patients but also for the newly hospitalized patients, highlighting the importance of community integration for people with psychiatric disorders ^(٢). The practice of integrating mentally ill patients back into the community is drawing attention all over the world. It is perceived as a principle, value, and major goal of mental health policy ^(٣).

Community integration is defined as the degree in which individuals with psychiatric disorders have the opportunity to benefits from the existing resources in their community and detached from the role of a psychiatric patient living in a protected environment, having an independent stance from their illness and assuming their self-management. ^(٤,٥). Wong and Solomon

(٢٠٠٢) attempted to clearly define community integration by dividing it into three dimensions: physical, social and psychological. Physical integration refers to participating in everyday community activities and using community resources; social integration refers to maintaining social relationships with community members and being aware of support resources in the surrounding environment; and finally psychological integration refers to developing affects and sense of belonging that help in developing social relationships. ^(٦) Other recent studies have suggested that independence/self-actualization derived from independent living, meaningful and productive activity is critical factor for helping people with psychiatric disorders integrate into the community ^(٧,٨).

Factually, people with mental illness may experience more problems integrating into the community than people without mental illness ^(٩). Previous community integration studies have identified several factors such as psychopathology, public stigma, social functions, service program characteristics, and neighborhood characteristics ^(١٠-١٤). These factors should be considered when developing a program to foster community integration among patients with mental

illness. The literature indicated that community integration is essential for people with mental illness because it promotes their physical and mental health, life satisfaction, well-being and quality of life (QOL) ^(١٥,١٦). Moreover, it provides indirect support via casual community relationships developed through regular contact with other people who live and work in the same community and foster their recovery ^(١٧).

Along the same line, facilitation of recovery has become the goal of mental health systems around the world for individuals with psychiatric disorders (Salzer et al ٢٠١٤) ^(١٨). Recovery is defined as ‘a way of living a satisfying, hopeful and contributing life even with limitations caused by illness. As such recovery implies that persons with mental disorders experiencing themselves as recovering a new sense of self and purpose within and beyond the limits of the disability. Hope, optimism, and positive identity are central features of recovery’ ^(١٩,٢٠).

Realistically, there is no single definition of the concept of recovery for people with mental health problems, but there is a guiding principle as the ability to control their life rather than the subtle state of returning to premorbid level of functioning. Recovery does not focus on full symptom

resolution but emphasizes resilience and control over problems and life. The aims of recovery are to help people with mental illnesses and distress to look beyond mere survival and existence. It encourages them to move forward and set new goals. It supports the view that they should get on with their lives, do things and develop relationships that give their lives meaning ^(٢١-٢٣).

As the recovery process is greatly influenced by people's expectations and attitudes, it requires a well-organized system of support from family, friends or professionals. It also needs the mental health system, public health, and social services to develop innovative ways to help patients with psychiatric disorders regain their place in the communities. Previous research has emphasized the importance of community integration as a core strategy to foster recovery in people with psychiatric disorders ^(٢٤). Therefore, it is necessary to understand how the multidimensional aspects of community integration affect mental health recovery. This knowledge can provide an empirical basis for establishing intervention strategies for mental health recovery in people with mental health difficulties living in the community.

Aim

- Assess the levels of community integration and mental health recovery among patients with psychiatric disorders.
- Explore the association between community integration and mental health recovery among patients with psychiatric disorders.

Subjects and Method

Research questions

- What are the levels of community integration and mental health recovery among patients with psychiatric disorders?
- Is there any association between community integration and mental health recovery among patients with psychiatric disorders?

Research design: Descriptive correlational research design was utilized.

Setting: The study was conducted at psychiatric outpatient clinic that is affiliated to Tanta University, the outpatient clinic works ٤ days/week and ٨ hrs. / day and offer free services to all psychiatric patients.

Subjects

A purposive sample of ١٠٠ patients with psychiatric disorders who lived at the community was recruited. The sample size was calculated using Epi-Info software statistical package. The criteria used for sample size calculation were as follows: ٩٥% confidence limit and expected correlation between community integration and

recovery is ٧٠%. Based on the above-mentioned criteria the sample size should be ٩٢ patients, so, the researchers decide to increase the sample size to ١٠٠ patients to increase reliability of the study results.

Inclusion criteria

- Diagnosed with psychiatric disorders based on DSM-٥ criteria
- ٢١ years old and above.
- Able to communicate in a coherent and relevant manner

Exclusion criteria

Any evidence of organic brain disease, mental retardation, substance use disorder, and \ or other psychiatric comorbidity

Tools of the study

Three tools were used to collect data for this study.

Tool I: Socio-demographic and clinical characteristics.

It was developed by the researchers and covering patient's socio-demographic characteristics as age, sex, level of education, occupation, income, residence, and cohabitation. Clinical characteristics includes diagnosis, duration of illness and community services usage status.

Tool II: Community integration scale for adult with psychiatric problems (CIS-APP)

It is developed by Barreto Carvalho & Cabral (٢٠١٢) ^(٢٤). It consists of ٣٤ items divided into four subscales namely: the Physical Community Integration dimension (٨ items) assessing the extent to which individuals spend their time outside their homes, participate and use community resources by self-initiative; the Social Community Integration dimension (١٢ items) assessing the degree with which individuals are involved in social interactions with other (healthy) members of their community, and the quantity and quality of these relationships; Psychological Community Integration dimension (٧ items) assessing the extent to which individuals perceive themselves as a part of their community, bond emotionally to their neighbors, believe in their ability to satisfy their needs and to influence the community. Finally, the Independence dimension (٧ items) assessing the individuals' capacity to develop their daily activities autonomously. Items are responded in a scale ranging from ١ (completely disagree) to ٥ (completely agree), in which higher scores indicate higher levels of community integration. The score calculated as follow:

Less than ٥٠% indicates poor community integration

A score of ٥٠-٧٥ indicates fair community integration

A score greater than ٧٥% indicates good community integration

Tool III: Recovery assessment scale-revised (RAS-R)

It is developed by Giffort et al., (١٩٩٩) ^(٢٥). It is the most widely used scale to measure mental health recovery. The scale consists of ٢٤ items divided into five subscales namely, Willingness to ask for help (٣ items), Goal and success orientation (٥ items), Reliance on others (٤ items), Personal confidence and hope (٩ items), Not dominated by symptoms (٣ items). The patient's responses were pointed on five points likert scale that ranging from ١ = strongly disagree to ٥ = strongly agree. Higher scores indicating higher perceptions of mental health recovery.

The score calculated as follow:

- Less than ٥٠% indicates poor mental health recovery
- A score of ٥٠-٧٥ indicates fair mental health recovery
- A score greater than ٧٥% indicates good mental health recovery

Methods

- An official approval was obtained from the director of the psychiatric outpatient clinic to collect the study data.

-Tool I was developed by the researchers after thorough review of literature.

- Tools II & III were translated into Arabic language by the researchers and then back translated. Results showed that the back translation were similar with the original one. Content validity was examined by panel composed of five experts in the psychiatric nursing fields. No modification was required.

- A Pilot study was carried out on ١٠% of patients with psychiatric disorders to ensure the clarity and applicability of the study tools. According to its results no modifications were done.

-Tools II & III were then tested for their reliability by using Cronbach alpha and found to be $\alpha=0,829$ and $0,709$ respectively which indicates good internal consistence.

- During the actual study, the researchers firstly interviewed with the responsible physicians and staff nurses at the outpatient clinic to illustrate the purpose of the study and to gain their support and assistance. Following this step, each patient who attends to the outpatient clinic and met the inclusion and exclusion criteria was referred to the researchers by the treated psychiatrist. The researchers then verified the appropriateness

of the potential subjects by using patients' health records.

-Each patient was contacted on an individual base and interviewed in privacy by the researcher to establish rapport and gain his trust, sign the informed consent, and complete the study tools.

- Each interview lasted between ٣٠ to ٤٥ minutes. Data collection was completed over a period of ٣ months starting from the first of November ٢٠٢٠ to the end of January ٢٠٢١.

Ethical considerations

- Study procedure was revised and approved by the Ethical Committee of the Faculty of Nursing, Tanta University.

- Informed consent was obtained from the patients after explanation of the purpose of the study.

-The participant's right to refuse participation in the study was maintained. They also reassured about the confidentiality of their obtained information.

Statistical analysis

The collected data was organized, tabulated and statistically analyzed using SPSS version ١٩ (Statistical Package for Social Studies) created by IBM, Illinois, Chicago, USA. For numerical values, the range, mean and standard deviations were calculated. The differences between two mean values were

employed using student's t test. For categorical variable, the number and percentage were calculated. The correlation between two variables was estimated using Pearson's correlation coefficient (r) if the two variables are numerical and Spearman's rank correlation (rho) if one of the two variables was ordinal. Regression analysis used for the parameters of community integration. The level of significant was adopted at $p < 0.05$.

Result

Table (1) presents the socio-demographic and clinical characteristics of the studied participants. In relation to age, the total subjects mean age was 34.38 ± 9.03 years with 38 % being in the age group ranging from 20 to less than 30 years. As for sex, male patients outnumbered females (68% & 32% respectively). Concerning marital status, patients who were single and married nearly take the same percent 36% & 39% respectively). As regards the educational status, the highest percentage (36%) was for university education while the least one was for primary education (14%). In relation to residence, around two thirds of the studied patients (60 %) were living in urban compared to 30% who were living in rural areas and more than half of them (54%) reported that their monthly income is not

enough. The vast majority of patients (88%) were living with their families and 60% using community services. Regarding diagnosis, more than half of patients (54%) were schizophrenic with a mean 6.88 ± 4.93 for duration of illness in which 53% had a duration of illness ranged from four to six years.

Table (2) shows the distribution of the studied participants according to total score of community integration and recovery scales. Regarding to community integration scale; 81% of patients had poor community integration in total score with a mean of 46.31 ± 4.70 . In relation to community integration subscales, 67 % of patients had poor level in physical and social subscales. Around three quarter of them (74%) had poor integration in psychological subscale and finally 56% of patients had poor level of independence subscale while 47% had fair level. Speaking of the mean score; the highest mean 46.98 ± 6.43 was for social subscale and the lowest one 40.20 ± 7.80 was for physical subscale.

As regards recovery scale; the vast majority of patients (93%) had poor level of recovery in total score with a mean of 43.69 ± 6.00 . As for recovery subscales, 87%, 80% & 84% of the studied participants had poor levels in goal and success orientation subscale,

willing to ask for help subscale and not dominated by symptoms subscale respectively. Moreover, 77% had poor level in personal confidence and hope. Lastly, 00% had poor level in reliance on others subscale compared to 44 % who had fair level. In relation to the mean score, the greatest score was for personal confidence and hope 46.22 ± 9.03 and the smallest one for not dominated by symptoms subscale 41.13 ± 10.72 .

Table (3) displays the correlation between total scores and subscales of community integration and recovery scales. From this table it can be observed that, there is a statistically significant positive correlation between total score and subscales of community integration scale and total score and subscales of recovery scale.

Table (4) present regression analysis for the parameters of community integration. Concerning to sex, there was a statistically significant positive correlation between sex and total score of community integration and almost all its subscales except social subscale only. ($P = 0.001^*$, 0.01^* , 0.001^* & 0.002^* respectively). In this respect, female patients had the highest mean 49.00 ± 6.47 , 48.13 ± 11.04 , 50.18 ± 10.13 & 54.11 ± 10.91 respectively.

affecting recovery. The table shows that three subscales of community integration namely, social, psychological and independence had a significant effect on recovery level of the studied patients. ($P = 0.001^*$, 0.027^* & 0.008^* respectively).

Table (5) illustrates the relationship between community integration total score and subscales and sociodemographic and clinical characteristics. It was noted that, age had a statistically significant positive correlation with total score of community integration and all its subscales namely, physical, psychological, social, and independence. ($P = 0.008^*$, 0.001^* , 0.001^* , 0.001^* & 0.001^* respectively). In which those patients with age ranged from 20 to less than thirty years had the highest mean 48.02 ± 6.32 , 48.06 ± 10.73 , 50.63 ± 9.38 , 48.98 ± 8.33 & 54.92 ± 9.90 respectively compared to other age group.

Again, a statistically significant positive correlation was detected between educational level and total score of community integration and all its subscales ($P = 0.001^*$). It was found that patients with university level of education had the uppermost mean 50.20 ± 3.70 , 50.90 ± 7.37 , 50.24 ± 8.84 , 50.60 ± 6.06 & 50.48 ± 10.00 respectively.

On the other hand, no statistically significant positive correlation was detected between total score of community integration and all its subscales and the rest of socio-demographic and clinical characteristics explicitly, marital status, residence, use of community services, diagnosis, and duration of illness.

Table (٦) illuminate the relationship between total score and subscales of recovery and socio-demographic and clinical characteristics. It was found that a statistically significant positive correlation was noticed between total score and subscales of recovery and some of socio-demographic characteristics namely, age, sex and educational level, while paradoxically no statistically significant correlation was detected with the rest of socio-demographic

and clinical characteristics. More specifically, the patients with age group ranging from ٢٠ to less than ٣٠ years had the highest mean in total score of recovery and all subscales compared to other age group ($٤٧,٣٦ \pm ٧,٦٤$, $٥٠,٦٨ \pm ١١,٤٤$, $٤٨,٨٩ \pm ١١,٩٣$, $٢٣,٦١ \pm ٣,٦٠$, $٥٠,١٤ \pm ١١,٤٩$ & $٤٦,١١ \pm ١٠,٢٠$ respectively).

Regarding to sex, female patients take the highest mean in total score as well as in all subscales ($٤٧,٣٧ \pm ٧,٩٢$, $٥٠,٢١ \pm ١١,٨٤$, $٥٠,٨٤ \pm ١١,٧٠$, $٢٣,١٩ \pm ٣,٨٦$, $٤٩,٣٨ \pm ١٢,٢٣$ & $٤٧,٥٠ \pm ١٢,٣٠$ respectively). Finally, as for educational level, university educated patients had the peak mean in total score and all subscales ($٤٧,٤٣ \pm ٦,٨٩$, $٥٠,٣١ \pm ١٠,٣٣$, $٤٩,٠٥ \pm ٩,٦٤$, $٢٢,٥٦ \pm ٣,٦٣$, $٤٨,٣٣ \pm ١٠,٨٩$ & $٤٣,٥٢ \pm ١٠,٦٣$ respectively)

Table (١): Socio-demographic and clinical characteristics of the studied participants

Socio-demographic and clinical characteristics	Number (n=١٠٠)
Age in years:	
٢٠-	٣٨
٣٠-	٢٩
٤٠-	٢٣
٥٠-	١٠
Range	٢٠-٥٥
Mean+SD	٣٤,٣٨+٩,٥٣
Sex:	
Males	٦٨
Females	٣٢
Marital status	
Single	٣٦
Married	٣٩
Divorced	٢٣
Widow	٢
Educational level:	
Illiterate	١٧
Primary	١٤
Secondary	٣٣
University	٣٦
Residence:	
Rural	٣٥
Urban	٦٥
Monthly income:	
Enough	٤٦
Not enough	٥٤
Cohabitation:	
Alone	١٢
With family	٨٨
Use of community service:	
Used	٦٠
Not used	٤٠
Diagnosis:	
Schizophrenia	٥٦
Bipolar disorders	٣٥
Major Depressive Disorders	٩
Duration of illness (in years)	
١-٣	١٥
٤-٦	٥٣
٧-٩	١٦
١٠+	١٦
Range	١-٢٢
Mean+SD	٦,٨٨+٤,٩٣

Table (٢): Distribution of studied participants by level of total score and subscales of community integration and recovery

Variables	Poor (<٥٠%)	Faire (٥٠-٧٥%)	Good (>٧٥%)	Mean+SD
Community integration sub scale				
Physical	٦٧	٣٣	٠	٤٥,٢٥+٧,٨٥
Psychological	٧٤	٢٦	٠	٤٦,٢٣+٧,٥٩
Social	٦٧	٣٣	٠	٤٦,٩٨+٦,٤٣
Independence	٥٦	٤٧	٠	٤٦,٧٧+١٠,١٤
Total score	٨١	١٩	٠	٤٦,٣١+٤,٧٠
Recovery scale				
Personal confidence and hope	٦٧	٣٢	١	٤٦,٢٢+٩,٠٣
Goal and success orientation	٨٧	١٣	٠	٤١,٦٤+٧,٩٢
Willing to ask for help	٨٥	١٤	١	٤٣,٩٣+١٠,٤٧
Reliance on others	٥٥	٤٤	١	٤٥,٥٠+٩,٢٠
Not dominated by symptoms	٨٤	١٥	١	٤١,١٣+١٠,٧٢
Total score	٩٣	٦	١	٤٣,٦٩+٦,٠٠

Table (٣): Association between total scores of community and integration and recovery scales

Community integration scale	Recovery scale									
	Physical		Psychological		Social		Independence		Total score	
	r	p	r	p	r	p	r	p	r	p
Personal confidence and hope	٠,٥٧٧	٠,٠٠١*	٠,٥١٤	٠,٠٠١*	٠,٧٧٨	٠,٠٠١*	٠,٤١٨	٠,٠٠١*	٠,٥٢٤	٠,٠٠١*
Goal and success orientation	٠,٣٠٢	٠,٠٠٢*	٠,٣٦٦	٠,٠٠١*	٠,٢١٨	٠,٠٢٨*	٠,٢١٠	٠,٠٣٦*	٠,٢٦٥	٠,٠٠٨*
Willing to ask help	٠,٤٣٢	٠,٠٠١*	٠,٤٩١	٠,٠٠١*	٠,٢٥٦	٠,٠١٠*	٠,٣٢٢	٠,٠٠١*	٠,٣٩٣	٠,٠٠١*
Reliance on others	٠,٤٣٨	٠,٠٠١*	٠,٤٠٣	٠,٠٠١*	٠,٧٠٤	٠,٠٠١*	٠,٣٢٣	٠,٠٠١*	٠,٣٩٤	٠,٠٠١*
No dominated by symptoms	٠,٤٥٢	٠,٠٠١*	٠,٤٠٩	٠,٠٠١*	٠,٤٢٩	٠,٠٠١*	٠,٣٠٠	٠,٠٠٢*	٠,٤٠٢	٠,٠٠١*
Total score	٠,٦٤٩	٠,٠٠١*	٠,٧١٥	٠,٠٠١*	٠,٦٩١	٠,٠٠١*	٠,٢٨٢	٠,٠٠٥*	٠,٦١٨	٠,٠٠١*

*Significant

Table (٤): Regression analysis for the parameters of community integration affecting recovery

Community integration subscales	OR (٩٥% CI)	P value
Physical	٠.٦٥٨ (٠,٢٦٩ – ١,٢٠٣)	٠,٠٦٢
Social	٠,٤١٨ (٠,١٨٦ – ٠,٧٤٨)	٠,٠٠١*
Psychological	٠,٥٧٢ (٠,٢٩٦ – ٠,٨٥٧)	٠,٠٢٧*
Independence	٠,٥٢٨ (٠,٠٩٥ – ٠,٨٢٩)	٠,٠٠٨*

Table (٥): Relationship between community integration total score and subscales and socio-demographic and clinical characteristics

Socio-demographic and clinical characteristics		Community integration subscales				
		Physical	Psychological	Social	Independence	Total score
Age	٢٠-	٤٨,٠٦±١٠,٧٣	٥٠,٦٣±٩,٣٨	٤٨,٩٨±٨,٣٣	٥٤,٩٢±٩,٩٠	٤٨,٠٢±٦,٣٢
	٣٠-	٤٦,٧٧±٥,٢٩	٤٦,٣١±٤,٢١	٤٨,٦٨±٥,٣٢	٥١,١٩±٣,٠٣	٤٨,٠١±٣,٠٦
	٤٠-	٤٢,٨٨±٣,٣٧	٤١,٩٨±٤,٠٢	٤٤,٦٢±٣,٧٢	٤٣,٨٥±٧,٦٢	٤٦,٣٤±٢,٤٧
	٥٠-	٣٩,٤٦±٤,٦٢	٤١,٨٤±٥,٢١	٤٢,٦٢±٢,٥١	٤٦,١٢±١٢,٣٧	٤٣,٥٣±٢,٨٩
	f. test	٥,٨٢٩	١٠,٨٣٦	٥,٦٩٥	٩,٤٨٨	٤,١٣٣
	p value	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*	٠,٠٠٨*
Sex	Males	٤٣,٨٢±٥,٤٧	٤٤,٢٠±٥,٠٧	٤٦,٠٣±٥,١٦	٤٧,٩٤±٨,٣٥	٤٥,٤٤±٣,٣٧
	Females	٤٨,١٣±١١,٠٤	٥٠,١٨±١٠,١٣	٤٨,٧٠±٨,٤١	٥٤,١١±١٠,٩١	٤٩,٠٥±٦,٤٧
	t. test	٢,٦١٣	٣,٩٤٢	١,٩٥٤	٣,١١٥	٣,٦٦٨
	p value	٠,٠١٠*	٠,٠٠١*	٠,٠٥٤	٠,٠٠٢*	٠,٠٠١*
Marital status	Married	٤٤,٠٤±٧,٣١	٤٥,٤٩±٦,٨٩	٤٥,٧٣±٧,١٢	٥٠,٠٤±١٠,٣٦	٤٦,٢٦±٤,٢٨
	Not married	٤٥,٩٤±٨,٢٣	٤٦,٥١±٨,٠٢	٤٧,٦٢±٥,٩٤	٤٩,٨٤±٩,٢٢	٤٧,٤٠±٤,٨٢
	t. test	١,١٧٧	٠,٦٥٢	١,٤٣٩	٠,١٠١	١,٢٠١
	p value	٠,٢٤٢	٠,٥١٦	٠,١٥٣	٠,٩٢٠	٠,٢٣٣
Educational level	Illiterate	٣٥,٩٩±٢,١٤	٤٦,٢٢±٦,٤١	٤١,١٨±٥,٠٣	٤٤,٧١±١٠,٠٥	٤٠,٥٥±١,٤٠
	Primary	٤١,٠٧±٢,٧٢	٣٧,١٤±٤,٧٦	٤١,٠٧±٣,٧٩	٤٧,٧٦±٩,٩٢	٤٤,٧٥±١,٩٨
	Secondary	٤٥,٨٢±٥,٦٥	٤٥,٣٧±٢,٧٤	٤٨,٢٣±٣,٧٥	٤٧,٤٥±٥,٣٤	٤٧,٦٠±٣,٤٣
	University	٥٠,٩٠±٧,٣٧	٥٠,٢٤±٨,٨٤	٥٠,٦٠±٦,٥٦	٥٥,٤٨±١٠,٠٥	٥٠,٢٥±٣,٧٥
	f. test	٣١,٩٨٠	١٤,٣٣٣	١٩,٩٠٤	٨,٠٢٤	٣٩,٣٤٦
	p value	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*
Residence	Rural	٤٣,٩٣±٨,٧٣	٤٥,٧١±٧,٦٥	٤٦,٢٩±٧,٤٩	٤٩,٥٥±٩,٤٠	٤٦,١٢±٥,٠٦
	Urban	٤٥,٨٨±٧,٤٠	٤٦,٣٣±٧,٥٨	٤٧,٢٠±٥,٨٧	٥٠,١١±٩,٨٢	٤٧,٤٠±٤,٣٥
	t. test	١,١٨٣	٠,٣٨٦	٠,٦٧٧	٠,٢٧٦	١,٣٣٠
	p value	٠,٢٤٠	٠,٥٧١	٠,٥٠٠	٠,٧٨٣	٠,١٨٧
Use of community services	Used	٤٤,١٣±٧,٩٠	٤٥,٥٧±٧,٢٠	٤٦,٦٤±٦,٧٨	٤٨,٨١±٨,٧٤	٤٦,٣٩±٤,٧٦
	Not used	٤٦,٨١±٧,٧٢	٤٦,٩٣±٨,١٣	٤٧,٢٥±٦,٠٢	٥١,٥٧±١٠,٧٣	٤٧,٧٩±٤,٣٤
	t. test	١,٦٨١	٠,٨٧٧	٠,٤٦٢	١,٤١٢	١,٤٩٤
	p value	٠,٠٩٦	٠,٣٨٣	٠,٦٤٥	٠,١٦١	٠,١٣٨
Diagnosis	Schizophrenia	٤٥,٠٤±٨,٦٣	٤٦,٨٩±٧,٩١	٤٧,٠٥±٧,٠٠	٤٩,٠٣±٨,٧٥	٤٦,٨٣±٥,١٣
	Bipolar/MDD	٤٥,٤٠±٦,٩٧	٤٥,١٣±٧,٠٩	٤٦,٦٧±٥,٧٧	٥١,٠٤±١٠,٦٥	٤٧,١١±٣,٩٣
	t. test	٠,٢٢١	١,١٥٤	٠,٢٩٦	١,٠٣٥	٠,٣٠٤
	p value	٠,٨٢٦	٠,٢٥١	٠,٧٦٨	٠,٣٠٣	٠,٧٦٢
Duration of illness	١-٣	٤٤,٠٠±٥,٨١	٤٤,١٩±٧,٧٨	٤٣,٨٩±٥,٧٦	٤٧,٠٥±١٠,٦٣	٤٦,٥١±٣,٣٥
	٤-٦	٤٥,٢٤±٨,٣٤	٤٦,٦٣±٦,٨٦	٤٨,٠٢±٦,٤٠	٥٠,٦٧±٨,٢٨	٤٦,٩٣±٥,٠٨
	٧-٩	٤٧,٥٠±٨,٢٢	٤٨,٠٤±٩,٢٣	٤٧,١٩±٥,٢٦	٥٠,١٨±١٢,٥٢	٤٨,٢٠±٤,٤٨
	١٠+	٤٣,٩١±٧,٩٦	٤٤,٢٩±٧,٨٨	٤٥,٦٣±٧,٧٢	٤٩,٨٢±١٠,١١	٤٦,٢١±٤,٣٢
	f. test	٠,٧٠٤	١,٠٦٠	١,٨٨٢	٠,٥٥٠	٠,٥٦٢
	p value	٠,٥٥٢	٠,٣٧٠	٠,١٣٨	٠,٦٥٠	٠,٦٤٢

Table (٦): Relationship between total score and subscales of recovery and sociodemographic and clinical characteristics

Socio-demographic and clinical characteristics		Recovery subscales					
		Personal confidence and hope	Goal and success orientation	Willing to ask help	Reliance on others	No dominated by symptoms	Total score
Age	٢٠-	٥٠,٦٨ ± ١١,٤٤	٤٨,٨٩ ± ١١,٩٣	٢٣,٦١ ± ٣,٦٠	٥٠,١٤ ± ١١,٤٩	٤٦,١١ ± ١٠,٢٠	٤٧,٣٦ ± ٧,٦٤
	٣٠-	٤٧,٨٧ ± ٦,٢١	٤٠,٠٠ ± ٤,٤٠	١٨,٦٧ ± ١,٤٠	٤٧,٩٢ ± ٥,٨٨	٤٥,٣٧ ± ١٠,٦٧	٤٣,٩٦ ± ٤,١٧
	٤٠-	٤٠,٧٧ ± ٣,٠٧	٤١,٨٠ ± ١١,٠٩	١٩,٦٩ ± ٤,٤١	٤٠,٠٠ ± ٤,٦٩	٣٤,٨٧ ± ٥,٧٥	٤١,٥٧ ± ٣,٤٧
	٥٠-	٤٢,٠٦ ± ٦,٦٦	٤١,٩١ ± ٨,٤٤	١٩,٤٣ ± ٢,٩٨	٣٩,٦٤ ± ٤,١٤	٣٣,٣٣ ± ٩,٠٦	٤١,٥٥ ± ٤,٦٣
	f. test	٩,١٤٦	٤,٨٦٥	١٣,١٣٦	١١,٢٧٢	١٢,٠٤٨	٦,٧٧٢
	p value	٠,٠٠١*	٠,٠٠٣*	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*
Sex	Males	٤٤,٣٥ ± ٦,٦٨	٤٠,٦٩ ± ٨,٠٧	١٩,٧١ ± ٣,٥١	٤٣,٦٨ ± ٦,٧٣	٣٨,١٤ ± ٨,٤٥	٤٢,٧٥ ± ٤,٣٢
	Females	٥٠,٢١ ± ١١,٨٤	٥٠,٨٤ ± ١١,٧٠	٢٣,١٩ ± ٣,٨٦	٤٩,٣٨ ± ١٢,٢٣	٤٧,٥٠ ± ١٢,٣٠	٤٧,٣٧ ± ٧,٩٢
	t. test	٣,١٦٢	٥,٠٠٠	٤,٤٧٨	٣,٠٠٠	٤,٤٤١	٣,٧٧٨
	p value	٠,٠٠٢*	٠,٠٠١*	٠,٠٠١*	٠,٠٠٣*	٠,٠٠١*	٠,٠٠١*
Marital status	Married	٤٤,٧٣ ± ٩,٨١	٤٤,١٠ ± ٩,٨٧	٢٠,٩٢ ± ٤,٠٧	٤٤,١٠ ± ٨,٧٣	٣٨,٨٠ ± ١٠,١٣	٤٢,٩٥ ± ٥,٣٤
	Not married	٤٧,١٨ ± ٨,٤٥	٤٣,٨٣ ± ١٠,٩٢	٢٠,٧٥ ± ٣,٩٢	٤٦,٣٩ ± ٩,٤٥	٤٢,٦٢ ± ١٠,٩١	٤٥,٠٤ ± ٦,٤٢
	t. test	١,٣٢٧	٠,١٢٩	٠,٢٠٧	١,٢١٨	١,٧٥٦	١,٦٩٤
	p value	٠,١٨٨	٠,٩٩٨	٠,٨٣٦	٠,٢٢٦	٠,٠٨٢	٠,٠٩٣
Educational level	Illiterate	٤٢,٠٩ ± ٩,٥١	٤١,٩٦ ± ٧,٧٣	٢٠,٢٤ ± ٣,٨٠	٤٢,٣٥ ± ١١,٣٤	٣٦,٠٨ ± ٨,٨٤	٤١,٧٦ ± ٦,١٣
	Primary	٣٧,٩٤ ± ٣,٠٧	٤٨,١٥ ± ١١,٨٣	٢١,٤٣ ± ٤,١١	٣٧,١٤ ± ٣,٢٣	٣٨,٥٧ ± ١٦,٧٨	٣٨,٢٧ ± ٣,٧٨
	Secondary	٤٧,٤١ ± ٥,٢٣	٣٨,١٨ ± ٧,١٢	١٨,٩٧ ± ٣,٥٧	٤٧,٥٨ ± ٣,٧٨	٤٢,٢٢ ± ٧,٣٩	٤٤,٥٢ ± ٢,٧٣
	University	٥٠,٣١ ± ١٠,٣٣	٤٩,٠٥ ± ٩,٦٤	٢٢,٥٦ ± ٣,٦٣	٤٨,٣٣ ± ١٠,٨٩	٤٣,٥٢ ± ١٠,٦٣	٤٧,٤٣ ± ٦,٨٩
	f. test	٩,٨٢٨	٧,٩٧٠	٥,٦٣٣	٧,٤٢٥	٣,٣٢٢	١١,٥٥٨
	p value	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*	٠,٠٠١*	٠,٠٤٢*	٠,٠٠١*
Residence	Rural	٤٦,٨٦ ± ١٠,٧٧	٤٤,٠٠ ± ١٠,٨٧	٢١,٢٠ ± ٤,٦٣	٤٤,٤٣ ± ٨,٨٩	٤٢,٤٨ ± ١٢,٦٤	٤٣,٦٤ ± ٥,٨٤
	Urban	٤٥,٨٨ ± ٨,٠٢	٤٣,٩٠ ± ١٠,٣٣	٢٠,٦٢ ± ٣,٥٧	٤٦,٠٨ ± ٩,٣٧	٤٠,٤١ ± ٩,٥٧	٤٤,٠٤ ± ٦,٢٣
	t. test	٠,٥١٤	٠,٠٤٧	٠,٧٠٢	٠,٨٥٤	٠,٩١٨	٠,٧٠١
	p value	٠,٦٠٨	٠,٩٦٣	٠,٤٨٤	٠,٣٩٥	٠,٣٦١	٠,٤٨٥
Use of community services	Used	٤٥,٥٢ ± ٩,٣١	٤٤,٠٠ ± ١٠,٥٧	٢٠,٦٧ ± ٤,١١	٤٥,٣٣ ± ٩,٨٢	٤١,٣٣ ± ١١,٧٠	٤٤,١٨ ± ٦,٦٥
	Not used	٤٧,٢٨ ± ٨,٦١	٤٣,٨٣ ± ١٠,٤٥	٢١,٠٥ ± ٣,٧٦	٤٥,٧٥ ± ٨,٢٩	٤٠,٨٣ ± ٩,٢١	٤٤,٢٩ ± ٥,٢٠
	t. test	٠,٩٥٤	٠,٠٧٨	٠,٤٧٢	٠,٢٢١	٠,٢٢٨	٠,٠٨٩
	p value	٠,٣٤٣	٠,٩٣٨	٠,٦٣٨	٠,٨٢٦	٠,٨٢٠	٠,٩٢٩
Diagnosis	Schizophrenia	٤٦,٨٣ ± ٩,٤٨	٤٤,١٧ ± ١١,٢٠	٢٠,٩٣ ± ٤,٢٨	٤٦,١٦ ± ٩,٨٦	٤٢,٦٢ ± ١١,٧٧	٤٤,٨٨ ± ٦,٦٦
	Bipolar/MDD	٤٥,٤٦ ± ٨,٤٧	٤٣,٦٤ ± ٩,٥٩	٢٠,٦٨ ± ٣,٥٦	٤٤,٦٦ ± ٨,٣١	٣٩,٢٤ ± ٩,٠٠	٤٣,٣٩ ± ٥,٢٠
	t. test	٠,٧٥١	٠,٢٥٠	٠,٣٠٨	٠,٨٠٩	١,٥٧٥	١,٢٢٠
	p value	٠,٤٥٤	٠,٨٠٣	٠,٧٥٩	٠,٤٢٠	٠,١١٩	٠,٢٢٥
Duration of illness	١-٣	٤١,٧٨ ± ٧,٣٨	٤٥,٣٣ ± ١١,٣٢	٢١,٣٣ ± ٤,٣٩	٤٣,٦٧ ± ٥,٥٠	٣٥,١١ ± ٩,٢٥	٤٢,٥٦ ± ٥,١٦
	٤-٦	٤٧,٣٠ ± ٩,٢٣	٤٢,٠١ ± ١٠,٧٥	٢٠,٤٩ ± ٣,٩٦	٤٥,٤٩ ± ٩,٣٣	٤٢,٣٩ ± ٩,٦٢	٤٤,٧٥ ± ٦,٥٩
	٧-٩	٤٨,٦١ ± ٨,٠٧	٤٧,٠٨ ± ١٠,٤٦	٢١,٨٨ ± ٣,٩٠	٤٤,٦٩ ± ٨,٤٦	٤٢,٠٨ ± ٨,٦٨	٤٥,٩٤ ± ٤,٢٢
	١٠+	٤٤,٤٥ ± ٩,٧٠	٤٥,٨٤ ± ٨,٠٣	٢٠,٣٨ ± ٣,٧٤	٤١,٨٨ ± ٨,٧٣	٤١,٦٧ ± ١٥,٤٩	٤٢,٣٤ ± ٦,٣٣
	f. test	٢,١٠٨	١,٣٥٧	٠,٦٤٥	١,٣٧٩	١,٩٢٨	١,٤٦١
	p value	٠,١٠٤	٠,٢٦١	٠,٥٨٨	٠,١٨٦	٠,١٣٠	٠,٢٣٠

Discussion

Recovery from mental illness is a multidimensional and a complex process^(٢٦). Community integration is significant in the recovery process and is an indicator of patient well-being. During the recovery process, the patient seeks to give up his illness and create his personal identity to regain their meaning in life and to be socially effective in the community^(٢٧). The present study aimed to assess the levels of community integration and mental health recovery among patients with psychiatric disorders and explore the association between both of them.

The findings of the current study revealed that the majority of the studied patients had poor level of community integration in total score and in all subscales (physical, social, psychological and independence). Really, there are many factors that may lead to poor community integration, among these factors are poor social and communication skills in the patients which are part from illness process, prevailing stigma and negative attitude toward people with mental illness,

lack of adequate support from all patients' surroundings, and prolonged and recurrent hospitalization which may affect negatively on patient's ability to face the community

and live independently within it. Research revealed that despite the importance of community integration, in most societies, persons with mental disorders are still marginalized. Their social networks are small and provide a low level of social support, and because of social stigma, they have limited opportunities for employment, housing, and education.^(٢٨, ٢٩).

Moreover, previous community integration studies have identified predictors of community integration of persons with mental disorders, among these factors is social functioning of the patients.^(٣٠, ٣١). Unfortunately, social skills among psychotic patients are very deteriorated and may be totally lost because the early age of onset of the diseases and its negative effect on the quantity and quality of social network of the patients and their abilities to be assertive. These factors hinder patients' community integration and act as an obstacle to fulfil their sense of belonging and connectedness.

The present findings go in line with some research that showed evidence that patients' level of community integration was clearly

lower than others ^(14, 32) On the same line, Cabral, et al (2018) reported that community integration levels were significantly lower in people with mental health difficulties than in the general population ⁽⁹⁾. On the other hand, other studies have found that the level of social integration in persons with mental disorders is not lower compared to the general population and non-disabled persons ⁽³³⁾ or that there is little, if any, differences⁽³⁴⁾.

The second main finding of the present study is that almost all studied patients had poor level of mental health recovery in total score and subscales also. This result could be explained by poor level of community integration among patients that is mentioned before. The literature indicated that, community participation by adults with mental illnesses was identified as a predictor of outcomes such as recovery, quality of life, and a meaningful life ⁽³⁵⁾. Kim and Lee (2012) stressed that sense of belonging, including community integration, should be promoted as an intervention against self-stigma in people with a diagnosis of schizophrenia living in the community ⁽³⁶⁾. Considering that self-stigma is closely associated with quality of life and recovery in people with mental health difficulties ⁽³⁷⁾.

When investigating relationship between community integration and recovery, strong

positive correlations were found between them. In other words, community integration affecting patient's recovery and vice versa. This is consistent with what is commonly known about role of patients' recovery on community integration. Some researchers believed that recovery has concrete social implications which are expressed in community integration, including redefining oneself beyond psychiatric illness and reintegrating into valued roles in society ^(37,38). However, other researchers stress that the connection between recovery and community integration is only correlative and not causal, so that it has not been determined whether recovery contributes to community integration or vice versa ^(39,40). On the same line, Lloyd et al., (2010) reported a relatively weak correlation between community integration and recovery ⁽⁴¹⁾.

Moreover, in the present study, regression analysis was done to analyze the impact of community integration variables on patients' recovery. Social integration was above all, a significant predictor of patients' recovery. This finding signifies the importance of building and maintaining social relationships with other members in the community, presence of social network and support system to be available to the patients and the importance of increasing socialization among

psychotic patients. These factors will help patients to be more socialized and promote their recovery. A previous study was conducted by Lee & Seo (٢٠٢٠) about community integration of persons with mental disorders compared with the general population, found that a small social network in persons with mental disorders becoming chronic with lower social functioning which means that they are socially isolated and faced challenges in obtaining the social support needed to live in their communities. Such isolation poses the risk that their psychopathology will deteriorate ^(٤٢). Social integration is the most important predictor of quality of life among psychotic patients ^(٤٣,٤٤). Therefore, low social integration is seen as a challenge to overcome for their quality of life and recovery.

Another important finding in the current study is the presence of statistically significant relationship between some of the socio-demographic characteristics of psychotic patients and their levels of community integration and recovery. These are age, sex and educational levels. More specifically, young age patients had higher level of community integration and recovery. The possible explanation for this may be that young age patients may be newly diagnosed with mental illness and still had no chronicity.

Subsequently, recurrent hospitalization is not the case for them which means that they lived in the community more time and maintain their integration within social network which enhanced their recovery. This justification is consistent with Lee & Seo (٢٠٢٠) who reported that age had a significant effect on social network size and psychological integration in psychotic patients in their study ^(٤٢).

Nevertheless, research findings on the relationship between age and community integration are inconsistent. While many studies reported no associations between age and community integration of persons with mental disorders ^(٤٥). Others reported evidence of their relationship ^(٤٦, ٤٧).

The second socio-demographic variable that has a significant relationship is sex, in which female patients had higher level of community integration and recovery. Basically, it is well known that age of onset of mental illness among female patients is later than in male patients. This is giving opportunity for female patients to develop their personalities, choose career, build relationship with different personnel and being well integrated in the community which consequently affect positively their recovery. However, this result is not consistent with results of previous studies which indicated that gender was not

significantly associated with community integration^(33,34).

Lastly, university educated patients had a high significant level in community integration and recovery. This result could be explained by the effect of higher education on person's ability to be independent, take his own decisions, solve problems and be initiative in everything. In addition, highly educated patients may have ability to form satisfying relationships with others and use of community resources which help in their community integration and recovery. This explanation goes in line with Lee & Seo (2020) they reported a positive effect of higher education on physical integration and social network size in persons with a mental disorder. Other studies, however, argued that at a significant level, the educational level does not predict community integration^(33, 34, 35).

Conclusions

The data obtained from the current research confirmed that, the studied patients had poor community integration and mental health recovery. Community integration and recovery are correlated and influencing each other. Furthermore, social community integration is the first main predictor of recovery among psychotic patients.

Recommendation

Based on the findings of the present study the following recommendation was suggested

- 1- Community Mental Health Nurses should continuously evaluate the level of community integration among the patients and develop intervention programs to improve it.
- 2- Mental health recovery in patients with psychiatric disorders need to be assessed regularly and enhanced through increasing personal confidence and hope among the patients and expand their community integration.
- 3- Continuous efforts are needed to improve social community integration among the patients via applying different programs for social skills training and assertiveness skills that strengthen patient's ability to form relationships with others in the community and subsequently enhance their recovery.

References

1. World Health Organization (WHO). Relatório sobre a saúde no mundo : Nova Conceção, Nova Esperança. Geneva: World Health Organization. Retrieved from <http://www.abebe.org.br/wp-content/uploads/oms2001.pdf>. (2001).
2. Im H, & Park J H. Analysis of priorities associated with community integration process of the mentally disabled. Social

- Welfare Policy and Practice, 2018; 4(1), 0-38.
3. Bond. GR, Salyers. MP, Rollins. AL, Rapp. CA, Zippel. AM. How evidence based practices contribute to community integration. Community Ment Hlt J .2004; 40:069-088.
4. Nelson, G., Lord, J., & Ochocka, J. Empowerment and mental health in community: Narratives of psychiatric consumer/survivors. Journal of Community & Applied Social Psychology. 2001; 11(2), 120-142. doi: 10.1002/casp.719
5. Weiner, A., Roe, D., Mashiach-Eizenberg, M., Baloush-Kleinman, V., Maoz, H., & Yanos, P. T. Housing model for persons with serious mental illness moderates the relation between loneliness and quality of life. Community Mental Health Journal. 2010; 46(4), 389-397. <https://doi.org/10.1007/s10097-009-9279-3>.
6. Wong , Y. L., & Solomon, P. L. Community integration of persons with psychiatric disabilities in supportive independent housing: A conceptual model and methodological considerations. Mental Health Services Research. 2002; 4, 13-28.
7. Cabral, J., Barreto Carvalho, C., da Motta, C., & Sousa, M. Validation of the community integration scale for adults with psychiatric disorders (CIS-APP-34). Community Mental Health Journal. 2018; 04, 673-681. Retrived from <https://doi.org/10.1007/s10097-017-0228-2>
8. Choi, Y. J. Developing the self-reporting scale of community integration for the person with psychiatric disabilities. Journal of Rehabilitation Research. 2012; 16, 160-192
9. Lee, M. , and Seo, M . Community Integration of Persons with Mental Disorders Compared with the General Population Int J Environ Res. Public Health .2020; 17, 1096; doi:10.3390/ijerph17051096.
10. Gulcur, L., Tsemberis, S., Stefancic, A., Greenwood, R.M. Community integration of adults with psychiatric disabilities and histories of homelessness. Community Mental Health J. 2007; 43, 211-228.
11. Townley, G.; Kloos, B. Examining the psychological sense of community for individuals with serious mental illness residing in supported housing environments. Community Mental Health J. 2011; 47, 436-446.
12. Min, S.Y. The process of predictors of community integration among persons

- with mental illnesses. *Mental Health Soc. Work* 2009; 33, 36–68.
13. Pahwa, R., Bromley, E., Brekke, B., Gabrielian, S., Braslow, J.T., Brekke, J.S. Relationship of community integration of persons with severe mental illness and mental health service intensity. *Psychiatr. Serv.* 2014; 65, 822–825.
 14. Cohen, C. I., & Iqbal, M. Longitudinal study of remission among older adults with schizophrenia spectrum disorder. *American Journal of Geriatric Psychiatry*, 2014; 22, 400–408.
 15. Griffen, J., Hanks, R., & Meachen, S. J. The reliability and validity of the community integration measure in persons with traumatic brain injury. *Rehabilitation Psychology*, 2010; 55, 292–297.
 16. Aubry, T., Flynn, R.J., Virley, B., Neri, J. Social role valorization in community mental health housing: Does it contribute to the community integration and life satisfaction of people with psychiatric disabilities? *J. Community Psychol.* 2013; 41, 218–230.
 17. Cabral, J., Barreto Carvalho, C., da Motta, C., & Sousa, M. Characterization and predictors of community integration of people with psychiatric problems: Comparisons with the general population. *International Scholarly and Scientific Research & Innovation*, 2010; 9, 1748–1757.
 18. Salzer, M., Brusilovskiy, E., Prvu-Bettger, J, Kottsieper, P. Measuring community participation of adults with psychiatric disabilities: reliability of two modes of data collection. *Epub*, 2014; 09(2):211–219. doi: 10.1037/a0036002.
 19. Slade M, Leamy M, Bacon F, Janosik M, Le Boutillier C, Williams JJ, Bird V. International differences in understanding recovery: systematic review. *Epidemiol Psychiatr Serv.* 2012; 21:303–64. 8.
 20. Chambers E, Cook S, Thake A, Foster A, Shaw S, Hutten R, Parry G, Ricketts T. The self-management of longer-term depression: learning from the patient, a qualitative study. *BMC Psychiatry*. 2010;10:172
 21. Jacob K. S. Recovery model of mental illness: a complementary approach to psychiatric care. *Indian journal of psychological medicine*, 2010; 37(2), 117–119. <https://doi.org/10.4103/0.203-7176,100600>.
 22. Bonney, S, Stickley T. Recovery and mental health: A review of the British literature. *J Psychiatr Ment Health Nurs.* 2008;10:140–53.
 23. Ramon, S, Healy, B, Renouf, N. Recovery from mental illness as an

- emergent concept and practice in Australia and the UK. *Int J Soc Psychiatry*. 2007; 53:108–22.
24. Carvalho, T, Mendonça, L, Massaranduba, W, Fontenele, S, Cabral Barreto, A. Análise morfométrica da microbacia do rio granjeiro, crato/ce. IV Encontro Universitário da UFC no Cariri – 2012.
25. Corrigan, P. W., Giffort, D., Rashid, F., Leary, M., & Okeke, I. (1999). Recovery as a psychological construct. *Community Mental Health Journal*. 35(3), 231–239.
26. Padgett, DK, Tiderington, E, Tran Smith, B, Derejko, K-S. Complex recovery: understanding the lives of formerly homeless adults with complex needs. *J Soc Distress Homeless*. 2016; 25:60–70.
27. Chan, KK, Mak, WW. The mediating role of self-stigma and unmet needs on the recovery of people with schizophrenia living in the community. *Qual Life Res*. 2014; 23(9): 2009–18.
28. Lee, K.J. A Study on the Wage Discrimination Effect of People with Psychiatric Disabilities in the Labour Market. *Disabil. Employ*. 2006; 16, 101–117. 11.
29. Seo, M.K.; Kim, C.N.; Rlee, M.K. The National Human Rights Reports and the Promotion of the Mentally Disabled; National Human Rights Commission of Korea: Seoul, Korea, 2008.
30. Gulcur, L., Tsemberis, S., Stefancic, A., Greenwood, R.M. Community integration of adults with psychiatric disabilities and histories of homelessness. *Community Mental Health J*. 2007; 43, 211–228.
31. Townley, G.; Kloos, B. Examining the psychological sense of community for individuals with serious mental illness residing in supported housing environments. *Community Mental Health J*. 2011; 47, 436–446.
32. Byrne, T., Prvu Bettger, J., Brusilovskiy, E., Wong, Y.L.I., Metraux, S., Salzer, M.S. Comparing neighborhoods of adults with serious mental illness and of the general population: Research implications. *Psychiatr. Serv*. 2013; 64, 782–788.
33. Yanos, P.T., Stefancic, A., Tsemberis, S. Psychological community integration among people with psychiatric disabilities and nondisabled community members. *J. Community Psychol*. 2011; 39, 390–401.
34. Yanos, P.T., Stefancic, A., Tsemberis, S. Objective community integration of mental health consumers living in supported housing and of others in the community. *Psychiatr Serv*. 2012; 63, 438–444.

٣٥. Kaplan., K., Salzer, M. S., & Brusilovskiy., E. Community participation as a predictor of recovery-oriented outcomes among emerging and mature adults with mental illnesses. *Psychiatric Rehabilitation Journal*. ٢٠١٢; ٣٥, ٢١٩–٢٢٩. <https://doi.org/10.2970/35,3,2012,219,229>
٣٦. Kim., M. Y., & Lee, I. J. The effect of program environment and social support on the hope of people with mental illness. *Mental Health and Social Work*. ٢٠١٢ ٤٠, ٢٦٣–٢٩١.
٣٧. Bond., GR, Salyers., MP, Rollins AL, et al. How evidence-based practices contribute to community integration. *Community Ment Health J* .٢٠٠٤; ٤٠:٥٦٩-٥٨٨.
٣٨. Tondora., J, Davidson., L. Practice guidelines for recovery-oriented behavioral health care. Connecticut: Connecticut Department of Mental Health and Addiction Services. ٢٠٠٦.
٣٩. Burns-Lynch., B, Brusilovskiy., E, Salzer., MS. An empirical study of the relationship between community participation, recovery, and quality of life of individuals with serious mental illnesses. *Isr J Psychiatry Relat Sci* .٢٠١٦; ٥٣:٤٦-٥٥.
٤٠. Brown LD, Shepherd MD, Merkle EC, et al. Understanding how participation in a consumer-run organization relates to recovery. *Am J Community Psychol*. ٢٠٠٨;٤٢:١٦٧-١٧٨.
٤١. Lloyd, C., King, R., & Moore, L. Subjective and objective indicators of recovery in severe mental illness: A cross-sectional study. *International Journal of Social Psychiatry*. ٢٠١٠; ٥٦, ٢٢٠–٢٢٩. <https://doi.org/10.1177/0020717909364003>
٤٢. Lee., M, Seo. , M. Community Integration of Persons with Mental Disorders Compared with the General Population. *International Journal of Environmental Research and Public Health*. ٢٠٢٠; ١٧, ١٥٩٦; doi:10.3390/ijerph1705096
٤٣. Eklund., M.; Hansson., L. Social network among people with persistent mental illness: Associations with socio-demographic, clinical and health-related factors. *Int. J. Soc. Psychiatry* ٢٠٠٧; ٥٣, ٢٩٣–٣٠٥.
٤٤. Cechnicki., A.; Wojciechowska., A.; Valdez., M. The social network and the quality of life of people suffering from schizophrenia seven years after the first hospitalization. *Arch. Psychiatry Psychotherapy*. ٢٠٠٨; ١٠, ٣١–٣٨.
٤٥. Baumgartner, J.N.; Herman, D.B. Community integration of formerly homeless men and

women with severe mental illness after hospital discharge. Psychiatr Serv. ٢٠١٢; ٦٣, ٤٣٥–٤٣٧.

٤٦. Townley, G.; Miller, H.; Kloos, B. A little goes a long way: The impact of distal social support on community integration and recovery of individuals with psychiatric disabilities. Am. J. Community Psychol. ٢٠١٣; ٥٢, ٨٤–٩٦.

٤٧. Choi, H.C. A Study on the factors affecting community integration of persons with mental illness at home. J. Soc. Sci. ٢٠١٣; ٣٩, ١٥١–١٧٧.

Effect of Social Skills Enhancement Training Program on Negative Symptoms among Patients with Schizophrenia

Sara Abdallah Abdelgelil ^١, Ayat Saif Elyazal ^٢, Ahmed Abel-Rahman Mubarak ^٣, Zebede Abdelgawad Elsherif ^٤

^١Assistant lecturer, Psychiatric and Mental Health Nursing, Faculty of Nursing, Tanta University, Egypt,

^٢Assistant Professor of Psychiatric/ Mental Health Nursing, Faculty of Nursing, Tanta University, Egypt

^٣Professor of Neuro- Psychiatry, Faculty of Medicine, Tanta University, Egypt^(١)

^٤Assistant Professor of Psychiatric/ Mental Health Nursing, Faculty of Nursing, Tanta University, Egypt

Corresponding Author: z.alsherif@gmail.com

Abstract

Negative symptoms in schizophrenia are commonly associated with reductions and difficulties in patients' social skills. Fortunately, many psychosocial interventions recommended for their improvement. **The aim of the study** was to evaluate the effect of social skills enhancement training program on negative symptoms among patients with schizophrenia. **Subjects:** a convenience sample of ٦٠ patients with schizophrenia who attended both inpatient department and the outpatient clinic, of department of neuropsychiatry Tanta University hospital. **Study design:** Quasi-experimental research design was utilized. **Settings:** department of neuropsychiatry Tanta University Hospital. **Study tools:** Two tools were used: **tool ١** is "Scale for the Assessment of Negative Symptoms (SANS)" and **Tool ٢** is "Social skills assessment screening scale". **Results:** there were reductions in the mean scores of negative symptoms domains and a significant increase in the mean scores of social skills domains, immediately and at one month after the program in comparison with before. There was a highly statistical significant negative correlation between levels of social skills and levels of negative symptoms **Conclusions:** it can be concluded that, the social skills enhancement training program was effective for patients with schizophrenia and brought a significant decrease in the severity of negative symptoms, and an improvement in their social skills in comparison to before the program. **Recommendations:** the researcher recommended that social skills training program should be integrated in the psychiatric hospitals' protocol of care in conjunction with pharmacological therapy for going beyond the traditional treatment process of patients with schizophrenia.

Key words: Negative Symptoms , Patients with Schizophrenia, Social Skills

training program.

Introduction

Schizophrenia is considered as one of the top ten common chronic devastating diseases worldwide ^(١). It is one of the major psychotic illnesses in Egypt ^(٢). Schizophrenia is characterized by alterations in thinking, perception, affect, and social behavior ^(٣). It commonly arises in adolescence and young adulthood. It may be episodic or continuous; some patients may have inter-episode restoration of function, on the other hand some patients may show treatment resistance, with chronic negative symptoms and chronic life impairment ^(٤). Symptoms of schizophrenia can be conceptualized into positive, cognitive and negative symptoms. Initially, positive symptoms reflect excess or distortion of normal functions including delusions and hallucinations and this is the psychotic dimension of schizophrenia, whereas the cognitive symptoms include dysfunctions in working memory, attention, visual and verbal learning with deficits in reasoning, planning, abstract thinking and problem solving ^(٥,٦).

Negative symptoms of schizophrenia reflect a reduction or loss in normal healthy

functions, such as affective flattening, anhedonia, alogia, avolition, and asociality; these symptoms tend to continue as residual symptoms after treatment, ^(٧,٨) and can reduce patient's motivation for enjoying social activities and interactions with others ^(٩). Patients also have difficulties recognizing people they have seen before, identifying the emotional expressions of others, problems in establishing, and maintaining relationships, and inability to resume or perform their social roles ^(١٠,١١).

Although antipsychotic medications are actually basic in treating schizophrenia and greatly reduce the severity of positive symptoms, they have poor effect on negative symptoms and patient social skills. Hence, new intervention approaches were developed for improving patient condition, one of these interventions is social skill training ^(١٢,١٣,١٤).

Social skills are the behaviors that help in interacting and communicating successfully in social situations. They involve the verbal and non-verbal abilities that help in understanding others, expression and exchange of information, attitudes, opinions, and feelings ^(١٥). They are essential for

affiliative interactions and for building and maintaining meaningful relationships^(١٤).

Social skills training will help patients to overcome deficits in social skills and provide them with the important skills to be able to deal proficiently with daily hassles, solve life challenges and stressors triggering relapse and promote their social compensation. Moreover, these protective effects can help patients to stabilize their illness, improve medication adherence, and promote progress toward recovery^(١٥).

Social skills training can help patients to learn many skills such as listening skills; requesting skills, refusal skills, skills of expressing positive as well as negative emotions, apologizing skills, and initiation, maintenance and termination skills of conversation^(١٦). The basic premise behind teaching these skills is that, the complex behaviors are analyzed and broken down into a smaller set of elements that are trained using various behavioral techniques. These techniques include skill specification, instructions, modeling, feedback, verbal reinforcement, generalization training and homework^(١٧).

Recent related studies that are concerned with evaluating the effect of social skills training on negative symptoms, showed that it can reduce negative symptoms of

schizophrenia and is associated with a lot of outcomes including independent living skills and increased patients' participation in vocational and recreational activities^(١٨-٢٠), and significant improvement from base line levels on conversation and assertiveness skill to the general social performance^(٢١).

The significance of this study comes from that negative symptoms of schizophrenia are commonly associated with reductions in the necessary skills required by patients for satisfaction of their daily living activities. They may have difficulty starting a conversation, speak in a low monotonous voice, or fail to establish eye contact so helping those patients can enhance their community adjustment so the role of the psychiatric nurses is to focus on enhancing patients' social skills as they are in an excellent position to assess and implement the appropriate interventions because they have a great contact with patients and have knowledge and concern about them.

Aim of the study

The aim of the study was to evaluate the effect of social skills enhancement training program on negative symptoms among patients with schizophrenia.

Research question

What was the effect of social skills enhancement training program on negative

symptoms among patients with schizophrenia?

Research hypothesis

Negative symptoms of patients with schizophrenia are expected to be improved after implementation of social skills enhancement training program.

Subjects and Method

Research design

Quasi-experimental research design was used in the study.

Setting

The present study was conducted at the department of Neuropsychiatry Tanta University Hospital and its outpatient clinic. The capacity of the psychiatric department was ٣١ beds divided into two wards for men (١٧ beds) and two wards for women (١٤ beds). The outpatient clinic worked ٤ days/week and served from ١٠-١٤ patients with schizophrenia/week and this clinic was run by consultant psychiatrists supported by psychiatric nurses.

Subjects

A convenient sample of ٦٠ patients diagnosed with schizophrenia according to DSM-٥ diagnosis. They were divided equally into two groups (٣٠ patients in each group). The first group was the study group which was involved into the social skills enhancement training program and the

second group was the control group which received the treatment as usual care. Both groups received their regular psychotropic medications. The subjects in both groups had the following **inclusion criteria**:-

- Aged from ١٨ years and above.
- Both sexes.
- Patients diagnosed with schizophrenia based on Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (with a duration of illness \geq ٧ years). Those patients will be included according to their negative symptoms which will be determined according to **Andreasen** scale for the assessment of negative symptoms.

Exclusion criteria:-

- Patients with any psychiatric morbidity particularly, intellectual disability and substance use disorder.

Tools of the study

The data was collected by using the following two tools:-

Tool I: Scale for the Assessment of Negative Symptoms (SANS):- it included two parts:-

Part one: Socio-demographic and clinical data sheet:- It was developed by the researcher to elicit socio-demographic characteristics of patients such as "age, sex, marital status, level of education, occupation, place of residence, co-habitation

and income". In addition to, patient clinical data as "age at disease onset, duration of the illness, and number of previous psychiatric hospitalizations and type of hospital admission".

Part two: Scale for the Assessment of Negative Symptoms (SANS):- It was originally developed by **Andreasen N (١٩٨٤)** ^(٢٢). This scale facilitated the evaluation of the five negative symptoms frequently found in schizophrenia based on observations and interviews with patients. It is composed of ٢٥ items, each item on this scale is to be rated on a five point scale :(٠) absent negative symptoms , (١) questionable negative symptoms , (٢) mild negative symptoms, (٣) moderate negative symptoms , (٤) marked negative symptoms , & (٥) severe negative symptoms, where higher scores mean severe negative symptoms.

The scale is divided into five subscales as follows:-

١. Affective flattening or blunting includes ٨ items, such as unchanging facial expression.
٢. Alogia includes ٥ items, such as poverty of speech.
٣. Avolition /Apathy include ٤ items, such as grooming and hygiene.
٤. Anhedonia/Asociality includes ٥ items, such as recreational interests and activities.

٥. Attention includes ٣ items, such as social inattentiveness.

Scoring system

The total score of the overall items was summed to determine the severity of negative symptoms with the higher scores indicating severe negative symptoms. Total score ranged from ٠-١٢٥ where the maximum point was ١٢٥ and the minimum was ٠ and classified as following:-

- Mild negative symptoms (< ٥٠ %) (٠-٦٢)
- Moderate negative symptoms (٥٠-٧٥ %) (٦٣-٩٣)
- Severe negative symptoms (> ٧٥ %) (٩٤-١٢٥)

Tool II: Social Skills Assessment Screening

Scale:- This scale was developed by **Bhola P et al (٢٠١٦)** ^(٢٣) to screen for social skills deficits among patients based on observations and interviews with them. It is composed of ٢٠ items, each item on this scale is rated on a ٣ point scale where (٠) inadequate social skills, (١) average social skills & (٢) adequate social skills. This scale is divided into three subscales to facilitate social skills evaluation as follows: -

١. Non-verbal behavior and communication include ٤ items, such as grooming and appearance.

٦. Verbal communication include ٦ items, such as the ability to great other people.
٧. Social behavior includes ١٠ items, such as understanding social situations-formal and informal.

Scoring system

The total score of the scale was obtained by adding the scores for each item, with lower scores indicated greater social skills deficits. Total score ranged from ٠-٤٠ where the maximum point was ٤٠ and the minimum was ٠ and classified as following:-

- Severe social skills deficit (<٥٠ %) (٠-١٩)
- Moderate social skills deficit (٥٠-٧٥ %) (٢٠-٣٠)
- Mild social skills deficit (>٧٠ %) (٣١-٤٠).

Method

- ١) An official letter was addressed from the dean of the faculty of nursing to the head of the psychiatric department of Tanta University Hospital to have their permission and cooperation for data collection.
- ٢) **Ethical considerations**
 - Approval from Ethical Committee in the faculty of nursing was obtained.
 - Informed written consent was obtained from the participants after explanation of the study purpose.

- The participants were reassured about confidentiality of their information and it would be used for the research purpose only.
 - Respecting the right of the participants to withdraw at any time during the data collection period.
 - The nature of the study inflicted no harm on the patients.
- ٣) The study tools were translated into Arabic language by the researcher and were tested for internal validity by a jury composed of ٥ experts in both psychiatric nursing and psychiatric medical fields. The required corrections and modifications were carried out accordingly.
 - ٤) The study tools were tested for reliability by using Cronbach's alpha test and found to be ٠,٩١٢, and ٠,٨٧٣ respectively for tool I (part ٢) and tool II which represented highly reliable tools.
 - ٥) A pilot study was carried out on ten percent of the study subjects (٦ patients), who were fulfilling the inclusion criteria, to ascertain the clarity and applicability of the study tools, and to identify any obstacles that might be encountered during the data collection period. Those subjects were excluded later from the main study sample. According to the results of the pilot study, the tools were clear and applicable and no modifications were done.

- ٦) The actual study was divided into four phases;

Phase one: Assessment phase

- ١) The researcher reviewed all inpatients' records in order to choose those who met the inclusion criteria. The total number of the study sample was ٦٠ patients, and they were divided equally into control and study groups (٣٠ patients for each group).
- ٢) The selected patients who met the inclusion criteria were asked to participate in the study after establishing rapport and trusting relationship with them and explaining the aim of the study.
- ٣) The selected patients undergone the pre-test by applying the two tools and interviewed individually. Each interview with patients ranged from ٤٠-٦٠ minutes according to the patients' ability to understand and talk.
- ٤) The data was collected through various techniques such as interviews, observation of patients' behavior in the ward.
- ٥) Study tools were kept anonymously by using code numbers.

Phase two: Planning phase

- ١) The content of the social skills training program was developed by the researchers based on reviewing the recent related literatures ^(١١, ٢٤-٢٦). It was translated into a simplified Arabic language by the

researchers to ascertain its appropriateness and applicability.

- ٢) The study group was divided into (١٠) subgroups. Each subgroup was homogenous in terms of sex and contained ٣ patients.
- ٣) The training was divided into (٨) sessions, which necessitated patients' attendance at all the sessions, each session lasting from (١:٣٠- ٢) hours, with each session containing (٣) patients; ٢ sessions per month over a period of ٧ months.
- ٤) The researcher prepared the needed materials for conducting the program such as the equipment which could be used in personal hygiene such as soaps, and hair brushes, tooth brushes and tooth paste. Also, materials used in writing, drawing, and coloring e.g. pens, papers, sketchbooks, and coloring pencils, and the materials for sharing activities in the group, such as cards, snake and ladder games and newspapers, were also prepared.

Phase three: Implementation phase

- Social skills enhancement training program was implemented by covering the following eight sessions in an orderly way: with each session had a general objective. The training sessions which contained complex skills and addressed the conversational skills, active listening and skills of assertiveness, were

divided into two sessions.

- Patients' individual differences, levels of understanding, willingness and response were also taken into consideration during the sessions for better skills acquisition.
- Before each training session, patients were well informed about the rules of the group, e.g. confidentiality and honesty and what to expect from them regarding their own roles, e.g. listening attentively to each other, there were no right or wrong answers, and everyone had an equal chance to participate. Also, the subgroups were arranged in a circular shape.
- The information of the program was presented in the form of a lecture prepared by the researcher in a simplified Arabic language interwoven with group discussion. The training included videos, real life scenarios, demonstrated situations by the researcher and then patients were asked to re-demonstrate under the researcher observation.
- In the sessions, the researcher was the initiator, provider of the information, and the encourager for the patients. He also acted as the group leader who operated as a facilitator, teacher and trainer.
- The training sessions were proceeded in the following way, the researcher clarified the session topic and its planned activities for

the first ١٠ minutes. Later ٦٠ minutes were utilized for completing the session work; divided by having a break for ٢٠ minutes and the later remaining ٢٠ minutes were for summarization, soliciting feedback, thanking patients, and reminding them about the time of the next session.

- Each training session was started with summary about the previous session.
- In the sessions, role-play rehearsals by group members were always observed, immediately followed by positive feedback about what specifically the patient did well. The given corrective feedback focused on patients' demonstrated behaviors, in the form of suggestions for how to do the skill more effectively in the next time. As well, patients were reinforced by gaining recognition and compliments, and receiving tangible reinforces in the form of toffee, biscuits, juices, bananas and marshmallows.

- Sequence of each session was as follows:-

Session(١)Introductory session

- The researcher and the patients would get to know each other and the researcher would explain the purpose, content and processes of the program to the patients and nursing staff to gain their support and co-operation.
- As well, the researcher presented an introduction to the concept of social skills, and their importance in life.

Session (٢)

- **General objective of the session:-**the studied patients would acknowledge and apply the verbal and non-verbal components needed for conversations for mixing and forming friendships with others in an appropriate way.

-Exercise ١:-The patients were asked individually to act some real life situations in front of the other patients to strengthen their conversational abilities such as how to start and end a conversation with a new patient who recently entered the ward and how to converse with other patients during the meal time.

-Exercise ٢:-The patients were shown some pictures of some positions encountered during conversations and patients were asked to determine whether these positions were correct or wrong.

-Exercise ٣:- The researcher presented a sentence to the patients which were “Thank you for your kindness and your welcomes”, and then patients were encouraged to try saying this sentence in different tones: anger, happiness, and boredom.

-Exercise ٤:-This exercise consisted of asking patients to demonstrate how to use the appropriate body language for showing the emotions of happiness and sadness.

Session (٣)

- **General objective of the session:** the studied patients would be able to acknowledge the importance of active listening and how to apply its basic components (verbal & non-verbal) in order to comprehend and analyze others' speech to understand and empathize with their feelings.

-Exercise ١:- A group member was asked to speak in any topic for two minutes, while the other group members remained silent and actively listened to him/her and so on till the other group members performed the same as the speaker.

-Exercise ٢:- The group was shown videos that contained a group of people who were happy due to their success. After then, patients were asked to identify the feelings after actively listening to these videos.

-Exercise ٣:-Recognizing facial expressions by showing patients pictures of people experiencing different emotions; then they were asked to recognize and describe these emotions. Through group discussion, patients were encouraged to explain why those people experienced these emotions.

Session(٤)

- **General objective of the session:** the studied patients would be able to recognize and apply skills of assertiveness.

-Exercise ١:-The researcher presented

patients with some situations and encouraged them to act. For example, how to express their feelings if their keys were lost and searched for too much but did not find them and how to express their feelings as "if someone surprised them with a cadeau". The task of these situations was to teach patients to express freely their emotions immediately in the situation.

-Exercise ٧:-The researcher encouraged the use of a paper and a pen and allowed patients to express their feelings through writing, e.g., I feel sad when....., I feel happy when.....etc. or expressing feelings through drawing.

-Exercise ٨:-If the patient could not write or draw, the researcher considered the alternative of helping him/her to choose the facial expression which represented his/her feelings and congruent with the inner felt emotions.

-Exercise ٩:-The researcher presented some life situations to the patients and allowed them to practice submitting assertive requests to others. For example, how to ask the person talking with you to raise his/her voice a little so that you could hear it clearly?, and what would you do if you bought a television or a refrigerator and found it defective?.

Session (٥)

- **General objective of the session:** the studied patients would be able to apply the skills of making apologies.

-Exercise ١: This exercise consisted of asking patients the question of "Was there anyone you would like to apologize to now?". The researcher presented this question to each patient in the group for a few minutes, and then they were asked to write the situation and how to apologize in it.

-Exercise ٢: This exercise intended to train the studied patients on how to apologize to others through presenting the group members with two real life situations. The duration of each is ٥ minutes. Through group discussion, the researcher tried to teach patients on how to present an effective apology. For example, how to apologize to your friend for being late for the deadline? and how to apologize for shedding water involuntarily on someone sitting next to you?

Session (٦)

- **General objective of the session:** the studied patients would be able to choose and participate in activities with others from a list of recreational activities and share freely day to day experiences along these activities.

-Exercise ٣: in this exercise, the researcher allowed patients to think critically

about a wide range of group activities they could share with each other and also gave them the autonomy in choosing what suited them from a list of activities, such as painting and coloring, playing cards, snake and ladder game and reading newspapers.

-Exercise ٧: The group was shown a table of the daily routine. After then, patients were asked to talk about their day to day experiences in front of the group members with giving the opportunity to the other patients to speak as well, for example (when did he/she sleep, when did he/she wake up, when did he/she take the breakfast, when did he/she sit alone, when did he/she go out, when did he/she go to work, what did he/she do in their leisure time, when did he/she watch TV etc.) until the day ended. This gave patients the chance in sharing day to day experiences freely with others.

Session (٧)

- **General objective of the session:** the studied patients would be able to identify how to initiate and maintain personal hygiene for better grooming and appearance.
- Exercise ١: This exercise consisted of videos on personal hygiene and the studied patients' task was to recognize, how to perform hygiene, and finally applying this video step by step within the group.

- Exercise ٧: This exercise consisted of pictures on personal hygiene. These pictures were presented to each patient in the group for few minutes, then they were asked to perform what they saw in these pictures after giving them the needed equipment from the soap, hair brushes, tooth brush and toothpaste.

Session (٨)

- This session included a revision and a summary over all the training sessions.
- The researcher took verbal feedback from the patients about their experience in the program and clarified any vagueness concerning the previous sessions.
- Before termination of the sessions, the researcher emphasized the significance of follow-up for all patients (control and study) one month after the training program.

Phase four: Evaluation phase

- Evaluation of the training was done by reapplying the study tools (tool I & tool II) that was applied before on patients involved in control group and also on patients who were involved in the study group to ensure that the program had an effect on enhancing the negative symptoms and social skills in schizophrenia;
- ١) First evaluation was done immediately after eventual application of the training program (post-test ١).

- ٢) After the post-test by one month later, the second evaluation was performed by using the same tools in order to assess the effect of the training on negative symptoms and social skills (post-test ٢).
- Data of the study was collected in the period between December ٢٠١٩ to August ٢٠٢٠.

Statistical Analysis:-

The collected data were organized, tabulated and statistically analyzed using SPSS software statistical computer package version ٢٦. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison was done using Chi-square test (χ^2). For comparison between means of two variables in a group, paired samples t-test was used. For comparison between means for variables during three periods of intervention in a group, or for more than two variables, the F-value of analysis of variance (ANOVA) was calculated.

Correlation between variables was evaluated using Pearson and Spearman's correlation coefficient r. A significance was adopted at $P < 0,05$ for interpretation of results of tests of significance (*). Also, a highly significance was adopted at $P < 0,01$ for interpretation of results of tests of significance (**).

Results

Table (١) represents the socio-demographic characteristics of the studied patients. The table shows that, as regard to age, it is observed that nearly one quarter (٢٦,٧%) of patients in the control group, were aged between ٢٠ to less than ٣٠ years and also the same percentage (٢٦,٧%) of patients were aged fifty years or more with a mean age $37,03 \pm 13,993$ compared to ٤٠,٠% of patients in the study group were aged between ٢٠ to less than ٣٠ years with a mean age $37,20 \pm 12,981$. As for gender, percentage of males are equal (٧٣,٣%) in both groups.

Concerning the marital status, the majority (٦٣,٣%) of the patients in both groups were single and (٣٠,٠%) in both groups were married. As for the educational level, the majority (٦٣,٣%) of patients in both groups had secondary education. In relation to work, (٦٣,٣% and ٧٠,٠%) of control and study groups respectively were not working. Regarding residence, the highest percentage of patients was from rural areas either in control and study group (٧٦,٧% and ٧٠,٠% respectively). Regarding income, the most (٩٣,٣%) of patients in both groups did not have enough income.

Table (٢) illustrates the clinical characteristics of the studied patients. It showed that ٤٣,٣% of patients in the control

group and 60.0 % of patients in the study group, aged at the onset of the disease between 18 years and less than 30 years, with a mean age of disease onset for control group 22.27 ± 10.37 and 22.13 ± 10.64 for the study group. Regarding the number of previous admissions for treatment, it was clear that (0.0%) of patients in the control group admitted 4-6 times, compared to (0.6, 7%) admitted 1-3 times in the study group. In relation to duration of disease, (0.0% and 60.0% respectively) of patients in the control and study group had duration of illness of less than five years. Also, as regard to the type of admission, all patients (100.0 %) either in both control and study groups were admitted involuntarily to the hospital.

Table (3) clarifies the mean score of the Scale for the Assessment of Negative Symptoms (SANS) among the studied groups. It can be noticed that the total mean score of the Scale for the Assessment of Negative Symptoms in the control group pre-program (91.17 ± 18.76) was higher than the experimental group (78.30 ± 18.96) and this total score in the study group decreased to (41.20 ± 16.06) immediately after the program, which raised slightly to (40.03 ± 21.66) at one month after the program, with a statistically significant difference $P=0.000$. This means that there

was a statistical improvement in negative symptoms immediately after implementation of the program and this improvement declined at follow up but still significant than pre-program.

Also, statistical significant differences were found among both study and control group regarding total score of the Scale for the Assessment of Negative Symptoms since $P=0.009$ at pre-program, $P=0.000$ immediately after the program and $P=0.000$ at one month after the program.

Comparing scores of the patients at the end point of the program by their scores at the starting point of the program: There were significant differences in the study group as regard their affective flattening or blunting ($P=0.000$), alogia ($P=0.004$), avolition/apathy ($P=0.000$), anhedonia/asociality ($P=0.000$), and attention ($P=0.000$). The same is true among the control group in regard to their alogia ($P=0.001$), avolition/apathy ($P=0.000$), except that of affective flattening, anhedonia/asociality and attention.

Figure (1) presents a Comparison of patients' total level of negative symptoms between control and study group throughout the phases of the study. The figure showed that before program, 60.0 %

of the patients in the control group had severe negative symptoms and ٥٣,٣ % of patients in the study group had moderate negative symptoms at pre-program. But immediately after the program, ٩٠,٠% of patients in the study group had mild levels of negative symptoms at immediately after the program, while it decreased to ٨٦,٧% at one month after the implemented program.

Figure (٢) illustrates a comparison of patients' total level of social skills domains between control and study group throughout phases of study. It was clear that in relation to non-verbal behavior and communication domain, the mean scores of the control and study group were (٢,٦٣) & (٣,٣٧) respectively pre-program. The mean score of the study group was increased to (٦,٢٣) immediately after the program and (٥,٩٧) at one month after the program.

In relation to verbal communication domain, the mean scores of the control and study group were (٣,٠٧) & (٦,٠٣) respectively at pre-program. The mean score of the study group was increased to (١٠,٥٣) immediately after the program and (٩,٥٣) at one month after the program.

In regard to social behavior domain, the mean scores of the control and study group

were (٤,٥٣) & (٧,٦٠) respectively at the before the program. Immediately after the program, the mean score of the study group was increased to (١٨,٦٣) and (١٥,٨٣) at one month after the program.

Additionally, the figure displayed that at pre-program, the total mean score of social skills among the control group was (١٠,٢٣), in comparison to (١٧,٠٠) in the study group. Immediately after the program, the total mean score of social skills as measured by the social skills screening scale in the study group was (٣٥,٤٠) and this score decreased slightly to (٣١,٣٣) at one month after the program.

Table (٤) describes the correlation between levels of social skills and levels of negative symptoms among the study and control group pre, immediately and at one month after the program.

Before the program, ٦٠,٠ % of the patients in the control group had severe levels of negative symptoms and severe deficits in social skills, compared to ٤٠,٠ % of the patients in the study group had moderate negative symptoms and severe deficits in social skills. In the same way, the table shows that there was a highly statistical significant negative correlation between levels of social skills and levels of negative

symptoms in the control group at $r=-0.86$, $P=0.000$ pre-program and there was a statistical significant negative correlation between levels of social skills and levels of negative symptoms in the study group at $r=-0.88$, $P=0.000$ pre-program.

While, **immediately after the program**, 36.7% of the patients in the control group had moderate levels of negative symptoms and severe deficits in social skills, compared to 90.0% of the patients in the study group had mild negative symptoms and mild deficits in social skills immediately post the program. Also, there was a highly statistical significant negative correlation between levels of social skills and levels of negative symptoms in control group at $r=-0.88$, $P=0.000$ and there was a statistical significant negative correlation between levels of social skills and levels of negative symptoms in the study group at $r=-0.88$, $P=0.000$.

Whereas, **at one month post the program**, 23.3% of the patients in the control group had moderate levels of negative symptoms and severe deficits in social skills, compared to 73.3% of the patients in the study group had mild negative symptoms and mild deficits in the social skills. Also, there was a highly statistical significant negative correlation between levels of social skills and levels of

negative symptoms in control group at $r=-0.81$, $P=0.000$ and there was a statistical significant negative correlation between levels of social skills and levels of negative symptoms in the study group at $r=-0.86$, $P=0.000$.

Table (5) represents the correlation of socio-demographic and clinical characteristics between study and control group in relation to the total negative symptoms score. The table revealed that according to the age of patients, patients aged twenty to less than thirty years, demonstrated high mean score of negative symptoms than the other age groups ($10.2, 13 \pm 13.87$) at pre-program in the control group, compared to ($87, 13 \pm 13.94$) in the study group, which decreased to ($44, 67 \pm 22.88$) immediately after the program and increased to ($51, 00 \pm 13.19$) at one month post the program. Also, there was a statistical significant negative correlation between total negative symptoms and age of patients only in the study group at one month post the program where $r=-0.377$, $P=0.040$. According to the educational level, illiterate patients showed high mean score of negative symptoms in the control group ($93, 20 \pm 14.38$), compared to ($93, 00 \pm 10.70$) in the study group at pre-

program, which significantly decreased to ($49,20 \pm 32,710$) immediately after the program and slightly raised to ($51,00 \pm 29,246$) at one month after the program.

Additionally, in regard to the age at the onset of the disease, it is clear that patients aged from 18 years to less than 30 years at the onset of the disease, exhibited high mean score of negative symptoms in the control group before the program ($102,78 \pm 11,476$), compared to ($83,40 \pm 22,007$) in the study group at pre-program, which significantly decreased to ($40,20 \pm 12,872$) immediately after the program and slightly raised to ($50,44 \pm 24,380$) at one month after the program. Also, a statistical significant negative correlation exists between total negative symptoms and age at the onset of the disease in the study group only at one month post the program where $r = -0,407$, $P = 0,026$.

In relation to duration of disease, those who had longer disease duration from ten years and more displayed high mean score of negative symptoms in the control group ($94,93 \pm 14,077$), compared to ($87,60 \pm 13,409$) in the study group at pre-program, which significantly decreased to ($44,40 \pm 12,807$) immediately after the

program and slightly raised to ($49,44 \pm 23,964$) at one month after the program.

Table (6) represents the correlation of socio-demographic and clinical characteristics between study and control group in relation to total social skills score. The table revealed that according to the age of patients, that patients aged fifty years and more, demonstrated high mean score of social skills than the other age groups ($16,83 \pm 12,481$) before the program in the control group, compared to ($20,80 \pm 10,304$) in the study group, which increased to ($37,40 \pm 1,342$) immediately after the program and slightly decreased to ($36,00 \pm 2,910$) at one month post the program. Also, there was a statistical significant positive correlation between total social skills and age of patients in the control group at before the program where $r = 0,398$, $P = 0,029$.

In the educational level, university patients are presented with high mean score of social skills in the control group ($14,00 \pm 16,263$), compared to ($21,00 \pm 8,180$) in the study group at pre-program, which significantly raised to ($37,33 \pm 2,082$) immediately after the program and ($36,33 \pm 2,309$) at one month after the program.

Regarding the patients' age at the onset of the disease, patients aged 50 years or more at disease onset evidenced high mean score of social skills in the control group (26.67 ± 2.01), compared to (22.67 ± 1.91) in the study group pre-program, which significantly raised to (37.20 ± 0.90) immediately after the program and slightly decreased to (30.67 ± 0.41) at one month after the program. Also, a statistical significant positive correlation exists between total social skills and age at the onset of the disease in the control group at before the program where $r=0.367$, $P=0.046$.

In relation to duration of disease, those who had a disease duration less than 5 years and more demonstrated high mean score of social skills in the control group (21.00 ± 12.36), compared to (23.00 ± 8.34) in the study group at preprogram implementation, which significantly increased to (37.40 ± 0.04) immediately after the program and slightly decreased to

(30.20 ± 2.49) at one month after the program. A statistical significant negative correlation exists between total social skills and duration of disease in the control group at before the program where $r=-0.489$, $P=0.006$ and in the study group at before the program where $r=-0.408$, $P=0.020$.

Table (١): Socio–demographic characteristics of the studied patients.

Characteristics	The studied patients (n=٦٠)				χ^2 P
	Control group (n=٣٠)		Study group (n=٣٠)		
	N	%	N	%	
Age (in years) ▪ ≥ ١٨ ▪ (٢٠- $<$ ٣٠) ▪ (٣٠- $<$ ٤٠) ▪ (٤٠- $<$ ٥٠) ▪ ≥ ٥٠	٣ ٨ ٦ ٥ ٨	١٠,٠ ٢٦,٧ ٢٠,٠ ١٦,٧ ٢٦,٧	٠ ١٢ ٨ ٥ ٥	٠,٠ ٤٠,٠ ٢٦,٧ ١٦,٧ ١٦,٧	٣,٨٩١ ٠,٤٢١
Range Mean \pm SD	(١٨-٦٦) ٣٧,٠٣ \pm ١٣,٧٩٣		(٢١-٧٥) ٣٧,٢٠ \pm ١٢,٩٨١		
Gender ▪ Male ▪ Female	٢٢ ٨	٧٣,٣ ٢٦,٧	٢٢ ٨	٧٣,٣ ٢٦,٧	٠,٦٣٢ ١,٠٠
Marital status ▪ Single ▪ Married ▪ Divorced ▪ Widow ▪ Separated	١٩ ٩ ٠ ١ ١	٦٣,٣ ٣٠,٠ ٠,٠ ٣,٣ ٣,٣	١٩ ٩ ٢ ٠ ٠	٦٣,٣ ٣٠,٠ ٦,٧ ٠,٠ ٠,٠	٤,٠٠ ٠,٤٠٦
Educational level ▪ Illiterate ▪ Read & write ▪ Secondary education ▪ University and more	٤ ٢ ١٩ ٥	١٣,٣ ٦,٧ ٦٣,٣ ١٦,٧	٤ ٤ ١٩ ٣	١٣,٣ ١٣,٣ ٦٣,٣ ١٠,٠	

Occupation					
▪ Working	١١	٣٦,٧	٩	٣٠,٠	٠,٣٣٦
▪ Not working	١٩	٦٣,٣	٢١	٧٠,٠	٠,٧٨٥
Place of residence					
▪ Rural	٢٣	٧٦,٧	٢١	٧٠,٠	٠,٦٣٢
▪ Urban	٧	٢٣,٣	٩	٣٠,٠	٠,٧٧١
Income					
▪ Enough	٢	٦,٧	٢	٦,٧	٠,٣٠٦
▪ Not enough	٢٨	٩٣,٣	٢٨	٩٣,٣	١,٠٠٠

Table (٢): Clinical characteristics of the studied patients.

Characteristics	The studied patients (n=٦٠)				χ^2 P
	Control group (n=٣٠)		Study group (n=٣٠)		
	N	%	N	%	
Age at the onset of the disease					
▪ (١٨ < ٣٠)	١٣	٤٣,٣	١٨	٦٠,٠	٢,٠٦٠ ٠,٥٦٠
▪ (٣٠ <= ٤٠)	٩	٣٠,٠	٥	١٦,٧	
▪ (٤٠ <= ٥٠)	٥	١٦,٧	٤	١٣,٣	
▪ ≥ ٥٠	٣	١٠,٠	٣	١٠,٠	
Range	(١٨-٥٨)		(١٨-٦٠)		t=٠,٤١٨
Mean ± SD	٣٣,٢٧±١٠,٣٧٥		٣٢,١٣±١٠,٦٤٤		P=٠,٦٧٨
Number of previous admissions					
▪ (١-٣)	١٢	٤٠,٠	١٧	٥٦,٧	٢,١٩٥ ٠,٣٣٤
▪ (٤-٦)	١٥	٥٠,٠	١٢	٤٠,٠	
▪ ≥ ٧	٣	١٠,٠	١	٣,٣	
Duration of disease (in years)					
▪ < ٥	١٥	٥٠,٠	١٨	٦٠,٠	٣,٣٤١ ٠,١٨٨
▪ (٥-٩)	١١	٣٦,٧	٥	١٦,٧	
▪ ≥ ١٠	٤	١٣,٣	٧	٢٣,٣	

Type of admission					
▪ Involuntary	٣٠	١٠٠,٠	٣٠	١٠٠,٠	-

Table (٣): Mean score of the Scale for the Assessment of Negative Symptoms (SANS) among the studied groups.

The Scale for the Assessment of Negative Symptoms	The studied patients (n=٦٠)							
	Range Mean ± SD							F P
	Control group (n=٣٠)			F P	Study group (n=٣٠)			
Pre	Immediatel y	Post ١ month	Pre		Immediatel y	Post ١ month		
١. Affective flattening or blunting	(١٧-٤٠) ٣١,٤٣±٦,٩١٧	(١٩-٤٠) ٢٨,٢٣±٦,٧٥٠	(١٥-٤٠) ٢٥,٨٣±٦,٦١٣	٥,١٧٨ ٠,٠٠٨	(١٦-٣٩) ٢٧,٤٠±٧,٠١٠	(١٠-٣٥) ١٧,٤٧±٦,٥٤٨	(٨-٣٩) ١٨,٥٣±٦,٩٠٧	١٩,١٤ ٠ ٠,٠٠٠ *
٢. Alogia	(٠-٢٥) ١٢,٤٣±٥,٩٦٩	(٠-٢٥) ٩,٨٣±٦,٦٨٥	(٠-٢٥) ٥,٩٣±٦,٦٩٥	٧,٦٩٧ ٠,٠٠١*	(٠-٢٥) ٧,٥٠±٦,٠٥٦	(٠-١٢) ٢,٩٣±٤,٠٤٢	(٠-٢٥) ٤,٣٠±٥,٦٣٩	٥,٨٢٩ ٠,٠٠٤ *
٣. Avolition /Apathy	(١٠-٢٠) ١٧,١٠±٣,٤٢٨	(٦-٢٠) ١٤,١٠±٤,٠٠٨	(٠-٢٠) ١٢,١٣±٤,٩٦٦	١٠,٦٢٤ ٠,٠٠٠*	(١٠-٢٠) ١٥,٨٠±٣,٥١٧	(٠-٢٠) ٥,٥٣±٣,٩٥٤	(٠-٢٠) ٦,٤٣±٤,١٩٩	٦٣,٧٤ ٠ ٠,٠٠٠ *
٤. Anhedonia/Asociality	(١٢-٢٥) ١٨,٩٣±٣,٨٩٥	(١١-٢٥) ١٨,٣٠±٤,٠٣٦	(١٠-٢٥) ١٥,٨٧±٣,٦٥٥	٥,٢٦٤ ٠,٠٠٧	(١١-٢٥) ١٧,٥٧±٣,٣٦٠	(٦-١٩) ١٠,٩٠±٢,٩٥٢	(١-٢١) ١١,٠٠±٤,٢٣٥	٣٤,٦٣ ٠ ٠,٠٠٠ *
٥. Attention	(١-١٥) ١١,٢٧±٤,٢٩٩	(٠-١٥) ٩,٥٧±٤,٥٩٩	(٠-١٥) ٨,٣٧±٤,٧٦٦	٣,٠٦٨ ٠,٠٥٢	(٤-١٥) ١٠,٠٣±٣,٢٥٣	(٠-١٢) ٤,٣٧±٣,٥٨٦	(٠-١٥) ٥,٢٧±٣,٦٠٠	٢٢,٩٢ ٠ ٠,٠٠٠ *
Total score of the Scale for the Assessment of Negative Symptoms	(٥١-١١٦) ٩١,١٧±١٨,٧٦	(٤٠-١٢٥) ٨٠,٠٣±٢٢,٥٧٥	(٣٣-١١٦) ٦٨,١٣±٢٢,٧١٤	٨,٦٦٩ ٠,٠٠٠*	(٤٦-١٢٠) ٧٨,٣٠±١٨,٠٩٦	(١٦-٩٧) ٤١,٢٠±١٦,٥٦٠	(١٦-١٢٠) ٤٥,٥٣±٢١,٠٦٦	٣٥,٤٢ ٢ ٠,٠٠٠ *
Group ١ Vs. Group ٢ t, P	٢,٧٠٤, ٠,٠٠٩*	٧,٥٩٧, ٠,٠٠٠*	٣,٩٩٦, ٠,٠٠٠*					

* Significant at level $P < ٠,٠٥$.

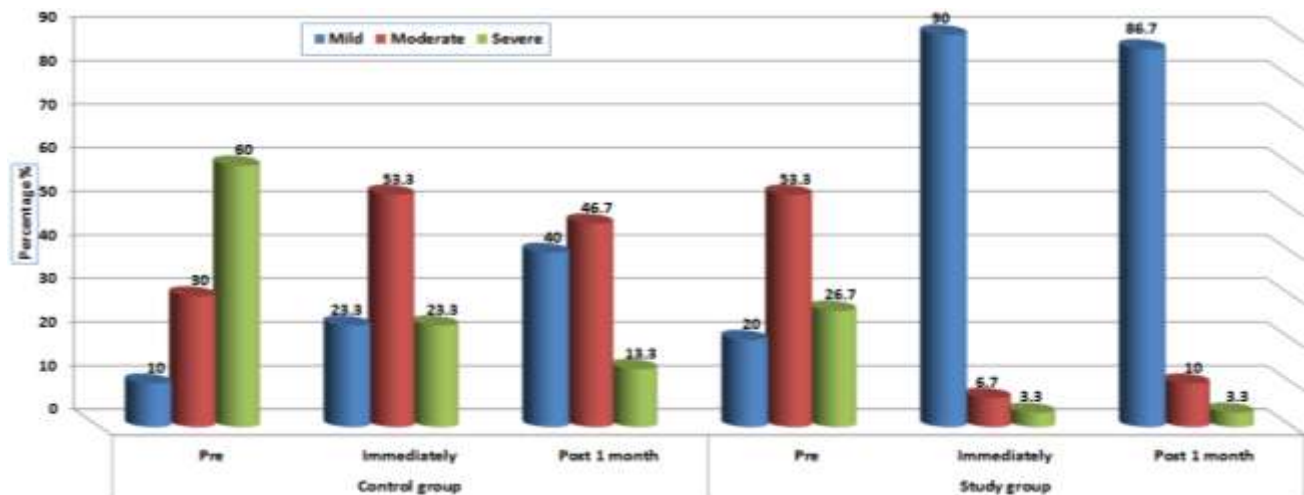


Figure (١): Comparison of patients' total level of negative symptoms between control and study group throughout the phases of the study

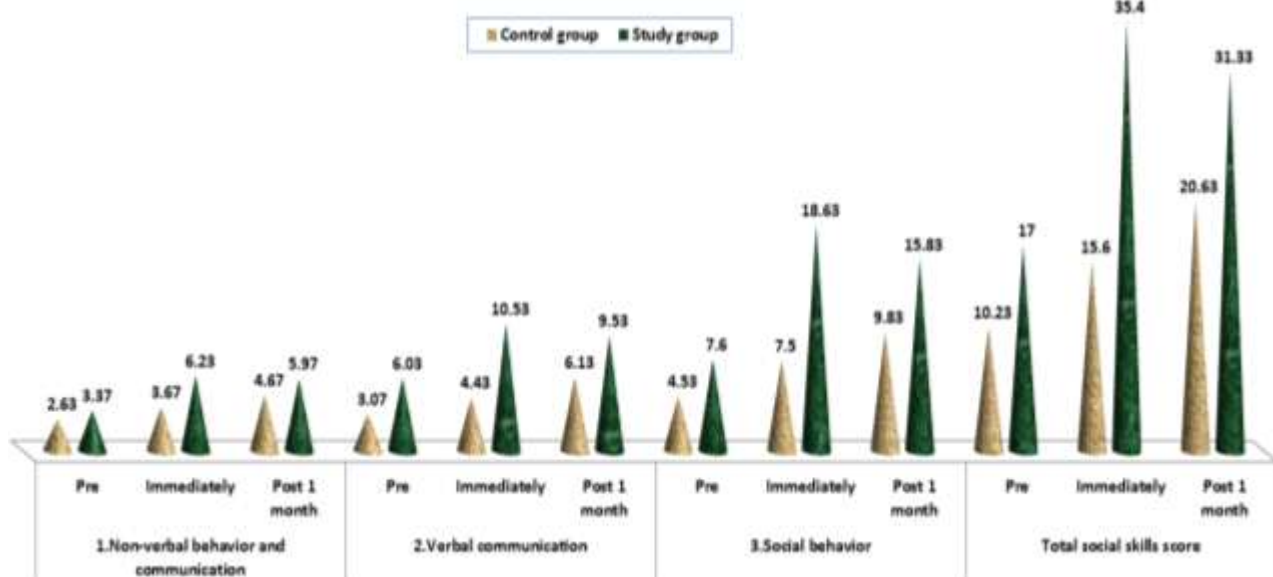


Figure (٢): Comparison of patients' total level of social skills domains between control and study group throughout phases of study.

Table (٤): Correlation between levels of social skills and levels of negative symptoms among the study and control group pre, immediately and at one month after the program.

Total Levels of negative symptoms	The studied patients (n=٦٠)													
	Total levels of social skills													
	Control group (n=٣٠)						χ ^٢ P	Study group (n=٣٠)						χ ^٢ P
	Severe		Moderate		Mild			Severe		Moderate		Mild		
N	%	N	%	N	%		N	%	N	%	N	%		
Pre														
١. Mild	٠	٠,٠	٣	١٠,٠	٠	٠,٠	١٧,٥٧	٠	٠,٠	٦	٢٠,٠	٠	٠,٠	١١,٢٥
٢. Moderate	٥	١٦,٧	٤	١٣,٣	٠	٠,٠	٨	١٢	٤٠,٠	٤	١٣,٣	٠	٠,٠	١
٣. Severe	١٨	٦٠,٠	٠	٠,٠	٠	٠,٠	٠,٠٠٠*	٦	٢٠,٠	٢	٦,٧	٠	٠,٠	٠,٠٠٤*
r , P	-٠,٨٦٠ , ٠,٠٠٠**							-٠,٦٨٢ , ٠,٠٠٠**						
Immediately														
٤. Mild	٠	٠,٠	٥	١٦,٧	٢	٦,٧	١٨,٢٤	٠	٠,٠	٠	٠,٠	٢٧	٩٠,٠	٤٤,٤٦
٥. Moderate	١١	٣٦,٧	٥	١٦,٧	٠	٠,٠	٤	٠	٠,٠	١	٣,٣	١	٣,٣	٤
٦. Severe	٧	٢٣,٣	٠	٠,٠	٠	٠,٠	٠,٠٠١*	١	٣,٣	٠	٠,٠	٠	٣,٣	٠,٠٠٠*
r , P	-٠,٨٨٠ , ٠,٠٠٠**							-٠,٧٨٦ , ٠,٠٠٠**						
Post ١ month														
٧. Mild	١	٣,٣	٥	١٦,٧	٦	٢٠,٠	١٤,٨١	٠	٠,٠	٤	١٣,٣	٢٢	٧٣,٠	٢٥,١٢
٨. Moderate	٧	٢٣,٣	٦	٢٠,٠	١	٣,٣	٦	١	٣,٣	٢	٦,٧	٠	٣	٨
٩. Severe	٤	١٣,٣	٠	٠,٠	٠	٠,٠	٠,٠٠٥*	١	٣,٣	٠	٠,٠	٠	٠,٠	٠,٠٠٠*
r , P	-٠,٨١٥ , ٠,٠٠٠**							-٠,٨٦٠ , ٠,٠٠٠**						

r: Pearson correlation coefficient * Significance at level $P < ٠,٠٥$.
 at level $P < ٠,٠١$.

**Highly significance

Table (5) Correlation of socio-demographic and clinical characteristics between study and control group in relation to the total negative symptoms score.

Characteristics	Total SANS score Mean \pm SD					
	Control group (n=30)			Study group (n=30)		
	Pre	Immediately	Post 1 month	Pre	Immediately	Post 1 month
Age (in years)						
▪ ≥ 18			70,33 \pm 37,89 9			-
▪ (20-<30)			73,20 \pm 19,39 7	-	-	01,00 \pm 13,19
▪ (30-<40)	90,00 \pm 21,932	78,33 \pm 28,729				1
▪ (40-<50)	102,13 \pm 13,871	87,70 \pm 34,430	09,20 \pm 21,93	87,13 \pm 13,943	44,77 \pm 22,884	00,00 \pm 28,00
▪ ≥ 50	87,00 \pm 18,202	70,00 \pm 14,948	3	77,00 \pm 19,172	44,13 \pm 11,032	43,00 \pm 10,47
	87,80 \pm 24,387	81,20 \pm 17,820	73,00 \pm 27,78	77,80 \pm 20,177	37,00 \pm 8,480	4
	82,33 \pm 17,703	79,83 \pm 29,790	0	70,00 \pm 19,003	32,40 \pm 8,444	28,40 \pm 8,032
			78,00 \pm 20,13			
			0			
r, P	-0,200, 0,183	-0,007, 0,972	0,000, 0,992	-0,199, 0,292	-0,263, 0,170	-0,377, 0,040*
Educational level						
▪ Illiterate			90,00 \pm 17,77			01,00 \pm 29,24
▪ Read & write			8			7
▪ Intermediate education	93,20 \pm 14,380	90,00 \pm 17,778	70,70 \pm 7,180	93,00 \pm 10,708	49,20 \pm 32,710	49,00 \pm 10,81
▪ University	91,00 \pm 17,971	78,70 \pm 9,210	77,90 \pm 22,09	70,00 \pm 14,027	48,00 \pm 14,702	1
	91,47 \pm 20,340	82,00 \pm 27,178	9	79,17 \pm 17,777	38,42 \pm 13,771	40,11 \pm 22,21
	88,40 \pm 21,149	77,40 \pm 17,197	71,70 \pm 31,91	70,33 \pm 29,400	39,00 \pm 14,027	8
			1			37,33 \pm 11,01
						0
r, P	-0,073, 0,739	0,098, 0,707	-0,171, 0,377	0,040, 0,814	-0,244, 0,193	-0,177, 0,379
Age at the onset of the disease						
▪ (18<30)			74,33 \pm 17,72			00,44 \pm 24,38
▪ (30-<40)			1			0
▪ (40-<50)	102,78 \pm 11,477	88,22 \pm 21,810	77,47 \pm 27,77	83,40 \pm 22,007	40,20 \pm 12,872	44,70 \pm 11,08
▪ ≥ 50	89,80 \pm 18,823	78,00 \pm 18,793	7	78,00 \pm 17,714	42,78 \pm 19,480	9
	87,20 \pm 20,837	83,00 \pm 32,381	77,00 \pm 23,22	78,70 \pm 11,899	34,00 \pm 7,371	34,70 \pm 14,99
	78,77 \pm 12,808	09,33 \pm 17,703	7	78,00 \pm 20,981	34,00 \pm 10,392	7
			70,33 \pm 10,00			32,00 \pm 7,928
			3			

r, P	-0.249, 0.184	-0.120, 0.011	-0.053, 0.779	-0.210, 0.203	-0.244, 0.190	-0.407, 0.026*
Duration of disease (in years)						
▪ < 0	92,82±20,341	77,82±20,971	70,00±20,22	79,94±17,107	43,33±19,472	42,40±10,708
▪ (0-9)	72,00±22,038	70,00±20,067	73,00±27,887	77,43±20,387	33,43±7,949	37,71±10,067
▪ ≥ 10	94,93±14,077	80,03±22,479	74,27±17,900	87,70±13,409	44,40±12,807	49,44±23,974
r, P	0.336, 0.070	0.299, 0.108	0.056, 0.769	0.237, 0.208	0.227, 0.227	0.241, 0.200

r: Pearson/Spearman' correlation coefficient

* Significance at level $P < 0.05$.

** Highly significance at level $P < 0.01$.

Table (٦) Correlation of socio-demographic and clinical characteristics between study and control group in relation to total social skills score.

Characteristics	Total social skills score Mean ± SD					
	Control group (n=30)			Study group (n=30)		
	Pre	Immediately	Post 1 month	Pre	Immediately	Post 1 month
Age (in years)						
▪ ≥ 18					-	-
▪ (20-30)	7,00±7,083	14,00±11,136	18,33±14,104	-	33,33±8,300	28,70±12,743
▪ (30-40)	9,70±7,810	18,70±8,362	24,13±10,371	10,42±7,994	0	43
▪ (40-50)	7,88±7,209	13,00±8,767	17,73±12,103	10,38±0,290	37,13±1,450	32,38±0,299
▪ ≥ 50	11,00±13,342	11,40±11,908	19,20±11,032	19,70±8,000	8	0
	17,83±12,481	18,00±13,896	23,77±11,130	20,80±10,300	37,20±1,300	31,20±9,333
				4	4	8
				37,40±1,344	37,00±2,911	0
r, P	0.398, 0.029*	0.074, 0.798	0.071, 0.711	0.277, 0.139	0.300, 0.108	0.202, 0.178

Educational level						
▪ Illiterate					٣٠,٥٠±١٣,٦	٢٥,٧٥±١٥,٧
▪ Read & write	١٠,٠٠±٨,٩٨١	١٧,٠٠±٩,٨٩٩	٢٢,٠٠±٩,٦٢٦	٢٠,٠٠±١٠,٨٩	٩٩	٥٦
▪ Intermediate education	١٢,٨٠±٩,٨٣٤	١٤,٥٠±١٦,٢٦٣	١٤,٥٠±١٦,٢٦٣	٣	٣٣,٧٥±٦,٥٥	٣١,٥٠±٦,٣٥
▪ University and more	٩,١٦±٩,٩٦٣	١٤,٤٧±١٠,٩٩٧	١٩,٧٩±١٠,٥٤٩	١٨,٢٥±٩,٧٠٨	١	١
	١٤,٥٠±١٦, ٢٦٣	١٩,٢٠±٧,٦٦٢	٢٥,٢٠±١٤,٦١٨	١٥,٤٧±٦,٨١٨	٣٦,٤٧±١,٤٦	٣١,٦٨±٨,٩٩
				٢١,٠٠±٨,١٨٥	٧	٤
					٣٧,٣٣±٢,٠٨	٣٦,٣٣±٢,٣٠
					٢	٩
r , P	٠,٠٢٥ , ٠,٨٩٦	٠,٠٣٥ , ٠,٨٥٦	٠,٠٨٦ , ٠,٦٥٣	-٠,٠٩٠ , ٠,٦٣٥	٠,٣٨٦ , ٠,٠٣٥	٠,٢٦٠ , ٠,١٦٥
Age at the onset of the disease						
▪ (١٨-< ٣٠)					٣٤,٢٢±٦,٨٣	٢٩,٣٣±١١,٠
▪ (٣٠-< ٤٠)	٩,٦٢±٧,٨٥٩	١٧,٦٩±٩,٤١١	٢١,٢٣±١١,٩٣٨	١٥,٨٩±٧,٢٠٢	٠	١٩
▪ (٤٠-< ٥٠)	٥,٧٨±٨,٢٨٨	١٠,٦٧±٩,٠٤٢	١٧,٠٠±١١,٤٦٧	١٥,٢٠±٧,٩٨١	٣٧,٢٠±١,٩٢	٣٤,٨٠±٣,٧٦
▪ ≥ ٥٠	١٠,٠٠±١٠,٨٨٦	١١,٢٠±١٠,٠٨٥	٢٠,٨٠±١٠,٧٣٣	٢٠,٠٠±٨,٠٨٣	٤	٨
	٢٦,٦٧±٢,٥١٧	٢٨,٦٧±٥,٥٠٨	٢٨,٦٧±٥,٥٠٨	٢٢,٦٧±١٠,٩٧	٣٧,٠٠±١,٧٣	٣٢,٧٥±٧,٨٤
				٠	٢	٨
					٣٧,٢٥±٠,٩٥	٣٥,٦٧±٤,٠٤
					٧	١
r , P	٠,٣٦٧ , ٠,٠٤٦*	٠,٠٩٦ , ٠,٦١٢	٠,١٢٦ , ٠,٥٠٨	٠,٢٨٧ , ٠,١٢٥	٠,٢٠٩ , ٠,٢٦٧	٠,٣٢٧ , ٠,٠٧٨
Duration of disease (in years)						
▪ < ٥	٢١,٥٠±١٢,٣٦٩	٢٣,٢٥±١٣,٨١٧	٢٥,٧٥±١٥,٥٢١	٢٣,٠٠±٨,٣٤٧	٣٧,٤٠±٠,٥٤	٣٥,٢٠±٢,٤٩
▪ (٥-٩)	٦,٦٠±٥,٣٦٩	١٣,٩٣±٩,٣٩٢	١٧,٤٥±١٠,١٦٢	١٥,٠٠±٦,٨٩٤	٨	٠
▪ ≥ ١٠	١١,٠٩±١٠,٩٣١	١٥,٠٩±٩,٩١٤	٢١,٦٠±١٠,٧٤٢	١٥,٨٠±٦,٨٣٤	٣٤,١٧±٦,٨٤	٢٩,٤٤±١٠,٩
					٥	٦١
					٣٧,١٤±١,٤٦	٣٣,٤٣±٧,٠٤
					٤	٤
r , P	-٠,٤٨٩ , ٠,٠٠٦**	-٠,٢٥٩ , ٠,١٦٦	-٠,٠٢٦ , ٠,٨٩٣	-٠,٤٠٨ , ٠,٠٢٥*	-٠,٢٥٣ , ٠,١٧٧	-٠,٢١١ , ٠,٢٦٣

r: Pearson/Spearman' correlation coefficient

* Significance at level $P < ٠,٠٥$.** Highly significance at level $P < ٠,٠١$.

are a major cause of social exclusion among the affected patients (Barranha et al, ٢٠٢٠)^(٣٢). It is the most severe and disabling psychiatric disorder (Behrouian et al, ٢٠٢٠)^(٣٣), affecting approximately ٠,٥–١% of the population globally (Vita et al, ٢٠١٩)

Discussion

Schizophrenia spectrum disorders are the most impairing psychological disorders and

^(٣٤). It encompasses symptoms divided into three dimensions: positive, negative, and cognitive. Negative symptoms are a common occurrence in patients with psychosis spectrum disorders (**Ristić I et al, ٢٠٢٠**)^(٣٥). Negative symptoms, in particular, have a major impact on the quality of life of the affected patients, and differing from positive symptoms, by being associated with a limited response to pharmacotherapy (**Cerveri et al, ٢٠١٩**)^(٣٦).

Negative symptoms of schizophrenia were associated with impairments in social and cognitive functioning leading to substantial long-term disability (**Gopal et al (٢٠٢٠)**)^(٣٧). More specifically, early presence of negative symptoms is associated with a worse course, and maximal impairments in adaptive life skills, (**Corcoran et al, ٢٠١١**)^(٣٨) and treatment of these negative symptoms of schizophrenia represents a major issue in determining the functional and social prognosis of the disease (**Maurel et al, ٢٠١٥**)^(٣٩)

Advances in the management of negative symptoms and social impairment in schizophrenia forced understanding that treatment by currently on the market antipsychotics alone will not restore the patient to proper social functioning and manage these relatively resistant and

challenging symptoms (**Lodovighi et al, ٢٠١٦**)^(٤٠). In this regard, the poor efficacy of drug treatments on the primary negative symptoms of schizophrenia has led to the emergence of new effective treatment strategies for more satisfactory treatment of these symptoms and the resultant social impairments (**Correll ٢٠٢٠**)^(٤١), **Favrod et al, ٢٠١٩**)^(٤٢), & **Almerie et al ٢٠١٥**)^(٤٣).

Thus, in order to mitigate these symptoms and their associated impairments, comprehensive treatment programs that involve combining both psychological and social interventions are recommended as a crucial element of care (**Blackman et al, ٢٠٢٠**)^(٤٤). Hence, one of these programs is the social skills enhancement training program. Therefore, in this study, the researcher applied social skills enhancement training program on patients with schizophrenia to verify its effects on patients' negative symptoms and social skills.

The results of the present study revealed that that there is a significant improvement in patients' negative symptoms and social skills immediately after implementation of the social skills enhancement training program. There were reductions in the negative symptoms and a significant increase in the mean scores of the social

skills immediately and at one month after the program in comparison with the scores before it. This result affirmed that, patients with schizophrenia were capable of learning a wide range of social skills. Supporting this, first, it is likely that this improvement might be due to the social skills enhancement training program used lectures, instructions, role play, attractive pictures, videos and group discussions as methods of training.

In the same line, the study of **Abd El Aziz et al** (٢٠١٧), revealed that there was a highly statistical significant reduction in the mean score of negative symptoms after the social skills training program and this program was effective in reducing the severity of symptoms^(٤٤). Also, the findings of **Abdel Hadyghaith et al** (٢٠١٩), lighted that after implementing social skills training program, there was a statistically significant difference between both groups regarding the total mean score of negative symptoms scale^(٤٥). Additionally, **Barzegar et al** (٢٠١٦), concluded that the mean score of negative symptoms in the experimental group after the program in the post-test was less than pretest^(١٨).

The resultant improvement in negative symptoms in the present study is in accordance with **Ventura et al** (٢٠١٩) study, which indicated that any non-

pharmacological interventions that could bring unexpected benefits for schizophrenia and can improve its negative symptoms, even at moderate levels, would go a long way toward improving the patient outcomes^(٤٦). Furthermore, the study of **Blackman & MacCabe** (٢٠٢٠) indicated that psychological and social interventions were a crucial element of care in schizophrenia, particularly in alleviating the negative and psychotic symptoms^(٤٧).

Furthermore, various research studies had confirmed our study results, where findings of **Ellis et al** (٢٠١٣) showed that negative symptoms of schizophrenia could be reduced through employing the appropriate plans and practices^(٤٧) and with the findings of **Turkington** (٢٠١٢) which their study displayed that social-psychological exercises could favorably affect negative symptoms though they were considered resistant against change after treatment^(٤٨). Also, **Bharathi et al** (٢٠١١), ascertained that social skills training supported in improving the negative symptoms when combined with medications^(٤٩).

In contrary with our findings, the studies of **Savill et al** (٢٠١٤)^(٥٠) and the study of **Fusar-Poli et al** (٢٠١٥)^(٥١) deduced that the implementation of both pharmacological and psychosocial interventions had only a

limited effect on reducing negative symptoms of schizophrenia. The results of **Granholt et al (٢٠١٨)** presented that the implementing psychosocial interventions in schizophrenia had significant but modest impact on negative symptoms ^(١٩). In addition to this, the studies of **Luther et al, ٢٠١٥ ^(٥٢)** & **Tandon et al, ٢٠١٠ ^(٥٣)** pointed that negative symptoms often persist despite their treatment by and antipsychotics and psychosocial interventions.

In relation to the total level of negative symptoms among the studied patients before the program the results revealed that about majority of the patients in the control group had severe negative symptoms and above half of patients in the study group had moderate negative symptoms at pre-program. This can be explained from the psychosocial perspective that negative symptoms can be viewed as emerging result of poor medications' adherence and as a manifestation of impoverished environment with lack of coherent stimulations and elimination of pleasurable and reinforcing stimuli. These findings are in agreement with **Mwansisya T et al (٢٠١٣)**, which showed that patients with chronic schizophrenia had more negative symptoms than others ^(٥٤).

Immediately after the program, the most of patients in the study group had mild levels of negative symptoms. This could be cited that the social skills enhancement training program in schizophrenia is of multidimensional approaches that targeted the five negative symptoms characteristic of schizophrenia. Last but not least, conducting sessions in the clients' environment reduces the demand for generalizability and has been found to be extremely effective in improving the adaptive behaviors, which in turn were reflected in improved negative symptoms.

The improvement and progress of negative symptoms among study group patients in this study occurred gradually during implementation of program sessions. From researcher's point of view, the improvement began after beginning of the first three sessions of the program when application of the self-care activities began. Some of the patients began to interact with the researcher and other patients, they asked questions, and they seemed more attentive during activity demonstration. Moreover, they asked the researcher to keep their self-care equipment to use them daily.

The role of group physical activity sessions was obvious as the patients appeared happier, motivated and interactive than before. This revealed that there was a

potential role of exercise in the reduction of negative symptoms of schizophrenia. This result was supported by (**Areshtanab, H et al., ٢٠١٦**) who found that exercise compared to standard care significantly improve negative symptoms of schizophrenia, especially affective flattening, anhedonia and social withdrawal^(٥٥).

In accordance with the significant improvement in the mean scores of the social skills immediately after the training program, that may be due to their levels of social skills were improved and increased after the training program. our study results are in the same line with the results of **Abd EL Aziz et al (٢٠١٧)**, which concluded that, there were a highly statistical significant relations between mean scores of pre and posttest in social skills^(٦). In light of this apparent improvement, **Kapse P et al (٢٠١٥)** declared that after the social skills training programme, there was a significant improvement in the patients' social skills^(٥٦). Furthermore, **Koujalgi et al (٢٠١٤)** mentioned that, social skills in the experimental group after the program were luxurious than before training^(١١).

The present study showed that there was a highly statistical significant negative correlation between total levels of social

skills and the total levels of negative symptoms.in the studied groups' pre, immediately and at one month after the program. This means that with reductions of patients' negative symptoms, their levels of social skills would increase. Thus, the observed correlation might be attributed to that the impact of schizophrenia is understandable considering the many dimensions the disease may influence. When patients are going through the negative symptoms, they get totally withdrawn within themselves and have no interest in their surroundings or even in their own body, creating emptiness in their life, remaining like a log in a corner.

This resultant correlation is in harmony with **Molnar M et al (٢٠٢٠)** study, which found that patients with predominant negative symptoms lose their motivation, cannot function at school or work, and their interpersonal relationships severely decay^(٥٧). Also, **Vangkilde A et al (٢٠١٦)** study showed strong correlation between levels of social impairments and subclinical negative symptoms^(٥٨). In addition to, **Velligan D et al (٢٠١٤)** pointed that negative symptoms, such as restricted affect, reduced emotional range, poverty of speech, diminished motivation and interests, decreased sense of purpose, and lessened social drive,

contribute virtually to social deficits for many people with schizophrenia ^(٥٩).

Furthermore, this is consistent with **Carrion R et al** (٢٠١٦) who suggested that longer duration of negative symptoms, show to be related to long term social impairments, even prior to the onset of psychosis. ^(٦٠). These findings were supported by **Tandon R et al** (٢٠١٠), where negative symptoms were major contributors to deterioration in most patients with schizophrenia, because poorly motivated patients cannot function at school or work, cannot initiate or maintain relationships with family and friends ^(٦١). In a similar study, a previous study done by **Lavelle M et al** (٢٠١٤), showed that patients with schizophrenia displayed fewer nonverbal behaviors inviting interaction, with negative symptoms exacerbating this pattern with negative symptoms as the primary predictor of impairments in social skills ^(٦٢).

In the same approach, the study of **Del Prette et al** (٢٠١٣) who presented that the social skills showed to correlate inversely with the positive and negative syndrome meaning that, in patients with schizophrenia, the higher the severity of their symptoms, the lower would be their skills abilities ^(٦٣). Similarly, **Samuel R et al** (٢٠١٨) who explained that negative symptoms along

with cognitive dysfunctions in schizophrenia were seen as may be the leading causes to deterioration in the basic life skills ^(٦٤). These findings were in agreement with **Brüne M et al** (٢٠١١) in their study that poor social skills seem to be related to the presence of negative symptoms ^(٦٥).

It was evident that the patients aged ٢٠ to less than ٣٠ years, demonstrated high mean score of negative symptoms than the other age groups and that there was a statistical significant negative correlation between total negative symptoms and age of patients only in the study group at one month post the program. This can be returned to that those patients had “Residual schizophrenia”, which is a chronic stage in the development of the illness in which there had been a clear progression from an early stage to a later stage characterized by long-term, though not necessarily irreversible, ‘negative’ symptoms,. In the same line, this result was consistent with the results of **Patel R et al** (٢٠١٥) who declared that negative symptoms are documented in the electronic health records of patients with schizophrenia, particularly in those who were relatively young ^(٦٦).

The study showed that there is a statistical significant negative correlation exists between total negative symptoms and age at

the onset of the disease in the study group only at one month post the program. This implicates that schizophrenia can be further subdivided in to two categories according to the age of onset. The early-onset which is before age ٤٠ years old and the late-onset which starts at ٤٠–٦٠ years old. Individuals with early-onset present with more premorbid impairment than do those with late-onset. This repeats the results of **Xu H et al (٢٠٢١)**, who concluded that earlier age of schizophrenia onset resulted in severe negative symptoms and younger age at onset is generally thought to be a predictor of poor outcome in early onset schizophrenia ^(٦٧). Another confirmatory study is the study of **Skokou M et al (٢٠١٢)**, which confirmed that late and older age of onset schizophrenia is associated with less severe negative symptoms and the prodromal phase of early onset schizophrenia is characterized by more negative symptoms compared to late onset schizophrenia ^(٦٨).

It is revealed that patients aged fifty years or more had a high mean score of social skills than other age groups, compared to the study group, which increased immediately after the program and slightly decreased at one month post the program and there was a statistical significant positive correlation between total social skills score and age of

patients in the control group at before the program. This finding can be explained by that age strengthen social skills. As people age, they experience less difficulty and less discomfort in social situations and in their ability to express themselves verbally because they learn more and more words throughout their lives.

Also, at a higher age, when personality has matured and attained a more stable structure of the self and the cognitive functions have fully developed. As a consequence, there will be less mental disorganization and social impairments. In the opposite way, **Muser K et al (٢٠١٠)** reported that older age was associated with worse social skills in schizophrenia .Older people with schizophrenia had worse fluency, interest, and overall social skills on the role-play test. Poor social skills in old age, were a fundamental feature of schizophrenia that persists from the onset of the illness into older age ^(٦٩).

It was observed that later age of disease onset at fifty or more was associated with high mean score of social skills compared to the study group pre-program, which significantly raised immediately after the program and slightly decreased at one month after the program. And a statistical significant positive correlation exists

between total social skills score and age at the onset of the disease in the control group at before the program. This can be explained by that, the psychotic disorder typically starts between adolescence and the beginning of adult life, but if the onset begins in later life as in fifty years or more, the social skills of the patient did not worsen since they are correctly structured at an early age before disease onset. This is consistent with the findings of **Díaz-Caneja et al, ٢٠٢٠**, who declared that early-onset psychosis (before age ١٨ years), is a severely debilitating condition associated with long-term psycho-social impairment^(٧٠).

The results demonstrated that those with a duration of illness lesser than five years have a high mean score of social skills than those with longer period and in the study group at pre-program implementation, which significantly increased immediately after the program and slightly decreased at one month after the program and a statistical significant negative correlation exists between total social skills score and duration of disease in the control group at before the program. This may be attributed to that schizophrenia is a chronic severe mental disorder, not only because of its symptom characteristics, but also because of the fragility of patients to

circumstances in their environment. So, increased duration of illness impair patients' ability to participate in social activities like parties and different therapeutic groups. In the same line, **Swain S et al (٢٠١٧)** mentioned that patients with longer duration of schizophrenia had increased level of psychosocial dysfunctions as a frank effect of the disease duration^(٧١).

Limitation of the study:-

- This study was carried out at only one hospital in El-Gharbia Governorate, so the findings are not representative all of it and may not be generalized to the all population of patients with schizophrenia in Egypt, hence the results might be limited to this setting.

Conclusions:-

Based on the results of the present study, it can be concluded that, the social skills enhancement training program was effective for patients with schizophrenia and brought a significant decrease in the severity of negative symptoms, and an improvement in their social skills in comparison to before the program. The total mean score of negative symptoms in the control group pre-program was higher than the experimental group and this total score in the study group decreased immediately after the program.

The total mean score of social skills among the control group was decreased than the study group before program. But immediately after the program, the total mean score of social skills in the study group was increased and decreased slightly at one month after the program.

Additionally, there was a highly statistical significant negative correlation between levels of social skills and levels of negative symptoms. Accordingly, when patients' level of negative symptoms decreased, their level of social skills would increase.

Recommendations

In the light of the study findings, the following recommendations were suggested:-

Recommendations for the organization:-

Social skills enhancement training program should be integrated in the psychiatric hospitals' protocol of care in conjunction with pharmacological therapy for going beyond the traditional treatment process of patients with schizophrenia.

Recommendations for the mental health nurses:-

- Develop social rehabilitation program to patients with schizophrenia.
- Necessity for continuous follow-up for patients with schizophrenia participating in

social skills enhancement training program to boost their learning skills.

- Priority should be given to training psychiatrists by focusing more on careful and up-to-date assessment of negative symptoms, including the assessment of internal experience and promotion of self-report of negative symptoms.

-Integrating social skills enhancement training in psychiatric nursing curriculum at both undergraduate and graduate levels to train psychiatric nurses in to the aspects of social skills training, may be a fruitful future direction.

Recommendations for future research:-

- Further research is needed to better understand the complex role of social skills and negative symptoms in deducing the prognosis of schizophrenia.
- Further research is needed to assess the generalizability of social skill training in real life situations and also factors affecting the generalization process from therapeutic settings to real life situations.

References

١. Abo elella E, Hashim N, Elhabiby M, Khalil S, Shorab I, Mounir M. Negative symptoms and functioning in institutionalized versus outpatient schizophrenic patients. Middle East Current Psychiatry. ٢٠١٥; ٢٢:٦٥-٩.

٢. Abd-elhay E, El-bilsha M, El-atroni M. The Effect of Auditory Hallucinations Management Program on Quality of Life for Schizophrenic Inpatients, Egypt. IOSR Journal of Nursing and Health Science. ٢٠١٧; ٦(١): ١-١١.
٣. Abd EL aziz E, Rady H, EL-din M. Effectiveness of Social Skills Training Program on Social Functioning and Severity of Symptoms Among Patients with Schizophrenia. American Journal of Nursing Science. ٢٠١٧; ٦(٦): ٤٥٤-٦٦.
٤. Kaneko K. Negative Symptoms and Cognitive Impairments in Schizophrenia: Two Key Symptoms Negatively Influencing Social Functioning. Yonago Acta Medica. ٢٠١٨; ٦١(٢): ٩١-١٠٢.
٥. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. ٥th ed. Washington D.C: American Psychiatric Association. ٢٠١٣; ٨٧-٨.
٦. Hunter R, Barry S. Negative symptoms and psychosocial functioning in schizophrenia: neglected but important targets for treatment. European Psychiatry. ٢٠١٢; ٢٧: ٤٣٢-٦.
٧. Elis O, Caponigro J, Kring A. Psychosocial treatments for negative symptoms in schizophrenia: Current practices and future directions. Clinical Psychology Review. ٢٠١٣; ٣٣(٨): ٩١٤-٢٨.
٨. Sarkar S, Hillner K, Velligan D. Conceptualization and treatment of negative symptoms in schizophrenia. World Journal of Psychiatry. ٢٠١٥; ٥(٤): ٣٥٢-٦١.
٩. Orellana G, Slachevsky A. Executive Functioning in schizophrenia. Frontiers Psychiatry. ٢٠١٣; ٤: ٣٥.
١٠. Hooley J. Social Factors in Schizophrenia. Psychological Science. ٢٠١٠; ١٩(٤): ٢٣٨-٤٢.
١١. Koujalgi S, Patil S, Nayak R, Chate S, Patil N. Efficacy of social skill training in patient with chronic schizophrenia: An interventional study. Journal of the scientific society. ٢٠١٤; ٤١(٣): ١٥٦-١٦١.
١٢. Kingwell K. Schizophrenia drug gets negative results for negative symptoms. Nature Reviews Drug Discovery. ٢٠١٤; ١٣: ٢٤٤-٤٥.
١٣. Reynolds G. The Pharmacogenetics of Symptom Response to Antipsychotic Drugs. Psychiatry Investigation. ٢٠١٢; ٩(١): ١-٧.
١٤. Blanchard J, Park S, Catalano L, Bennett M. Social Affiliation and Negative Symptoms in Schizophrenia: Examining

- the Role of Behavioral Skills and Subjective Responding. Schizophrenia Res. ٢٠١٥; ١٦٨(٠): ٤٩١-٩٧.
١٥. Kumar B, Singh A. Efficacy of Social Skills Training for the Persons with Chronic Schizophrenia. The Qualitative Report. ٢٠١٥; ٢٠(٥): ٦٦٠-٩٦.
 ١٦. Inchausti F, García-poveda N, Prado-abril J, Ortuño-sierra J, Gaínza-tejedor Y. Metacognition-oriented social skills training (MOSST): theoretical framework, working methodology and treatment description for patients with schizophrenia. Psychologist Papers. ٢٠١٧; ٣٨(٣): ٢٠٤-١٥.
 ١٧. Velentza O. Social Skills Training in Chronically Mentally Ill Patients under Psychosocial Rehabilitation. University of Athens. ٢٠١٦; ٢(١): ٧١-٩.
 ١٨. Barzegar S, Ahadi M, Barzegar Z, Ghahari S. The Effectiveness of Social Skills Training on Reducing Negative Symptoms of Chronic Schizophrenia. International Journal of Medical Research & Health Sciences. ٢٠١٦, ٥; ٧S: ٣٢٣-٢٧.
 ١٩. Granholm E, Harvey P. Social Skills Training for Negative Symptoms of Schizophrenia. Schizophrenia Bulletin. ٢٠١٨; ٤٤(٣): ٤٧٢-٧٤.
 ٢٠. Almerie M, Okba M, Jawoosh M, Alsabbagh M, Matar H, Maayan N. Social skills programmes for schizophrenia (Review). Cochrane Database of Systematic Reviews. John Wiley & Sons, Ltd. ٢٠١٥; ١: ٩٤.
 ٢١. Khalil A.A. Community Based Treatment: Impact of Social Skills Training Program on Improving Social Skills among Schizophrenic Patients. World Applied Sciences Journal. ٢٠١٢; ١٨ (٣): ٣٧٠-٧٨.
 ٢٢. Andreasen N. The Scale for the Assessment of Negative Symptoms. (SANS). Iowa City, University of Iowa, ١٩٨٤.
 ٢٣. Bhola P, Basavarajappa C, Guruprasad D, Hegde G, Khanam F, Thirthalli J, Chaturvedi S. Development of a social skills assessment screening scale for psychiatric rehabilitation settings: A pilot study. ٢٠١٦; ٣٨(٥): ٣٩٥-٤٠٣.
 ٢٤. Bellack A, Mueser K, Gingerich S, & Agresta J. Social skills training for schizophrenia: A step-by-step guide. United States of America: The Guilford Press. ٢٠٠٤, ٤٦-٦٣.
 ٢٥. Mueser K, Bond G, & Drake R. Community based treatment of schizophrenia and other severe mental disorders: Treatment outcomes.

- Medscape Psychiatry & Mental Health e Journal. ٢٠٠٢;٣(١): ١-١١.
٢٦. Kopelowicz A, Liberman R , Zarate R. Recent advances in social skills training for schizophrenia. Schizophrenia Bulletin. ٢٠٠٦;٣٢ Suppl ١:S١٢-٢٣.
٢٧. Almerie M, Okba M, Jawoosh M, Alsabbagh M, Matar H, & Maayan N. Social skills programmes for schizophrenia (Review). Cochrane Database of Systematic Reviews. John Wiley & Sons, Ltd. ٢٠١٥;١:٩٤.
٢٨. Barzegar S, Ahadi M, Barzegar Z, Ghahari S. The Effectiveness of Social Skills Training on Reducing Negative Symptoms of Chronic Schizophrenia. International Journal of Medical Research & Health Sciences. ٢٠١٦, ٥; ٧S:٣٢٣-٢٧.
٢٩. Kumar B, Singh A. Efficacy of Social Skills Training for the Persons with Chronic Schizophrenia. The Qualitative Report. ٢٠١٥; ٢٠(٥): ٦٦٠-٩٦.
٣٠. Velentza O. Social Skills Training in Chronically Mentally Ill Patients under Psychosocial Rehabilitation. University of Athens. ٢٠١٦; ٢(١):٧١-٩.
٣١. Inchausti F, García-Poveda N, Prado-Abril J, Ortuño-Sierra J , & Gaínza-Tejedor Y. Metacognition-oriented social skills training (mosst): theoretical framework, working methodology and treatment description for patients with schizophrenia. Psychologist Papers. ٢٠١٧; ٣٨(٣): ٢٠٤-١٥.
٣٢. Rui Barranha, Tânia Teixeira ١, João Quarenta, Orlando von Doellinger. Living conditions of patients with schizophrenia spectrum disorders in the region of 'Tâmega e Sousa' (Portugal). Int J Soc Psychiatry. ٢٠٢٠.
٣٣. Behrouian M, Ramezani T, Dehghan M, Sabahi A, Ebrahimnejad Zarandi B. The Effect of Emotion Regulation Training on Stress, Anxiety, and Depression in Family Caregivers of Patients with Schizophrenia: A Randomized Controlled Trial. Community Ment Health J. ٢٠٢٠; ٥٦(٦): ١٠٩٥-١١٠٢.
٣٤. Antonio Vita, Alessandra M, Stefano B, Giacomo D, Edoardo G, Paolo V, Cesare T, Massimo G. Treatment-Resistant Schizophrenia: Genetic and Neuroimaging Correlates. Front Pharmacol. ٢٠١٩; ١٠: ٤٠٢.
٣٥. Ivan Ristić, Stefan Jerotić, Mirjana Zebić, Bojana Savić, Vuk Vuković, Manuela Russo, Tatjana Voskresenski, Nikolina , Nada P. Marić. Factorial Structure of the Serbian Version of the Clinical Assessment

- Interview for Negative Symptoms – Evidence for Three Factors of Negative Symptoms. *Front Psychol.* 2020; 11: 07.306.
36. Cerveri G, Gesi C, Mencacci C. Pharmacological treatment of negative symptoms in schizophrenia: update and proposal of a clinical algorithm. *Neuropsychiatr Dis Treat.* 2019;10:1020-1030.
37. Srihari G, Jagadish G, Katalin P, Edward K, Arun S, Maju M. Improvement of Negative Symptoms in Schizophrenia with Paliperidone Palmitate 1-Month and 3-Month Long-Acting Injectables: Results from a Phase 3 Non-Inferiority Study. *Neuropsychiatr Dis Treat.* 2020; 16: 681-690.
38. Corcoran CM, First MB, Cornblatt B. The psychosis risk syndrome and its proposed inclusion in the DSM-V: a risk-benefit analysis. *Schizophr Res.* 2010 Jul;120(1-3):16-22.
39. Maurel M, Belzeaux R, Adida M, Azorin JM. Symptômes négatifs: quels antipsychotiques? [Negative symptoms: which antipsychotics?]. *Encephale.* 2010 Dec;36(6 Suppl 1):S32-0.
40. Lodovighi M, Palomba A, Belzeaux R, Adida M, Azorin JM, et al. Negative symptoms in schizophrenia: new pharmacological approaches. *L'Encéphale.* 2016; 41: 6S41-49
41. Christoph U Correll, Nina R Schooler . Negative Symptoms in Schizophrenia: A Review and Clinical Guide for Recognition, Assessment, and Treatment. *Neuropsychiatric Disease and Treatment.* 2020 ;16: 019-034.
42. Jérôme F , Alexandra , Anne-Marie Tronche , Olivier B , Julien D , Chereau-B , Delphine C , Pierre M . Impact of Positive Emotion Regulation Training on Negative Symptoms and Social Functioning in Schizophrenia: A Field Test. *Front Psychiatry.* 2019; 26(10):032.
43. Blackman G, MacCabe J. Schizophrenia Medicine .2020; 48(11):704-708.
44. Abd EL Aziz E, Rady H, & EL Din M. Effectiveness of Social Skills Training Program on Social Functioning and Severity of Symptoms among Patients with Schizophrenia. *American Journal of Nursing Science.* 2017;6(6):404-66.
45. Abdel Hady Ghaith R & Mohammed S. Efficacy of Social Skills Training On Symptoms Intensity, Insight and Social Functioning In Patients with Schizophrenia. *IOSR Journal of Nursing and Health Science.* 2019; 8(6): 12-20.

٤٦. Joseph V, Kenneth L, Subotnik L, Casaus, M, Gerhard H, Hellemann, K. Cognitive Remediation Can Improve Negative Symptoms and Social Functioning in First-Episode Schizophrenia: A Randomized Controlled Trial. *Schizophr Res.* ٢٠١٩; ٢٠٣: ٢٤-٣١.
٤٧. Elis O, Caponigro J, Kring A. Psychosocial treatments for negative symptoms in schizophrenia: Current practices and future directions. *Clinical Psychology Review.* ٢٠١٣; ٣٣(٨): ٩١٤-٢٨.
٤٨. Turkington D. Cognitive Therapy for Negative Symptoms of Schizophrenia. *Arch Gen Psychiatry.* ٢٠١٢; ٦٩(٢): ١١٩-١٢٠.
٤٩. Bharathi G, Huang N, Lu Z. Psychosocial interventions for patients with schizophrenia. *Shanghai Arch. Psychiatry.* ٢٠١١; ٢٣(٦): ٣٦٨-٣٧٥.
٥٠. Savill M, Banks C, Khanom H, S Priebe S. Do negative symptoms of schizophrenia change over time? A meta-analysis of longitudinal data. *Psychol Med.* ٢٠١٥ Jun; ٤٥(٨): ١٦١٣-٢٧.
٥١. Fusar P, Rocchetti M, Sardella A. Disorder, not just a state of risk: meta-analysis of functioning and quality of life in subjects at high clinical risk for psychosis. *Br Psychiatry* ٢٠١٥; ٢٠٧: ١٩٨-٢٠٦.
٥٢. Luther L, Coffin GM, Firmin RL, Bonfils KA, Minor KS, Salyers MP. A test of the cognitive model of negative symptoms: Associations between defeatist performance beliefs, self-efficacy beliefs, and negative symptoms in a non-clinical sample. *Psychiatry Res.* ٢٠١٥; ٢٦٩: ٢٧٨-٢٨٥.
٥٣. Rajiv T, Michael J. Negative symptoms of schizophrenia: How to treat them most effectively. *Current Psychiatry.* ٢٠٠٢ September; ١(٩): ٣٦-٤٢.
٥٤. Mwansisya T, Wang Z, Yang B, Li, L. Wang, P. Comparison of Psychosocial Determinants in Inpatients with First-Episode and Chronic Schizophrenia in China. *Archives of Psychiatric Nursing.* ٢٠١٣; ٢٧(١): ٣٢-٤١.
٥٥. Areshtanab H., Ebrahimi, H., Farnam, A., Mohammadpoorasl, A., Jamali, B., Piri, S. The effect of regular aerobic exercise on both positive and negative symptoms of male patients with chronic schizophrenia: A double blinded study. *International journal of medical research & health sciences.* ٢٠١٦; ٥ (١١), ٥٢٩-٥٣٥.
٥٦. Kapse P, & Nirmala B. Efficacy of Social Skills Training among Persons with

- Schizophrenia. International Journal of Psychosocial Rehabilitation. ٢٠١٥; ٢٠ (١): ٤٥-٥٠.
٥٧. Molnar M, Jimoh I, Zeke H, Palásti Á, & Fedo M. Early-Onset Schizophrenia With Predominantly Negative Symptoms: A Case Study of a Drug-Naive Female Patient Treated With Cariprazine. *Front Pharmacol.* ٢٠٢٠; ١١: ٤٧٧.
٥٨. Vangkilde A, Jepsen J, Schmock H, Olsen C, Arnarsdóttir S, Baaré, Plessen K, Didriksen M, Siebner H, Werge T, & Olsen L. Associations between social cognition, skills, and function and subclinical negative and positive symptoms in ٢٢q١١,٢ deletion syndrome. *J Neurodev Disord.* ٢٠١٦; ١٦: ٨: ٤٢.
٥٩. Velligan D, Alphas L. Negative Symptoms in Schizophrenia: An Update on Identification and Treatment. *Psychiatric Times.* ٢٠١٤; ٣١ (١١).
٦٠. Carrión R, Demmin D, Auther A, McLaughlin D, Olsen R, Lencz T, Correll C, & Cornblatt B. Duration of attenuated positive and negative symptoms in individuals at clinical high risk: Associations with risk of conversion to psychosis and functional outcome. *J Psychiatr Res.* ٢٠١٦; ٨١: ٩٥-١٠١.
٦١. Tandon R., Nasrallah H.A., Keshavan M.S. Schizophrenia, “just the facts” ٥. Treatment and prevention. past, present, and future. *Schizophr. Res.* ٢٠١٠; ١٢٢(١-٣): ١-٢٣.
٦٢. Lavelle M, Healey P, & McCabe R. Nonverbal Behavior During Face-to-face Social Interaction in Schizophrenia A Review. *The Journal of nervous and mental disease.* ٢٠١٤; ٢٠٢(١): ٤٧-٥٤.
٦٣. Del Prette ZAP, Del Prette A. Social Skills Inventory: Characteristics and Studies in Brazil. In: Osorio FL, editor. *Social Anxiety Disorder: From Research to Practice.* Psychology Research Progress. Ribeirão Preto, São Paulo, Brazil: Nova Science Publishers, Inc.; ٢٠١٣. p. ٤٧-٦٠.
٦٤. Samuel R, Thomas E, & Jacob K. Instrumental Activities of Daily Living Dysfunction among People with Schizophrenia. *Indian J Psychol Med.* Mar-Apr ٢٠١٨; ٤٠(٢): ١٣٤-١٣٨.
٦٥. Brüne M, Schaub D, Juckel G, & Langdon R. Social skills and behavioral problems in schizophrenia: the role of mental state attribution, neuro-cognition and clinical

- symptomatology. Psychiatry Res. ٢٠١١;١٩٠(١):٩-١٧.
٦٦. Patel R, Jayatilleke N, Broadbent M, Chang CK, Foskett N, Gorrell G, Hayes RD, Jackson R, Johnston C, Shetty H, Roberts A, McGuire P, Stewart R. Negative symptoms in schizophrenia: a study in a large clinical sample of patients using a novel automated method. BMJ Open. ٢٠١٥ ٧;٥(٩):e٠٠٧٦١٩.
٦٧. Hang X, Jiesi W, Yongjie Z, Dachun C, Meihong X, Li W, Xiangyang Z. BDNF affects the mediating effect of negative symptoms on the relationship between age of onset and cognition in patients with chronic schizophrenia. Psychoneuro endocrinology. ٢٠٢١;١٢٥:١٠٥١٢١.
٦٨. Maria S, Aggeliki K, Ioannis A, Philippos G. Active and prodromal phase symptomatology of young-onset and late-onset paranoid schizophrenia]. Rev Psiquiatr Salud Ment. ٢٠١٢;٥(٣):١٥٠-٩.
٦٩. Mueser K, Pratt S, Bartels S, Forester B, Wolfe R, Cather C. Neurocognition and social skill in older persons with schizophrenia and major mood disorders: An analysis of gender and diagnosis effects. J. Neurolinguistics. ٢٠١٠;٢٣(٣):٢٩٧-٣١٧.
٧٠. Díaz-Caneja CM, Pina-Camacho L, Rodríguez-Quiroga A, Fraguas D, Parellada M, Arango C. Predictors of outcome in early-onset psychosis: a systematic review. NPJ Schizophr. ٢٠١٥; ١:١٤٠٠٥.
٧١. Sarada S, Sushree S, Behura M, Kumar D, Anil K, Saswati S. The Influence of Psychosocial Dysfunctions in Chronic Schizophrenia Patients in Remission: A Hospital-Based Study. Indian J Psychol Med. ٢٠١٧; ٣٩(٢): ١٥٧-١٦٣.

Effect of Transition Care Educational Program on Transitional Readiness, Self-Efficacy and Quality of Life among Adolescents with Type ١ Diabetes Mellitus

Amal Gharib Sabaq^١, Samah El Awady Bassam^٢, Khadiga M. Said^٣

^١Assistant Professor of Pediatric Nursing, Faculty of Nursing, Benha University, Egypt.

^٢Assistant Professor of Pediatric Nursing, Faculty of Nursing, Zagazig University, Egypt.

^٣Assistant Professor of Pediatric Nursing, Faculty of Nursing, Benha University, Egypt.

Corresponding Author; dr_amalgharib@yahoo.com

Abstract

Background: Adolescents with type ١ diabetes must make the transition to adult-oriented health care as part of their development. Transition care is a multi-year process begins early in adolescence to provide healthcare that is developmentally-appropriate for enhancing effective knowledge and self-management. **The aim of this study** was to evaluate the effect of transition care educational program on transitional readiness, self-efficacy and quality of life among adolescent with type ١ diabetes mellitus. **Design:** A quasi-experimental research design was utilized to accomplish the aim of this study. **Setting:** This study was conducted in the outpatient diabetes clinic at health insurance hospital affiliated to Egyptian Ministry of Health and population at Benha city. **Subjects:** A purposive sample of (٦٠) adolescents with type ١ diabetes mellitus were included in this study. **Four tools were used for data collection:** A structured interviewing questionnaire, transition readiness assessment tool, self-efficacy questionnaire and Pediatric quality of life inventory diabetes module. **Results:** There was a highly statistical significant difference in all mean scores of adolescents' transition readiness, self-efficacy and quality of life domains three months post-program and six months follow-up assessment compared with the pre-program phase. **Conclusion:** The transition care educational program was a good strategy in improving transition readiness, self-efficacy and quality of life among adolescents with type ١ diabetes mellitus. **Recommendation:** Continuous implementation of transitional care program for adolescents with type ١ diabetes mellitus with the importance of follow-up in order to assess its long-term effects.

Keywords: Transition care educational program, Transitional readiness, Self-efficacy, Quality of life, Adolescents, Type ١ diabetes mellitus.

Introduction

Type ١ diabetes mellitus (T١DM) is a chronic, incurable condition that is one of the most common non-communicable diseases globally. The International Diabetic Federation define the term diabetes mellitus as a group of metabolic diseases with a variety of etiologies that are characterized by chronic hyperglycemia with disturbances of carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, insulin action, or both^(١). Type ١ diabetes mellitus represents the ending result of an autoimmune destruction of the pancreatic islet beta cells resulting in complete insulin deficiency. The cause of T١DM is unknown. However, multiple genetic and environmental risk factors appear to play a significant role in the genesis of the disease^(٢).

Diabetes mellitus is a serious disease found in children and adolescents, known as juvenile onset diabetes which associated with significant mortality and morbidity issues. Worldwide, around half a million children under the age of ١٥ years old have type ١ diabetes mellitus and more than ٧٩,٠٠٠ adolescents are diagnosed with T١DM everyday^(٣). The world's greatest incidence is in Finland, where approximately ٦٠٠ children and adolescents become ill

each year, and the world's lowest incidence is in China. The frequency is expected to reach ٢٨٥ million in the year ٢٠٢٥, the growing incidence of diabetes can be attributed to an increase in obesity, lack of exercise, diet high in processed sugars, and overall lack of diabetes self-care. In Egypt, the prevalence rate of type one DM in children and adolescents is ٠,٧/١٠٠٠ and the incidence rate is ٤,٠١/١٠٠٠٠٠^(٤,٥).

Transition is a concept that means a period between two stable states in a person's development. It is an active process that includes preparing adolescents with a chronic illness for adult care both before and after the transition. This period brings instability and vulnerability. Transition readiness has been developed for identifying and tracking critical components of health independence for clinical and research purposes. Transition is challenging for adolescents and their parents, many adolescents are unable to properly transfer to adult healthcare due to a lack of adequate support structures and education^(٦,٧).

Adolescents with type ١ diabetes must make the transition to adult-oriented health care as part of their development. Transition care is a multi-year process that should start early in adolescence. Its goal is to provide healthcare that is coordinated and

developmentally-appropriate for enhancing effective knowledge, self-management and advocacy in order to ensure adequate readiness for meeting the demands of adult-oriented health care and to facilitate access to continuous health care into adulthood ^(8,9).

Complication of ineffective transition care involving deterioration in glycemic control, decreased adherence to self-care management and increased involvement in risk-taking behaviors. These combined factors raise the risk of inadequate medical follow-up care, which leads to an increase in the incidence of acute and chronic diabetic complications, as well as hospitalizations. As a result, it is critical to construct a smooth transition process for adolescents with type 1 diabetes in order to avoid complications. ^(10,11).

Self-efficacy is task and context specific judgment of an individual's ability to organize and execute courses of action ⁽¹²⁾. Self-efficacy determines the behaviour of adolescents' patients with long-term diseases. Adolescents who have a sense of self-efficacy are more confident in disease treatment, which can benefit their physical abilities and lead to positive outcome expectations and a higher probability of achieving target metabolic control. Self-

efficacy has an impact on adolescents' life and is the key to the readiness of adolescents with a chronic condition for the transition to adult care. Adolescents who have a high level of self-efficacy are better able to cope with the obstacles of growing up and living with a chronic illness. ^(13,14).

Quality of life (QOL) is a multidimensional concept described by the World Health Organization as "an individual's perceptions of their position in life, in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns" ⁽¹⁵⁾. Adolescents with type 1 diabetes have lifestyle changes that can affect their entire family. However, management of type 1 DM is lifelong and challenging, considered an overwhelming demanding disease that affects their daily emotions and quality of life. As a result, QOL of diabetic adolescents must be considered, as they are required to live with and manage the disease for a lifetime ⁽¹⁶⁾.

Significance of the study

Adolescence is a critical transitional period from childhood into adulthood, especially for those with type 1 diabetes mellitus, because in addition to normal developmental processes, adolescents must acquire knowledge and skills to independently manage their health. In recent years, the

American Diabetes Association (ADA) has offered recommendations for health care delivery during this transitional period to improve the process of transition preparation. Despite the availability of national recommendations and resources, the problem of ineffective transition of care for adolescents with type ١ diabetes mellitus persists. However, challenges remain and evidence-based practices for preparing adolescents for adult health care are still emerging^(١٧,١٨).

In spite of the fact that transitional-care programs have grown in popularity as an increasing number of youth with chronic conditions have grown up to be empowered adolescents, only ١٧% of youth with special health care needs such as those with DM received appropriate transition planning support^(١٩). There is evidence that the process of transitioning from child to adult services is often associated with deterioration in health of adolescents with type ١ diabetes^(٢٠). Previous study among adolescents with chronic conditions and their caregivers reported the need for interventions to decrease the risks of deteriorating health status as adolescents move to adult services^(٢١). However, In Egypt, particularly in Benha city, no study has been conducted in diabetic outpatient

clinics to determine the effect of transition care program on health outcomes among adolescents with type ١ DM. As a result, preparing adolescents for entry into adult care settings through the implementation of these programs can reduce emergency admissions, improve self-efficacy, and promote long-term participation in high-quality diabetes care.

Operational definitions

-Transfer: It is an event or series of events through which adolescents with chronic medical conditions move their care from a pediatric to an adult healthcare environment^(٢٢).

-Transitional care: It is the provision of care that address the medical, psychosocial, and educational/vocational needs of adolescents as they move from being a dependent child towards an independent adult, with the aim of preparing adolescents to take control of their lives and health as adults^(٢٣).

Subjects and Methods

Aim of the study

This study aimed to evaluate the effect of transition care educational program on transitional readiness, self-efficacy and quality of life among adolescent with type ١ diabetes mellitus.

Research hypothesis

H_١: Adolescents' transitional readiness will be improved after implementation of transition care educational program.

H_٢: Adolescents' self-efficacy will be improved after implementation of transition care educational program.

H_٣: Adolescents' quality of life will be improved after implementation of transition care educational program.

H_٤: There will be a significant positive correlation between transitional readiness, self-efficacy and quality of life after implementation of transition care educational program.

Research design

Quasi- experimental (one-group pre/post-follow-up test) research design was utilized to accomplish the aim of this study.

Setting

The study was conducted in the outpatient diabetes clinic at health insurance hospital affiliated to the Egyptian Ministry of Health and population at Benha city. This clinic found in the first floor. It composed of two rooms and corridor, one room for routine check-up, and another room for follow-up and health education. While, the corridor contains chairs used by adolescents as

waiting area. The outpatient diabetic clinic was serving a large number of diabetic children/ adolescents and the number of patients visiting the clinic monthly was ranged from ٥٠ to ٦٠.

Subjects

A purposive sample of (٦٠) adolescents who received medical services from the previously mentioned setting were chosen after fulfilling the inclusion criteria

Inclusion criteria

- Adolescents aged ١٢–١٨ years who had type ١ diabetes mellitus.
- Adolescents agreed to participate in the study.
- Free from other chronic disease.
- Attends diabetes outpatient clinic appointments regularly.
- Able to independently fill in the questionnaire.

Exclusion criteria:

- Adolescents with severe neurocognitive and learning disabilities.

Tools of Data Collection:

Four tools were used for data collection.

Tool I: A structured interviewing questionnaire which developed by the researchers after reviewing the related and recent literatures. It consists of three parts:

Part (١): Characteristics of the studied adolescents: It includes age, gender, educational grade, residence and attending previous transition care program regarding diabetes mellitus.

Part (٢): Medical data of the studied adolescents: It includes duration of illness, number of insulin injection, number of hospital admission and Family history with diabetes.

Part (٣): Adolescents' knowledge, it was adapted from **Jensen et al., (٢٠١٧)^(٦) & Parfeniuk et al., (٢٠٢٠)^(٧)** to evaluate adolescents' knowledge about diabetes mellitus and transition care. It composed ٣٢ questions distributed as following:

Part ٣-A: knowledge about type ١ diabetes mellitus: It consists of ٢٦ multiple choice and true & false questions concerning definition of diabetes (٣ questions), causes and risk factor (٦ questions), signs and symptoms (٦ questions), complications (٤ questions) treatment (٣ questions) and nursing management of diabetes (٦ questions).

Part ٣-B: knowledge about transition care: It consists of ٦ multiple choice questions regarding definition of transition care, appropriate time to start transition, goals, components, and barriers.

Scoring system: Adolescents' responses were scored as follow: one score for correct answers and zero score for incorrect answers. The total score for each adolescent were calculated and converted into percent by dividing the adolescent total score by the maximum possible score. The total score for knowledge ranged from ٠ to ٣٢. The total knowledge score was categorized as the following; poor ($< ٦٠\%$), average ($٦٠ - < ٧٥\%$) and good ($\geq ٧٥\%$).

Tool II: Transition Readiness Assessment Questionnaire (TRAQ)

It was adopted from **Wood et al., (٢٠١٤)^(٢٤)** to assess adolescent readiness for transition to adult care. It includes ٢٠ items distributed at ٥ domains as managing medications (٤ items), appointment keeping (٧ items), tracking health issues (٤ items), talking with healthcare providers (٣ items) and managing daily activities (٢ items). Each item scored as five-point Likert scale ranging from ١ to ٥ and scored as follow:

Scoring system: The adolescents answer scored at a ٥-point Likert scale in which ١ = No, I do not know how, ٢ = No, but I want to learn, ٣ = No, but I am learning to do this, ٤ = Yes, I have started doing this and ٥ = Yes, I always do this when I need to. The total score ranged from ٢٠ to ١٠٠. Higher scores indicate high transition readiness.

Therefore, the transition readiness levels were categorized as the following low ($<60\%$), moderate ($60\% - 80\%$) and high ($\geq 80\%$).

Tool III: Self-Efficacy Questionnaire (SEQ)

It was adopted from **Muris, (2001)⁽²⁰⁾** to assess self-efficacy of adolescents. The instrument comprises three subscales; academic self-efficacy (Items 1, 4, 5, 10, 13, 16, 19, and 22), social self-efficacy (Items 2, 6, 8, 11, 14, 17, 20, and 23) and emotional self-efficacy (Items 3, 7, 9, 12, 15, 18, 21, and 24). Each subscale includes eight items. The instrument had 24 items in total and was scored on a 5-point Likert scale.

Scoring system: Each item was scored as follow: 1(not at all), 2(very unwell), 3(unwell), 4(well) to 5(very well), with a total possible score range from 24 – 120. A high score indicates a high level of self-efficacy. Accordingly, the self-efficacy levels were categorized as the following low ($<60\%$), moderate ($60\% - 80\%$) and high ($\geq 80\%$).

Tool IV: The Pediatric Quality of Life Inventory (PedsQoL 2.0) Diabetes Module

It was multi-dimensional, diabetes-specific instrument that was developed by **Varni et al., (2003)⁽²¹⁾** to assess adolescents quality

of life. This multidimensional instrument consists of 28-item grouped under 5 domains: diabetes symptoms (11 items), treatment barriers (4 items), treatment adherence (5 items), worry (3 items), and communication (5 items).

Scoring system: A five-point Likert response was used for adolescent self-report from 1= never a problem, 2= almost never a problem, 3= sometimes a problem, 4= often a problem to 5= almost always a problem). Items were reverse-scored and linearly transformed to a 1–100 scale, being (1=100, 2=90, 3=80, 4=70, and 5=60). Total scores ranged from 0 to 2800. Scale scores are computed as the sum of the items divided by the number of items answered. Higher scores indicated better QoL. So, QoL levels were categorized as the following low ($<60\%$), moderate ($60\% - 80\%$) and high ($\geq 80\%$).

Methods

-An official permission was obtained by submission of formal letters from the Dean of the faculty of Nursing, Benha University to the responsible authorities of the study setting to obtain their permission for data collection.

-Ethical Considerations

The study was approved by the Ethical Committee at the faculty of Nursing, Benha University. Verbal explanation of the study'

aim, and its benefits was performed by the researchers to adolescents included in the study sample. Oral consent was taken from subjects' parents and reassured them about confidentiality and anonymity of the study. Participants were informed about their right to withdraw from the study at any time without giving any reason.

- **Review** of the current local and international-related literature and theoretical knowledge of various aspects of the study using books, articles and magazines for full understanding and to get acquainted with the research problem and prepare the data collection tools.

- **Validity:** All tools were translated into Arabic by the researchers, and tested for content validity by five experts (two professors of pediatric nursing, Faculty of Nursing, Benha University and three professors from Faculty of Nursing, Ain Shams University. The recommended modifications were done and the final form was ready for use.

- **Reliability:** Internal consistency of the tools were analyzed using Cronbach's alpha coefficients and the value obtained from the structured interviewing questionnaire was ٠,٨٦, ٠,٨٧ for transition readiness assessment questionnaire, ٠,٨٨ for self-

efficacy scale and ٠,٧١ for PedsQoL ٣,٠ diabetes module.

- **Pilot study:** A pilot study was carried out on ٦ adolescents with type ١ diabetes mellitus, representing about ١٠% of the study sample to test the clarity and applicability of the tools of data collection and to estimate the length of time needed to fill the tools. Modifications were done and the subjects who shared in the pilot study were excluded from the main study sample.

Study framework

The framework of the study was carried out through the following four phases:

-**Assessment phase:** Once permission was granted to proceed with the study, the researchers started to prepare schedule for collection the data. The researchers visited the outpatient diabetes clinic two days a week (Sunday & Tuesday) in the morning shift from ٩ am to ١ am. The researchers interview the adolescents during a routine outpatient diabetes clinic appointment in the health insurance hospital. At the beginning of the interview the researchers introduced themselves, explained the study purpose briefly and the nature of the tools used for data collection. Parents and adolescents oral consent to participate in the study was taken. Then, the researchers distributed the tools (I,

II, III & IV) to all adolescents included in the study to collect baseline data. Each adolescent filled the tools individually. The time used for finishing each tool was ranged between ١٥-٢٠ minutes, according to their physical and mental readiness. Data were collected through three months, starting from July ٢٠١٩ up to the end of September ٢٠١٩.

-Planning phase: Based on the findings of the assessment phase (pre-test) and relevant review of literature the adolescents learning needs were identified, the objectives of the program were stated and the content was designed. Teaching methods were used by the researchers to attract adolescents' attention such as, modified lecture, brain storming, group discussion, demonstration, and re-demonstration. Teaching media included; power point presentation, colored handout prepared in simple Arabic language to receive the information easily. Also, the researchers offer gift card incentives for participation post-program and follow-up assessment.

-Implementation phase: Implementation of the educational program was carried out at the previously mentioned settings. The educational program consisted of ٥ consecutive sessions (two for theory & three for practical) and was implemented on a

small group basis over a period of ١٨ weeks. These sessions were being scheduled as two session every one week for duration of three weeks. Adolescents were divided to ٦ groups and ١٠ adolescents will be scheduled per group and the researchers included their parents during the sessions. Each session would last approximately ٦٠ minutes. Total duration of session was ٥ hours for each group. The session content will be guided by adolescents needs. The researchers start the session with group discussion, asking and answering question. **The first session** included overview about diabetes mellitus type ١ (definition of diabetes, signs and symptoms, causes, risk factors, complication, treatment and nursing management), **the second session** involved definition of transition care, its goal, barriers and transition-related topics, such self-care behaviors (healthy eating, regular physical activity, taking medication, reducing risks, diabetes problem solving and healthy coping), managing diabetes in school and away from home, completing all follow-up appointments, communicating effectively with peers who are in the same situation & healthcare providers and future planning for occupation/career. **The third session** concerned with applying steps of insulin administration. **The fourth session**

concerned with applying steps of blood-glucose monitoring and the **fifth session** concerned with performing steps of urine analysis for sugar and ketone bodied. The program was conducted at Sunday and Tuesday from ١٠ am to ١١am weekly and the sessions were repeated to all groups.

-Evaluation phase: The adolescents were evaluated by using same of pretest tools that conducted after three months and six months follow-up assessment which coincide with routine clinic visits.

-Statistical Analysis: Data were presented using SPSS ٢٠,٠ statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Friedman test used to compare means pre, post and follow-up. Reliability of the structured interviewing questionnaire was done using Cronbach's Alpha. In addition, correlation coefficient (r) test was used to estimate the close association between variables. P-values which were less than ٠,٠٥, ٠,٠٠١ were considered as statistically significant and highly significant respectively.

Results

Table ١ presented that slightly more than half (٥١,٧%) of adolescents were in the age group of ١٦ years and more, with a mean of $16 \pm 1,٧$ years old. Nearly two thirds (٦٥%) of adolescents were female and more than three quarters (٧٦,٧%) of them were in secondary school. Regarding to the adolescence's residence, two-thirds (٦٦,٧%) of them were from urban area and most of them (٩٦,٧%) did not attend any previous transition care program regarding diabetes mellitus.

Table (٢) proved that the majority of adolescents (٨٣,٣%) had type ١ diabetes mellitus from ٥ years and more with the mean duration of $٥,٤ \pm ٣,٢$ years and more than half (٦٠%) of them had insulin injection twice a day. More than three quarters (٧٦,٧%) of them had twice time of hospital admission and more than two thirds (٧٠. ٨%) of them had family history of diabetes mellitus from the ١st degree.

Figure (١) illustrated that nearly two thirds (٦٥%) of adolescents had poor knowledge in the pre-program phase. While, more than two thirds and two thirds (٧١,٧% & ٦٦,٧%) of them had good knowledge ٣ months post-program and ٦ months follow-up assessment respectively.

Table (٣) revealed that the highest mean score ($٦,٧ \pm ٢٨,٨$) of adolescents transition

readiness was talking with healthcare providers pre-program phase. In addition, this table proved that there was a highly statistical significant difference in all mean score of transition readiness domains 3 months post-program and 6 months follow-up assessment compared with the pre-program phase ($p=0.000$).

Figure (2) showed that majority (83.3%) of adolescents had low transition readiness in the pre-program phase. Moreover, majority and three quarters (81.9% & 90%) of them had high transition readiness 3 months post-program and 6 months follow-up assessment respectively.

Table (4) indicated that there was a highly statistical significant difference in all mean score of self-efficacy domains 3 months post-program and 6 months follow-up assessment compared with the pre-program phase ($p=0.000$).

Figure (3) showed that majority (80%) of adolescents had low self-efficacy in the pre-program. on the other hand, slightly more than three quarters and more than two thirds (76.6% & 91.9%) of them had high self-efficacy 3 months post-program and 6 months follow-up assessment respectively.

Table (5) demonstrated that there was a highly statistical significant difference in all mean score of quality of life domains 3

months post-program and 6 months follow-up assessment compared to the pre-program phase ($p=0.000$).

Figure (4) indicated that three quarters (75%) of adolescents had low quality of life in the pre-program. While, more than two thirds and nearly two thirds (70% & 60%) of them had high quality of life after 3 months and 6 months follow-up assessment respectively.

Table (6) displayed that there was a highly statistical significant positive correlation between the total transition readiness and total self-efficacy 3 months post-program and 6 months follow-up assessment ($p=0.000$). Again, this table showed that there was a highly statistical significant positive correlation between total self-efficacy and total quality of life 3 months post-program and 6 months follow-up assessment ($p=0.000$). Contrary, no significant correlation found between total transition readiness and total quality of life after 3 months and 6 months follow-up assessment.

Table (١): Distribution of Studied Adolescent According to their Characteristics (n=٦٠).

Adolescents' characteristics	Study sample n=٦٠	
	No	%
Age in years:		
- ١٢ < ١٤	١٢	٢٠,٠
- ١٤ < ١٦	١٧	٢٨,٣
- ≥ ١٦	٣١	٥١,٧
Mean \pmSD: ١٦ \pm ١,٧		
Gender:		
- Male	٢١	٣٥,٠
- Female	٣٩	٦٥,٠
Educational Grade		
- Primary school	٦	١٠,٠
- Preparatory school	٨	١٣,٣
- Secondary school	٤٦	٧٦,٧
Residence:		
- Rural	٤٠	٦٦,٧
- Urban	٢٠	٣٣,٣
Attending previous transition care program regarding diabetes mellitus.		
- Yes	٢	٣,٣
- No	٥٨	٩٦,٧

Table (٧): Distribution of Studied Adolescent According to their Medical Data (n=٦٠).

Medical data	Study sample n=٦٠	
	No	%
Duration of illness / years		
- < ٥	١٠	١٦,٧
- ≥ ٥	٥٠	٨٣,٣
Mean ±SD: ٥,٤±٣,٢		
Number of insulin injection:		
- One	٢٤	٤٠,٠
- Two	٣٦	٦٠,٠
Number of hospital admission		
- Once	٦	١٠,٠
- Twice	٤٦	٧٦,٧
- Three or more	٨	١٣,٣
Family history with diabetes		
- Yes	٤٨	٨٠,٠
- No	١٢	٢٠,٠
- If yes, it's relation: (n=٤٨)		
١ st degree	٣٤	٧٠,٨
٢ nd degree	١٤	٢٩,٢

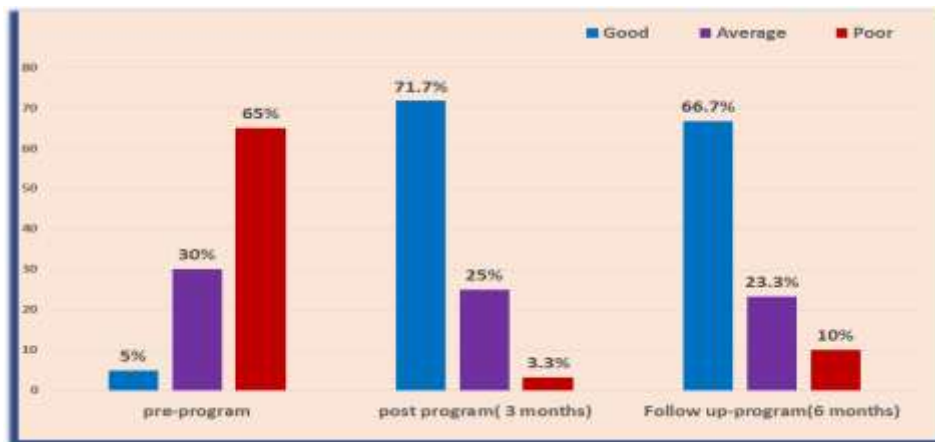


Figure (١): Comparison of the Studied Adolescents' Knowledge Levels thorough the Educational Program Phases (n= ٦٠).

Table (٧): Mean Scores of Diabetic Adolescents' Readiness for Transition thorough the Educational Program Phases (n= ٦٠).

Adolescent readiness for transition	Maximum Score	Pre-program	Post- program (After ٣ months)	Follow up program (After ٦ months)	Friedman Test	P -value
		X±SD	X±SD	X±SD		
Managing medications	٢٠	٥,٣±١٠,٤	١٧,٦±٩,٩	١٦,٤±٨,٧	٦,٤٧٥ *
Appointment keeping	٣٥	٥,٥±١٠,٩	٢٨,٨±١١,٢	٢٤,٢±١١,٨	٥,٩٢٣ *
Tracking health issues	٢٠	٢,٩±٩,٦	١٥,٥±١٠,٧	١٠,٢±٧,٨	٦,٨٨٦ *
Talking with healthcare providers	١٠	٦,٧±٢٨,٨	٩,٢±٢٤,٣	٩,١±٢٧,٤	٦,٤١٧ *
Managing daily activities	١٥	٦,٠±١٠,٥	١١,٦±١١,٢	١٠,١±١٣,٣	٥,٠٨٣ *
Total	١٠٠	٢٤,٤±١٠,٠	٨٤,٧±١٢,٥	٧٠,٠±١١,٧	٩,٠٦١ *

**highly significant at P<٠,٠٠١



Figure (٧): Comparison of the Studied Adolescents' Readiness for Transition Levels through the Educational Program Phases (n=٦٠).

Table (٤): Mean Scores of Diabetics Adolescents' Self-efficacy thorough the Educational Program Phases (n= ٦٠)

Adolescent self-efficacy domains	Maximum Score	Pre-program	Post program (After ٣ months)	Follow up program (After ٦ months)	Friedman Test	P – value
		X±SD	X±SD	X±SD		
Academic self-efficacy	٤٠	٧,٧±١٠,٩	٣٤,٨±١١,٢	٢٩,٢±١١,٨	١١,٩٤٥ **
Social self-efficacy	٤٠	١١,٩±٩,٦	٣٦,٥±١٠,٧	٣١,١±٧,٨	١١,٠٢٠ **
Emotional self-efficacy	٤٠	١٥,٥±٨,٣	٣٨,٩±٩,٦	٣٧,٠± ١٨,٧	١٤,٧٥ **
Total	١٢٠	٣٥,١±١٠,٠	١١٠,٢±١١,٢	٩٧,٣±١٤,٨	١٥,٩١ **

**highly significant at P<٠,٠٠١



Figure (٣): Comparison of the Studied Adolescent's Self-efficacy Levels through the Educational Program Phases (n=٦٠).

Table (٥): Mean Scores of Diabetic Adolescents' Quality of Life thorough the Educational Program Phases (n= ٦٠).

Pediatric quality of Life domains	Pre-program	Post- program (After ٣ months)	Follow up program (After ٦ months)	Friedman Test	P - value
	X±SD	X±SD	X±SD		
Diabetes symptoms	٦٢,١ ± ١٥,٧	٨٧,٦ ± ١٢,٣	٧٧,٨ ± ٣,٨	١٤,٧٥ **
Treatment barriers	٥٩,٩ ± ٢٠,٥	٨٣,٢ ± ٢٠,٩	٧٦,٧ ± ٤,٦	٧,٦١٤ **
Treatment adherence	٦٠,١ ± ٣,٠	٨٠,٨ ± ١٥,٥	٧٤,٧ ± ١٧,١	٥,٦١٧ **
Worry	٥٨,٤ ± ٢٤,٢	٧٩,٤ ± ١٤,٦	٧٣,٧ ± ٢٠,٩	٧,٨٦١ **
Communication	٦١,٩ ± ٢٥,٩	٨٢,٢ ± ٢,٧٧	٧٧,٧ ± ٢٥,٨	٩,١٤٤ **

**highly significant at P<٠,٠٠١

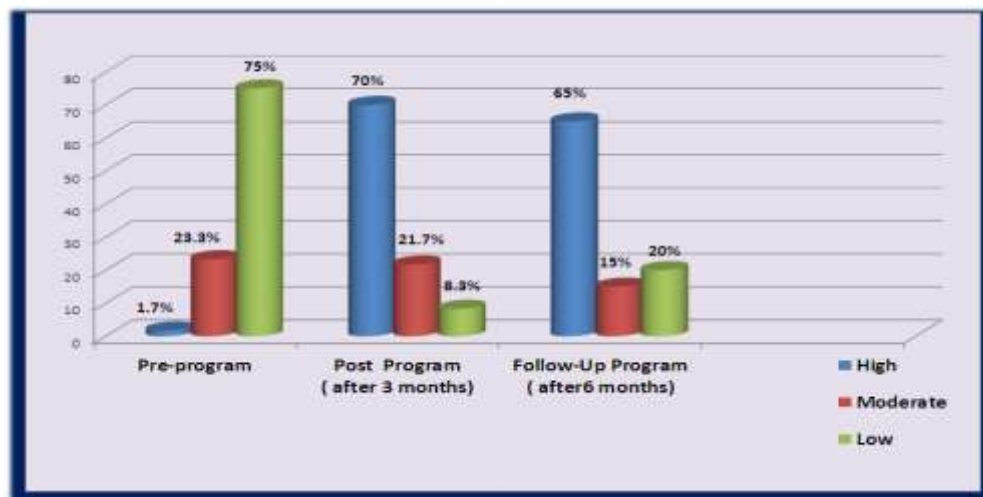


Figure (٤): Comparison of the Diabetes Adolescents' Quality of Life Levels thorough the Educational Program Phases (n=٦٠).

Table (٦): Correlation Matrix between Total Adolescents 'Transitional Readiness, Total Self- efficacy, and Total Quality of Life Post-Program and Follow-up Assessment (n=٦٠).

Items		Transitional readiness Post-program	Self-efficacy Post-program	Quality of life Post-program	Transitional readiness Follow-up	Self-efficacy Follow-up	Quality of life Follow-up
Transitional readiness Post-program	r		.٦٩٢	.٠١٦			
	P-value		.٠٠٠**	.٩٢٣			
Self-efficacy Post-program	r	.٦٩٢		.٨٤٠			
	P-value	.٠٠٠**		.٠٠٠**			
Quality of life Post-program	r	.٠١٦	.٨٤٠				
	P-value	.٩٢٣	.٠٠٠**				
Transitional readiness Follow-up	r					.٧٣٧	.٣٠٤
	P-value					.٠٠٠**	.٠٧٠
Self-efficacy Follow-up	r				.٧٣٧		.٥٩٠
	P-value				.٠٠٠**		.٠٠٠**
Quality of life Follow-up	r				.٣٠٤	.٥٩٠	
	P-value				.٠٧٠	.٠٠٠**	

** Correlation is significant at the .٠٠١ level (٢-tailed).

Discussion

Type 1 diabetes has a tremendous impact on all aspect of an adolescent's life. Adolescence is a period during which adult behaviors are set, and thus affords a wide scope of opportunity to promote healthy behaviors which has an impact on the health burden of tomorrow's adults. During this developmental period, adolescent patients experience significant changes in living situation, education and health care delivery including transferring from pediatric to adult health care. The integration of the core principles of adolescent medicine with self-management of chronic conditions, plus appropriate health service structures and healthcare providers training, are considered imperative for effective transitional care (Sawyer 2012)⁽²⁷⁾.

The present study aim was to evaluate the effect of transition care educational program on transitional readiness, self-efficacy and quality of life among adolescent with type 1 diabetes mellitus.

The current study finding revealed that nearly two thirds of studied adolescents were female. This finding comes in agreement with what was reported by the **American Diabetes Association**, (2013)⁽²⁸⁾ that

diabetes was common among females than males. This finding is in accordance with the study conducted in Turkish by **Ozturk et al.**, (2017)⁽²⁹⁾ who determined psychometric properties of a Turkish version of the diabetes management self-efficacy scale in 203 adolescents with type 1 diabetes mellitus and found that 66.7% of the adolescents were girls.

The finding of the current study showed that two thirds of adolescents living in the urban areas, this may because of the highest percentage of the adolescents visiting the outpatient diabetic clinic are from the Benha city. This finding is slightly consistent with **Hassan et al.**, (2019)⁽³⁰⁾ who assess the prevalence of diabetes mellitus among school-age children and found that 80% of studied children were living in urban areas and 20% in rural areas. Contrary, this finding is contradicted with **Niba et al.**, (2017)⁽³¹⁾ who conducted a cross-sectional study in Cameroon on 96 children/adolescents with type 1 diabetes and found that nearly two third of participants from rural areas. This contradiction is attributed to that Cameroon is considered as one of the developing countries.

Concerning the mean duration of type 1 diabetes mellitus among the studied adolescents, the current study result revealed

that the mean duration of the disease was 0.4 ± 3.2 years. This finding is agreed with the study done in Kuwait by **Abdul-Rasoul et al.**, (2013)⁽²¹⁾ who assessed quality of life of children and adolescents with type 1 diabetes and found that the mean duration of type 1 diabetes for adolescents was 0.37 ± 2.8 years. In contrast, this finding is incongruent with **Cho & Kim**, (2021)⁽²²⁾ who carried out a cross-sectional descriptive study among 111 participants with type 1 DM and found that the mean duration of type 1 diabetes mellitus was 10.2 ± 4.2 years. Also, the present study finding revealed that more than two thirds of the studied adolescents had positive family history of diabetes mellitus from the 1st degree. This could be explained by the family history of diabetes was a predisposing factor associated with the occurrence of diabetes. This finding comes in agreement with **Krischer et al.**, (2017)⁽²³⁾ who stated that risk of developing type 1 diabetes is 8–10-fold higher in first-degree relatives.

The current study finding showed that most of the studied adolescents did not attend any previous transition care educational program. This finding might be due to the healthcare providers especially nurses don't value the need for discussion of specific

transition topics with adolescents and their parents. This finding is similar with the study carried out in US by **Lebrun-Harris et al.**, (2018)⁽¹⁴⁾ who assessed transition planning among US youth with and without special health care needs and found that the vast majority of US youth are not receiving transition preparation program. The present study result indicated that nearly two thirds of the studied adolescents had poor level of knowledge pre-transition educational program. This result could be attributed to most of the studied adolescents did not attend any previous transition care educational program and lack of administrative support to conduct this program in the outpatient clinic. This finding suggests a need for an intensive promotion of transition care education for adolescents with type 1 diabetes in the outpatient clinic. This finding is consistent with the study done in Egypt by **Abolwafa et al.**, (2017)⁽²⁴⁾ who studied the effect of educational program on improving knowledge and practice for 20 adolescences with type 1 diabetes and reported low mean score of overall knowledge among diabetic adolescents at the pre-test phase. While, this finding disagreed with the study conducted in Portugal by **Flora and Gameiro**, (2016)⁽²⁵⁾ who evaluated self-care and

knowledge of adolescents with type ١ diabetes mellitus and found that the adolescents has a good level of knowledge regarding diabetes at the baseline assessment.

In this study, the current finding demonstrated that more than two thirds and two thirds of the studied adolescents had good level of knowledge three months post-program and six months follow-up assessment. The researchers rationalize this result as adolescents were eager to learn more about their illness and how to manage it properly, in addition to the simple transition program sessions and the use of different approach of active learning during the implementation of the program such as group discussions. This finding is in accordance with **Tobin, (٢٠١٥)^(٢٦)** who assessed the transitional care of patients with type ١ and ٢ diabetes at Southern California and demonstrated that there was a significantly higher mean score of overall knowledge after three months of transitional care program implementation compared to the pre-program ones. Again, this finding is supported by **Mackie et al., (٢٠١٤)^(٢٧)** who assessed healthcare transition for youth with chronic disease and reported that there is a significant improvement of knowledge

scores for the intervention group at one and six months after transition intervention.

Surprisingly, the present study finding showed that the highest mean score of transition readiness among the adolescents was related to talking with healthcare-providers pre-transition educational program. In other words, adolescents with diabetes mellitus perceive themselves as more capable to express their feelings to physicians or nurses and to answer their questions. This finding is similar with the study by **Lapp and Chase, (٢٠١٨)^(٢٨)** who assessed readiness to transition to adult healthcare among adolescents with chronic disease and reported that communication with healthcare providers was the domain with the highest mean score at the baseline assessment.

The current study finding revealed that the majority of studied adolescents had low transition readiness level pre-transition educational program. This could be explained by the desire of adolescents to act independently during transition period allow them to be engaged in mismanagement behaviors as unhealthy diet, missing blood tests, missing insulin shots and this may result in problems in the management of chronic conditions and decreasing their readiness for transition to adult care. This

finding is in agreement with **Chan et al.**, (2019)⁽¹⁴⁾ who measured the transition readiness of 90 adolescents with type 1 diabetes and found that the adolescents had low transition readiness level at the baseline assessment. Contrary, this finding disagreed with **Alwadiy et al.**, (2021)⁽¹⁵⁾ who investigated the association of self-efficacy and transition readiness in 54 adolescents with type 1 diabetes and found that less than half of them were transition-ready to adult care at the baseline assessment.

The present study finding indicated that the majority and three quarters of the studied adolescents achieved higher transition readiness three months post-program and six months follow-up assessment. This could be attributed to the transition care program help in increasing adolescents' capability regarding self-care management and thus enhancing their self-efficacy which is considered an important factor in increasing readiness for transition to adult care. This finding is in accordance with the study by **Gabriel et al.**, (2017)⁽¹⁶⁾ who evaluated the outcome evidence for structured pediatric to adult health care transition interventions and reported that readiness for transition to adult care was significantly improved after structured transition interventions at 12 months follow-up and the most common

positive outcomes were increased visit attendance and less time between the last pediatric care visit and the initial adult care visit. Again, this finding is supported with **Hankins et al.**, (2012)⁽¹⁷⁾ who found higher rates of successful transfer and higher rates of attendance in adult clinics among adolescents who participate in the transition programs than those who did not participate in the programs at three and 12 months after exit from pediatric care.

The current study finding showed that the majority of studied adolescents have low self-efficacy level pre-transition educational program. This could be due to the adolescents are still developing many of the skills necessary for independent diabetes management, and recognizing the need for ongoing family support to ensure successful management. This finding is in harmony with **Gutierrez-Colina et al.**, (2020)⁽¹⁸⁾ who assessed 44 young adult with type 1 diabetes preparing to transition to adult care and found that young adults had lower self-efficacy at the baseline assessment. On the other hand, this finding is contradicted with **Survonen et al.**, (2019)⁽¹⁹⁾ who examined psychosocial self-efficacy in 189 adolescents with type 1 diabetes and stated that the adolescents self-efficacy level was good at the baseline assessment.

The current study results illustrated that more than three quarters and more than two thirds of the studied adolescents had higher self-efficacy level three months post-program and six months follow-up assessment. This could be possible due to the extensive knowledge and support provided by the transition program which helps adolescents face challenging situations that is important in the self-management of chronic disease and this contributed to higher self-efficacy level. This finding is congruent with the study conducted by **Huang et al.**, (٢٠١٤)^(٤٥) who evaluated the effect of a technology program on transition to adult care among adolescents with chronic disease and reported that more than three quarters of adolescents had higher self-efficacy scores and confidence in managing their own health and health care in the intervention group at both two month and eight-month follow-ups. In support of this finding, the study of **Hejazi, et al.**, (٢٠١٩)^(٤٦) who assessed the impact of education based on self-efficacy theory on health literacy, self-efficacy and self-care behaviors in ٧٠ patients with diabetes and found that the experimental group showed a higher total mean scores of self-efficacy after

implementation of the educational intervention.

Interestingly, the present study finding showed that three quarters of the studied adolescents perceived their quality as low pre-transition educational program. This might due to the adolescents difficulties faced in everyday life and the inability to cope with the disease. This finding is parallel with the study conducted in Egypt by **Bassam**, (٢٠١٩)^(٤٧) who assessed the relationship between compliance and quality of life among adolescents with diabetes mellitus type ١ and found that the studied adolescents perceived their quality as low at the baseline assessment. Additionally, this finding is in accordance with **Cramm et al.**, (٢٠١٣)^(٤٨) who investigated quality of life of adolescents with diabetes over time and found that Adolescents perceived low quality of life over time at the baseline assessment. While, this finding is incongruent with **Ozazicioglu et al.**, (٢٠١٧)^(٤٩) who determined quality of life of children and adolescents with type ١ diabetes and reported that adolescents perceived quality of life as good level.

Moreover, after implementation of the transition care educational program, the current study finding illustrated that more

than two thirds and nearly two thirds of the studied adolescents perceived their quality of life as high three months post-program and six months follow-up assessment. This could be attributed to that the transition educational program helps in increasing adolescents' capabilities to manage the disease independently and improving their ability to cope with stressful life events. This finding is in agreement with **Naylor et al., (٢٠١٣)^(٥٠)** who evaluated transitional care as a modality to improve patient health status and quality of life post-hospitalizations and showed that transitional care program is beneficial in improving quality of life post ٢ months of intervention.

Self-efficacy is associated with the beliefs of an individual about their ability to produce certain outcomes (**Bandura, ٢٠١٢)^(٥١)**. The present study finding indicated that there is a significant positive correlation between total self-efficacy and total readiness for transition to the adult care three months post-program and six months follow-up assessment. This means that adolescents with type ١DM who had a high level of self-efficacy had higher readiness for transition to adult care. This finding is consistent with the findings of previous studies conducted by **Carlsen et al., (٢٠١٧)^(٥٢)** and **Varty & Popejoy, (٢٠٢٠)^(٥٣)** who examining

readiness for the transition to adult care and self-efficacy among adolescents with chronic diseases and found a significant positive association between total self-efficacy with total readiness for transition to adult care. This finding suggests that self-efficacy should be considered as an important factor in the planning of preparatory transition programs for adolescents with type ١ DM.

However, the present study finding showed that, there is a significant correlation between total self-efficacy and total quality of life three months post-program and six months follow-up assessment. This finding is in agreement with **Cho & Kim, (٢٠٢١)^(٥٤)** who reported that quality of life was positively correlated with self-efficacy for diabetes self-management. Again the study of **Uzark et al., (٢٠١٩)^(٥٥)** who investigated quality of life and readiness for the transition to adult care among adolescents with a chronic disease and determined that adolescents' self-efficacy level were positively associated with their quality of life. From the researchers points' of view, this result indicated that the self-efficacy has a significant effect on quality of life among diabetic adolescents and an adolescent's quality of life is associated with skills for

disease self-management during the preparation for the transition to adult care.

As regards the correlations between quality of life and transition readiness three months post-program and six months follow-up assessment. The present study result showed that there is no significant correlation between total quality of life and total readiness for the transition to adult care. This finding is in accordance with a previous study by **Gangemi et al.**, (٢٠٢٠)^(٥٥) who evaluated quality of life and transition readiness among adolescents with chronic diseases and found no significant correlation between total readiness for the transition to adult care and quality of life. In contrast, this finding is inconsistent with previous study by **Sheng, et al.**, (٢٠١٨)^(٥٦) who assessed transition readiness and quality of life of Chinese adolescents with chronic diseases and identified a positive association between total readiness for transition and quality of life.

Conclusion:

It can be concluded that the research hypotheses were achieved and the transition care educational program was a good strategy in improving transition readiness, self-efficacy and quality of life among adolescents with type ١ diabetes mellitus.

Likewise, there were a significant positive correlation between total transitional readiness with total self-efficacy and total self-efficacy with total quality of life three months post-program and six months follow-up assessment.

Recommendations:

In the light of the findings of the current study, the following recommendations are suggested:

١. Continuous implementation of transitional care program for adolescents with type ١ diabetes mellitus with the importance of follow-up in order to assess its long-term effects.
٢. Integrate transitional care education sessions into routine clinic visits for adolescents with type ١ diabetes mellitus.
٣. Nurses who deal with diabetic adolescents should incorporate the transitional care education into their daily practice to achieve positive health outcomes.
٤. Encourage diabetic adolescents to discuss their concerns with health care providers, their family and peers to facilitate their readiness for transition to adult care.
٥. Self-efficacy and quality of life levels should be taken into account when planning preparation programs for transition to adult care for diabetic adolescents.

Further Research

١. Assessing the relationship between compliance and readiness for transition to adult care among adolescents with type ١ diabetes mellitus.

٢. Conducting more prospective researches to evaluate factors affecting the transition readiness among adolescents with type ١ diabetes mellitus.

References

١. International Diabetes Federation. IDF Diabetes Atlas. ٨th ed., Brussels, Belgium: International Diabetes Federation, ٢٠١٧.

٢. Al Bahnasy R , Mahrous O , El Shazli H , Gabr H , Ibrahim R , Soliman S . Prevalence of diabetes mellitus and impaired glucose tolerance among adolescents in Menoufia governorate, Egypt. Menoufia Medical Journal. ٢٠١٧; ٣٠(١): ٦٩.

٣. International Diabetes Federation. Diabetes Atlas, introduction, ٢٠١٣. Retrieved from: http://www.idf.org/sites/default/files/EN_٦E_Atlas_Full_٠.pdf.

٤. Patterson C, Guariguata L, Dahlquist G, Soltész G, Ogle G, Silink M. Diabetes in the young – A global view and worldwide estimates of numbers of children with type ١ diabetes. Diabetes Research and Clinical Practice. ٢٠١٤; ١٠٣: ١٦١–١٧٥. <https://doi.org/1٠.1٠1٦/j.diabres.٢٠١٣.١١.٠٠٥>.

٥. Hassan F , Khatab A , El-Fotoh W , Ganh I . Prevalence of diabetes mellitus among school-age children. Menoufia Medical Journal. ٢٠١٩; ٣٢(١): ٣٠٥.

٦. Jensen P , Paul G , LaCount S, Peng J, Spencer C , Higgins G , Ardoin S . Assessment of transition readiness in adolescents and young adults with chronic health conditions. Pediatric Rheumatology journal. ٢٠١٧; ١٥(١): ١-٧.

٧. Parfeniuk S, Petrovic K, MacIsaac P , Cook K , Rempel G. Transition readiness measures for adolescents and young adults with chronic health conditions: a systematic review. Journal of Transition Medicine. ٢٠٢٠; ٢(١).

٨. Cooley W, Sagerman P, American Academy of Pediatrics. Supporting the health care transition from adolescence to adulthood in the medical home. Pediatrics ٢٠١١; ١٢٨: ١٨٢–٢٠٠.

٩. Castillo C, Kitsos E. Transitions from pediatric to adult care. Global Pediatric Health. ٢٠١٧; (٤): ١–٢. <https://doi.org/1٠.11٧٧/٢٣٣٣٧٩٤X1٧٧٤٤٩٤٦>.

١٠. Amed S, Nuernberger K, McCrea P. Adherence to clinical practice guidelines in the management of children, youth, and young adults with type ١ Diabetes—A

prospective population cohort study. J Pediatric. 2013;163(5): 43–8.

11. Sheehan A, While A, Coyne I. The experiences and impact of transition from child to adult healthcare services for young people with type 1 diabetes: a systematic review. Diabetic Medicine 2010; 22: 44–58.

12. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review. 1977; 84: 191–215. <https://doi.org/10.1037/0033-290X.84.2.191>.

13. Resnick B. Theory of self-efficacy, Middle range theory for nursing. New York, NY: Springer Publishing Company, 2014; pp. 197–220.

14. Van Staa A, van der Stege H, Jedeloo S, Moll H, Hilberink S. Readiness to transfer to adult care of adolescents with chronic conditions: Exploration of associated factors. The Journal of Adolescent Health. 2011; 48(3): 290–302. <https://doi.org/10.1016/j.jadohealth.2010.07.009>.

15. WHO QoL Group. Study protocol for the World Health Organization Project to develop a Quality of Life Assessment Instrument (WHOQOL). Qual. Life Res. 1993; (2): 103–109.

16. Keklik D, Bayat M, Başda S. Care burden and quality of life in mothers of children with type 1 diabetes mellitus. Int. J. Diabetes Dev. Ctries. 2020; 40: 431–435.

17. Khardori, R. Type 1 diabetes mellitus. Practice essentials. Medscape, 2017. Retrieved from emedicine.medscape.com/article/117739-overview.

18. Chiang, J, Maahs D, Garvey K. Type 1 diabetes in children and adolescents: a position statement by the American Diabetes Association. Diabetes Care 2018; 41:2026–2044.

19. Lebrun-Harris L, McManus M, Ilango S. Transition Planning Among US Youth With and Without Special Health Care Needs. Pediatrics. 2018; 142(4):2018-0194.

20. Lotstein D, Seid M, Klingensmith G, Case D, Lawrence J, Pihoker C. Transition from pediatric to adult care for youth diagnosed with type 1 diabetes in adolescence. Pediatrics 2013; 131(4):1062–70.

21. Latzman R, Majumdar S, Bigelow C, Elkin T, Smith M, Megason G. Transitioning to adult care among adolescents with sickle cell disease: a transitioning clinic based on patient and caregiver concerns and needs.

International Journal of Child Health and Adolescent Health ٢٠١١; ٣(٤): ٥٣٧–٤٥.

٢٢. Knauth A, Verstappen A, Reiss J, Webb G. Transition and transfer from pediatric to adult care of the young adult with complex congenital heart disease. *Cardiol Clin* ٢٠٠٦; ٢٤:٦١٩–٦٢٩.

٢٣. Meleis A. Transitions Theory: Middle-Range and Situation-Specific Theories in Nursing Research and Practice. New York, NY: Springer Publishing Company, ٢٠١٠.

٢٤. Wood D, Sawicki G, Miller M, Smotherman, C, Lukens-Bull K, Livingood W, Kraemer D. Transition Readiness Assessment Questionnaire (TRAQ): its factor structure, reliability, and validity. *Academic Pediatric* ٢٠١٤;١٤:٤١٥–٤٢٢.://doi.org/١٠.١٠١٦/j.acap.٢٠١٤.٠٣.٠٠٨.

٢٥. Muris P. A brief questionnaire for measuring self-efficacy in youths. *Journal of Psychopathology and Behavioral Assessment*. ٢٠٠١; ٢٣(٣): ١٤٥–١٤٩. <https://doi.org/١٠.١٠٢٣/A:١٠١٠٩٦١١١٩٦٠٨>.

٢٦. Varni J, Burwinkle T, Jacobs J, Gottschalk M, Kaufman F, Jones K. The PedsQL in type ١ and type ٢ diabetes: reliability and validity of the Pediatric Quality of Life Inventory Generic Core Scales and type ١ Diabetes Module. *Diabetes Care*. March ٢٠٠٣; ٢٦(٣):٦٣١–٦٣٧

٢٧. Sawyer S, Afifi R, Bearinger L, Blakemore S, Dick B, Ezech A. Adolescence: a foundation for future health. *Lancet* ٢٠١٢; ٣٧٩(٩٨٢٦):١٦٣٠–٤٠.

٢٨. American Diabetes Association. Complete guide to diabetes, ٤th ed., Koncept, Inc.;٢٠١٣, p. ٧

٢٩. Ozturk C, Ayar D, Bektas M. Psychometric properties of a Turkish version of the Diabetes Management Self-Efficacy Scale in Adolescents with Type ١ Diabetes Mellitus, *Children's Health Care*. ٢٠١٧; ٤٦(٤): ٣٣١-٣٤٣, DOI: ١٠.١٠٨٠/٠.٢٧٣٩٦١٥,٢٠١٦,١١٦٣٤٩٢

٣٠. Niba L , Aulinger B, Mbacham W , Parhofer K . Predictors of glucose control in children and adolescents with type ١ diabetes: results of a cross-sectional study in Cameroon. *BMC research notes*.٢٠١٧; ١٠(١): ١-١٠.

٣١. Abdul-Rasoul M, AlOtaibi F, Abdulla A, Rahme Z, AlShawaf F. Quality of Life of Children and Adolescents with Type ١ Diabetes in Kuwait. *Med Princ Pract* ٢٠١٣; ٢٢ : ٣٧٩–٣٨٤.

٣٢. Cho M, Kim M. What Affects Quality of Life for People with Type ١ Diabetes : A Cross-Sectional Observational Study. *International Journal of Environmental*

Research and Public Health. 2021; 18 (7623): 1-12.

33. Krischer J, Liu X, Lernmark A. The influence of type 1 diabetes genetic susceptibility regions, age, sex, and family history on the progression from multiple autoantibodies to type 1 diabetes : a TEDDY study report. Diabetes. 2017; 66(12):3122–3129.

34. Abolwafa N, Ahmed S, Aly S. Effect of educational program on improving knowledge and practice for adolescences with type 1 diabetes. International journal of advanced nursing studies. 2017; 6(1): 36-44.

35. Flora M, Gameiro M. Autocuidado dos adolescentes com diabetes mellitus tipo 1: conhecimento acerca da doença. Revista de Enfermagem Referência, 2016; 4(8):17-26.

36. Tobin E. Transitional Care of Adult Patients with Diabetes Following Hospitalizations. Unpublished Doctor Thesis of Nursing Practice. University of San Diego. Faculty of the Hahn School of Nursing and Health Science, 2010. <https://digital.sandiego.edu/dnp/34>

37. Mackie A, Islam S, Magill-Evans J, Rankin K, Robert C, Schuh M. Healthcare transition for youth with heart disease: a clinical trial. Heart 2014; 100:1113–8.

38. Lapp V, Chase S. How do youth with cystic fibrosis perceive their readiness to transition to adult healthcare compared to their caregivers' views? Journal of pediatric Nursing. 2018; 43:104–110.

39. Chan J , Soni J, Sahni D, Mantis S, Boucher-Berry C. Measuring the transition readiness of adolescents with type 1 diabetes using the Transition Readiness Assessment Questionnaire. Clinical Diabetes. 2019; 37(4): 347-352.

40. Alwadiy F, Mok E, Dasgupta K, Rahme E, Frei J, Nakhla M. Association of Self-efficacy, Transition Readiness and Diabetes Distress with Glycemic Control in Adolescents with Type 1 Diabetes Preparing to Transition to Adult Care. Canadian Journal of Diabetes. 2021; 40(5): 490–490

41. Gabriel P, McManus M, Rogers K, White P. Outcome evidence for structured pediatric to adult health care transition interventions: a systematic review. J Pediatr. 2017; 188:263–269.

42. Hankins J, Osarogiagbon R, Adams-Graves P, McHugh L, Steele V, Smeltzer M, Anderson S. A Transition Pilot Program for Adolescents With Sickle Cell Disease. Journal of Pediatric Health Care. December 2012; 26:40–49. doi: 10.1016/j.pedhc.2012.06.004.

٤٣. Gutierrez-Colina A, Corathers S, Beal S, Baugh H, Nause K, Kichler J. Young Adults with Type ١ Diabetes Preparing to Transition to Adult Care: Psychosocial Functioning and Associations with Self-Management and Health Outcomes. *Diabetes Spectrum* ٢٠٢٠ Aug; ٣٣(٣): ٢٥٥-٢٦٣. <https://doi.org/١٠.٢٣٣٧/ds١٩-٠٠٥٠>.
٤٤. Survonnen A, Salanterä S, Nanto-Salonen K, Sigurdardottir A, Suhonen R. The psychosocial self-efficacy in adolescents with type ١ diabetes. *Nursing Open*. ٢٠١٩;٦:٥١٤-٥٢٥. <https://doi.org/١٠.١٠٠٢/nop٢,٢٣٥>.
٤٥. Huang J, Terrones L, Tompane T, Dillon L, Pain M, Gottschalk M. Preparing Adolescents with Chronic Disease for Transition to Adult Care: A Technology Program. *Pediatrics* ٢٠١٤;١٣٣: ١٦٣٩-٤٦.
٤٦. Hejazi S, Peyman N, Tajfard M, Esmaily H. The impact of education based on self-efficacy theory on health literacy, self-efficacy and self-care behaviors in patients with type ٢ diabetes. *Iranian Journal of Health Education and Health Promotion*. ٢٠١٩; ٥(٤): ٢٩٦-٣٠٣.
٤٧. Bassam S. The Relationship between Compliance and Quality of Life among Adolescents with Diabetes Mellitus Type ١. *American Journal of Nursing Research*. ٢٠١٩; ٧(٦): ١٠٥٧-١٠٦٨.
٤٨. Cramm J, Strating M, Nieboer A. The Importance of General Self-Efficacy for the Quality of Life of Adolescents with Diabetes or Juvenile Rheumatoid Arthritis over Time: A Longitudinal Study among Adolescents. *Frontiers in Pediatrics*. ٢٠١٣; ١(٤٠): ١-٨.
٤٩. Özyazıcıoğlu N, ÜnsalAvdal E, Sağlam H. A determination of the quality of life of children and adolescents with type ١ diabetes and their parents. *International Journal of Nursing Sciences*. ٢٠١٧; ٤(١): ٩٤-٩٨.
٥٠. Naylor M, Bowles K, McCauley K, Maccoby M, Maislin G, Pauly M, Krakauer R. High-value transitional care: Translation of research into practice. *Journal of Evaluation in Clinical Practice*. ٢٠١٣; ١٩: ٧٢٧-٧٣٣. doi:١٠.١١١١/j.١٣٦٥-٢٧٥٣.٢٠١١.٠١٦٥٩.X
٥١. Bandura A. On the functional properties of perceived self-efficacy revisited. *Journal of Management*, ٢٠١٢; ٣٨(١): ٩-٤٤. <https://doi.org/١٠.١١٧٧/٠١٤٩٢.٦٣١١٤١٠.٦.٦>.
٥٢. Carlsen K, Haddad N, Gordon J, Phan B L, Pittman N, Benkov K, Keefer L. Self-efficacy and resilience are useful predictors of transition readiness scores in adolescents with inflammatory bowel diseases. *Inflammatory Bowel Diseases*. ٢٠١٧; ٢٣(٣): ٣٤١-٣٤٦.

<https://doi.org/10.1097/MIB.0000000000000103>.

٥٣. Varty M, Popejoy L. A systematic review of transition readiness in youth with chronic disease. *Western Journal of Nursing Research*. ٢٠٢٠; ٤٢(٧):٥٥٤–٥٦٦. <https://doi.org/10.1177/0193945091987047>.

٥٤. Uzark K, Afton K, Yu S, Lowery R, Smith C, Norris M. Transition readiness in adolescents and young adults with heart disease: Can we improve quality of life? *The Journal of Pediatrics*. ٢٠١٩; ٢١٢: ٧٣–٧٨. <https://doi.org/10.1016/j.jpeds.2019.04.060>.

٥٥. Gangemi A, Abou-Baker N, Wong K. Evaluating the quality of life and transition of adolescents and young adults with asthma in an inner city. *Medical Research Archives*. ٢٠٢٠; ٨(١). <https://doi.org/10.18103/mra.v8i1.2031>.

٥٦. Sheng N, Ma J, Ding W, Zhang Y. Family management affecting transition readiness and quality of life of Chinese children and young people with chronic diseases. *Journal of Child Health Care*. ٢٠١٨; ٢٢(٣): ٤٧٠–٤٨٥. <https://doi.org/10.1177/1367493017703712>.

Relation between Perceived Social Support and psychological Stress among patients with Depressive disorder

Amina Morsy Elmonir Abd Elhady^١, Zebeda Abd Elgwad Hessain Elshreif^٢, Mai Abd El Raoaf Eissa^٣, Aml Ibrahim Sabra^٤

^١Nursing Specialist, Kafer El Sheikh Fever Hospital, Egypt,

^{٢,٤}Assistant Professor of Psychiatric and Mental Health Nursing Faculty of Nursing, Tanta University, Egypt.

^٣Professor and Head of Neuro psychiatry Department Faculty of Medicine , Tanta University, Egypt.

Abstract: Persons with depression live under the dark shadow of sustained stress of mental illness. Perceived social support significantly predicts the patient's ability to cope with stress and support network has been found to reduce the negative effects of stress. **Aim of this study:** It was conducted to determine the relation between perceived social support and psychological stress among patients with depressive disorders. **Design:** This study followed a descriptive research design. **Setting:** The study was conducted at Neuro psychiatry inpatient departments of Tanta University Hospital. **Subject:** A convenience sample of ١٥٠ patients was diagnosed with depressive disorder in the above previously mentioned setting was selected. **Tools:** Two tools of were used to carry out this study **Tool (١)** Multidimensional Scale of Perceived Social Support **Tool (٢)** Perceived Stress Scale (PSS). **Results:** Majority of the studied subjects had poor level of perceived social support and moderate level of perceived stress and there was a non- significant relation between perceived stress level and perceived social support level. **Conclusion:** The study concluded that, social support has important in reducing stress among patients with depression. In other words patient who has social support are more likely to experience stress. **Recommendation:** Developing of social skill training program for patients with

depressive disorders. Develop training program for nurses about the importance of social support to patients and their families during difficult times.

Keywords: Depressive disorders, Psychological stress, Social support.

Introduction

Depression is the most common mental health condition in the general population. It is characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration. Severe form, depression can lead to suicide and increased risk of mortality.^(١) The global prevalence of depression has been increasing in recent decades and the estimated lifetime prevalence of depression is ١٠% of general population and in clinical setting; its prevalence may reach as high as ٢٠%. Depression is a significant determinant of quality of life and survival, accounting for approximately ٧٥%. Diagnosed depression and ١٢% of all mental hospital admissions. Indeed, depression is the leading cause of disability and is a major contributor to the disease burden worldwide.^(٢)

Persons with depression live under the dark shadow of sustained stress of mental illness.

Because of significant and remarkable stressors that persons with depression experience such as chronicity and illness management, unemployment, loss of productivity, rejection from society, isolation, homelessness and stigma, the risk of patient's vulnerability to experience stress is becoming high. Stress has been defined as an unpleasant state of emotional and physiological arousal that people experience in situations that they perceive as dangerous or threatening to their well-being.^(٣)

After summarizing the results obtained from nearly twenty years of research about the relationship between stress and depression, **Kessler (٢٠١٠)** indicated that stress is closely related with depression and stress intensity and degree of depression have a closed relationship.^(٤) Stress has a vital role in exacerbated depression symptoms, relapse rates, decreased self-esteem, and non-adherence to prescribed medication resulting in reducing the likelihood of patient's recovery and patient's integration

into community .Consequently stress is a considerable great problem among individuals with depression and has a stamped negative impact on the wellbeing of them. Therefore, imperious attention for stress issues among patients with depression is emerged. ^(٢, ٦)

Social support generally refers to the various types of support that people receive from others, which lead them to believe that they are cared for, are esteemed and valued, and are part of a network of communication and mutual obligations. Social support can be divided into four categories: informative support (the provision of information, suggestions, and guidance), instrumental support (the provision of financial assistance or material aid), emotional support (the provision of empathy, affection, trust, acceptance, and care), and companionship support (the provision of a sense of social belonging). Social support is provided by networks consisting of family, relatives, friends, neighbors, and coworkers, especially when the interaction is positive. ^(٧)

A good social support can provide protection for an individual under stress and it has been demonstrated to lower the risk of depression by assisting individuals in coping with everyday hardships and has common gaining function on maintaining an

individual's good emotional experience. Perceived social support significantly predicts the patient's ability to cope with stress and support network has been found to reduce the negative effects of stress. Person's knowing that they are valued, cared and esteemed by others are an important psychological factor in helping them to forget the negative aspects of their lives and thinking more positively about their environment. ^(٨)

Social support may play a role at two different points in the causal chain linking stress to illness. First, perceived support may intervene between the stressful event (and expectation of that event) and stress reaction by attenuating or preventing a stress appraisal response. That is, the perception that others can and will provide necessary resources may redefine the potential for harm posed by a situation and/or bolster one's perceived ability to cope with imposed demands, and hence prevent a particular situation from being appraised as highly stressful. ^(٩)Second, adequate support may intervene between the experience of stress and the onset of the pathological outcome by reducing or eliminating the stress reaction by directly influencing physiological processes. Support may alleviate the impact of stress appraisal by providing a solution to the

problem, by reducing the perceived importance of the problem.^(١١)

Significant of the study

Person with depression encounters by many stressors and perceived highly stress and finds difficulty in social support. Social support has been shown to promote mental health and acts as a buffer against stressful life events. Social support is derived from a network of people drawn from family, friends and community. A lack of social support is a determinant of mental health problems including depressive symptoms and has a negative impact on quality of life for patients. Social support helps people to cope with stress. Being surrounded by people who are caring and supportive helps people to see themselves as better capable of dealing with the stresses that life brings, so that, one of the main psychiatric nursing objectives is to reducing patients' stress through enhancing social support provided to the patient. In order to do this the nurse should first assess patients' stress and social support and identify the problems within social support.^(١١, ١٢)

Subjects and Method

Aim of the Study

Was to determine the relation between perceived social support and psychological

stress among patients with depressive disorders.

Research question

What is the relation between perceived social support and psychological stress among patients with depressive disorders?

Study Design: A descriptive design was utilized in the study.

Research setting: This study was conducted at Neuro psychiatry inpatient departments of Tanta University Hospital which affiliated to the Ministry of Higher Education. It has a capacity of (٣٢) beds divided into two wards for male (١٧beds) and two wards for female (١٥ beds). It provides health care services to three governorates, namely Gharbya, El-Menofeya, and Kafr- El-sheikh.

Subjects:

A convenience of ١٥٠ patients was diagnosed with depressive disorder in the above previously mentioned setting selected according to Epi- Info software statistical package created by World Health Organization and Center for Disease Control and Prevention, Atlanta, Georgia, USA version ٢٠٠٢. The criteria used for sample size calculation were as follows:

- Total number of admission in one year is ٢٥٠ diagnosed by depression.
- ٩٥% confidence limit. The sample size

based on the previously mentioned criteria was found at n=١٥٠ for the study.

Inclusion Criteria of the Study

- Adult patient
- Patient diagnosed with major depressive disorder or depressive episode of bipolar disorder
- Patient who able to communicate and participate in the study

Exclusion Criteria of the Study

- Patient diagnosed with mentally retarded or other psychiatric disorder.
- Patient in a acute phase of depression.
- Chronic medical illness that may affect psychological state of the patient such as (kidney diseases, liver diseases, chronic heart disease and cancer).
- Patient with neurological illness and head trauma.

Tools of the study

Two tools were used to collect data for this study.

Tool I: Multidimensional perceived social support scale (MSPSS)

It was developed by (Zimet et al ١٩٨٨) ^(١٣). It is a brief research tool designed to measure perception of social support from ٣ sources: Family, Friends, and Significant other. The scale is comprised of a total of ١٢ items, the response rated with ٧ point likert scale for each subscale from very strongly

disagree=١ to very strongly agree=٧. The scale is divided into three subscales, they named:

١-Significant other subscale: It contained ٤ items ١, ٣, ٥, & ١٠. For example (There is a special person who is around when I am in need).

٢-Family subscale: It contained ٤ items ٣, ٤, ٨, & ١١. Like statement (My family really tries to help me).

٣-Friends subscale: It contained ٤ items ٦, ٧, ٩, & ١٢. Like statement (My friends really try to help me).

Scoring system: - The minimum and maximum score that can be acquired from each total score is ١٢ and ٨٤ respectively, and ٤ and ٢٨ respectively for each subscale.

- ١٢-٤٨ as low perceived social support.
- ٤٩-٦٨ as moderate perceived social support.
- ٦٩-٨٤ as high perceived social support.

Tool (II):- Perceived Stress Scale (PSS) ١٠

items. It was developed by Cohen et al, ١٩٨٣^(١٤). It is a self-report measure designed to assess patient's perception about the degree of a given support in daily life is considered stressful. It consists of ١٠ Items are rated on a ٥-point Likert scale of occurrence. (١ = never, to ٤ = very often). There was reverse scores for questions ٤, ٥, ٧, and ٨. The minimum and maximum score

that can be acquired from each total score is ٠ to ٤٠ with higher scores indicating higher perceived stress is taken as ٠-١٣ as low level of stress, ١٤-٢٦ as moderate level of stress and ٢٧-٤٠ as considered high level of stress.

-The tools of the study was supported by covering sheet about socio- demographic and clinical characteristic of the patient: - It

Method

The study was accomplished according to the following steps

-An official letter was obtained to conduct the study from the responsible authorities after clarifying the purpose of the study to gain permission and cooperation and it approved from ethical committee.

-Ethical considerations throughout the study process were be considered:

-This study was approved by the research and ethical committee at Faculty of Nursing Tanta University.

-Informed consent to participate in the study was obtained from the patient.

- Assure the participants about their privacy and confidentiality of the obtained data.

-Emphasizing the right to withdraw from the study at any time.

-Nature of the study didn't cause any harm or pain to subjects of the study.

-Anonymity of the subjects was assured.

was developed by the researcher to elicit socio demographic data about the patient it contained ٩ questions (sex, age, marital status, level of education and occupation as well as clinical data which includes, history of disease, frequency of follow up, duration of illness, previous history of admission, medication and other medical illness).

-Tools of the study were translated into Arabic language by the researcher and were tested for content validity by a jury of five experts in Psychiatric and Mental Health Nursing Field.

- A pilot study was conducted on (١٠٪) of subjects after taking their oral approval and explanation the purpose of the study to check and ensure the clarity of the tools, identify obstacles and problems that may be encountered during actual data collection. Subject of pilot study were selected randomly and were excluded later from the study sample.

-Reliability was tested for both tools of the study by using Cronbach's Alpha (٠,٨٣٢, ٠,٩٠١) respectively.

Actual data collection procedure

-After obtaining the permission to conduct the research from the required authorities, the patients who met the inclusion criteria were invited to participate in the study after being informed of the nature of the study.

-The actual data collection was carried out by interviewing the study subjects on an individual basis and each interview was range about 30-40 minutes. The duration of data collection taken seven months, starting from November 2019 to April 2020.

Statistical analysis

The collected data were organized, tabulated and statistically analyzed using SPSS software statistical computer package version 26. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison was done using Chi-square test (χ^2).

Correlation between variables was evaluated using Pearson and Spearman's correlation coefficient r . A significance was adopted at $P < 0.05$ for interpretation of results of tests of significance (*). Also, a highly significance was adopted at $P < 0.01$ for interpretation of results of tests of significance (**).

Results

Table (1) represents distribution of the studied patients according to their socio-demographic characteristics. It was noted that 28.0% of the studied patients were in the age group between 30 to 40 years old with a Mean \pm SD = 39.16 \pm 12.84. Most of the

studied patients were male 82.0%. As Regards marital status 32.0% of the studied patients were married while 8.0% of them were divorced. Concerning the educational level 38.0% of the studied patients were read and write and 13.3% of them had university education. Regarding the occupation 48.0% of the studied subjects were not worked and lived in rural area. Regarding the co-habitation 92.0% of the studied patients were live with family. Concerning having children 91.3% of them hadn't children. As regards the income, the majority (80.0%) of the studied patients reported that their income was not enough.

Table (2) shows clinical characteristics of studied patients, It was clarified majority of studied subject (60.0 %) suffered from depression less than 6 years. As regard having previous hospital admissions 49.3% of the studied patients had previous hospital admissions. 44.3% of them having (1-3) times of admission, while 4.2% of the studied patients having (4-6) times of admission.

Regarding last hospitalization most of the studied patients (49.8%) had last hospitalization less than 6 months and the majority (40.0%) of the studied patients had involuntary admission. According to family history of depression, it was founded that

6.7% of the studied patients had family history of depression.

Figure (1) illustrates total mean scores of perceived social support subscales of studied patients. It showed that total mean \pm SD score was (42.89 ± 10.38) in which Mean \pm support. It showed that majority of the studied subjects (54%) had poor level of perceived social support, while (30.3%) of them had moderate level of perceived social support and only 15.7% had high level of perceived social support.

Figure (3) illustrates distribution of the studied patients according to level of stress. It showed that majority of the studied subjects (50%) had moderate level of perceived stress, while (24%) of them had high level of perceived stress and (26%) had low level of perceived stress.

Table (3) illustrates correlation between perceived social support and perceived stress score among studied subjects. The statistical table showed that there was a non-significant relation between perceived stress level and perceived social support level and its domains with ($p = 0.087$, $p = 0.048$ and $p = 0.963$) respectively.

SD score (14.09 ± 0.89) was for significant other subscale. Mean \pm SD score for family and friends social support subscale were (10.37 ± 1.70 and 13.43 ± 0.90) respectively.

Figure (٧) illustrates of the studied patients according to their level of perceived social support. Table (٤) Clarifies relationship between perceived social support and socio-demographic characteristics among studied patients. It was noticed that, there was significant relationship between perceived social support and items of socio-demographic characteristics except gender, occupation, place of residence and income ($P= ٠,٠٧٢$, $P= ٠,٣٩٣$, $P= ٠,٥٧١$ and $P= ٠,٤٣٦$) respectively.

Tables (5) Clarifies relationship between perceived stress and socio-demographic characteristics among studied subjects. It was noticed that, there was non-significant relationship between perceived stress and items of socio-demographic characteristics except gender and educational level ($P=3,206, **, 0.0005$ and $P=6,270, **, 0.0003$) respectively.

Table (١): Distribution of The Studied Patients Regarding Sociodemographic Characteristics.

Socio demographic Characteristics	The studied patients (n=١٥٠)	
	N	%
Age (in years)		
▪ (< ٢٥)	١٨	١٢,٠
▪ (٢٥-< ٣٥)	٣٨	٢٥,٣
▪ (٣٥-< ٤٥)	٤٢	٢٨,٠
▪ (٤٥-< ٥٥)	٢٩	١٩,٣
▪ (٥٥-< ٦٥)	١٥	١٠,٠
▪ (≥ ٦٥)	٨	٥,٣
Range	(١٨-٧٠)	
Mean ± SD	٣٩,١٦±١٢,٨٤١	
Sex		
▪ Male	١٢٣	٨٢,٠
▪ Female	٢٧	١٨,٠
Marital status		
▪ Single	٦١	٤٠,٧
▪ Married	٤٨	٣٢,٠
▪ Widow	١٧	١١,٣
▪ Divorced	١٣	٨,٧
▪ Separated	١١	٧,٣
Educational level		
▪ Illiterate	٢٩	١٩,٣
▪ Read and write	٥٧	٣٨,٠
▪ Secondary school	٤٤	٢٩,٣
▪ University	٢٠	١٣,٣
Occupation		
▪ Not work	١١٨	٧٨,٧
▪ Work	٣٢	٢١,٣
Place of residence		
▪ Urban	٣٢	٢١,٣
▪ Rural	١١٨	٧٨,٧

Co-habitation		
▪ Alone	١٤	٩,٣
▪ Father/Mother/brothers	٧٩	٥٢,٧
▪ Wife/Husband/Boys	٥٧	٣٨,٠
Having children		
▪ No	٧٧	٥١,٣
▪ Yes	٧٣	٤٨,٧
Income		
▪ Not enough	١٢١	٨٠,٧
▪ Enough	٢٩	١٩,٣

Table (٢): Distribution of The Studied Patients According to Clinical Characteristics.

Clinical characteristics	The studied patients (n=١٥٠)	
	N	%
Duration of the disease (in years)		
▪ (< ٥) year	٩١	٦٠,٧
▪ (٥-١٠) year	٣٧	٢٤,٧
▪ ١٠ year or more	٢٢	١٤,٧
Having previous hospital admissions	١١٩	٧٩,٣
▪ Yes	٣١	٢٠,٦
▪ No		
In case of yes.		
Number of previous hospital admissions	٩٢	٧٧,٣
▪ (١-٣) times	٣٠	٢٥,٢
▪ ٤ times	٥	٤,٢
▪ (٥-٧) times	٢٣	١٩,٣
▪ more than ٧ times		
Last hospitalization		
▪ <٦ months	٩٥	٧٩,٨
▪ (٦-١٢) months	٢٩	٢٤,٣
▪ >١٢ months	٢٦	٢١,٨
Mode of admission		
▪ Voluntary	٤٤	٢٩,٣
▪ Involuntary	١٠٦	٧٠,٧
Family history of depression		
▪ Yes	١٠	٦,٧
▪ No	١٤٠	٩٣,٣

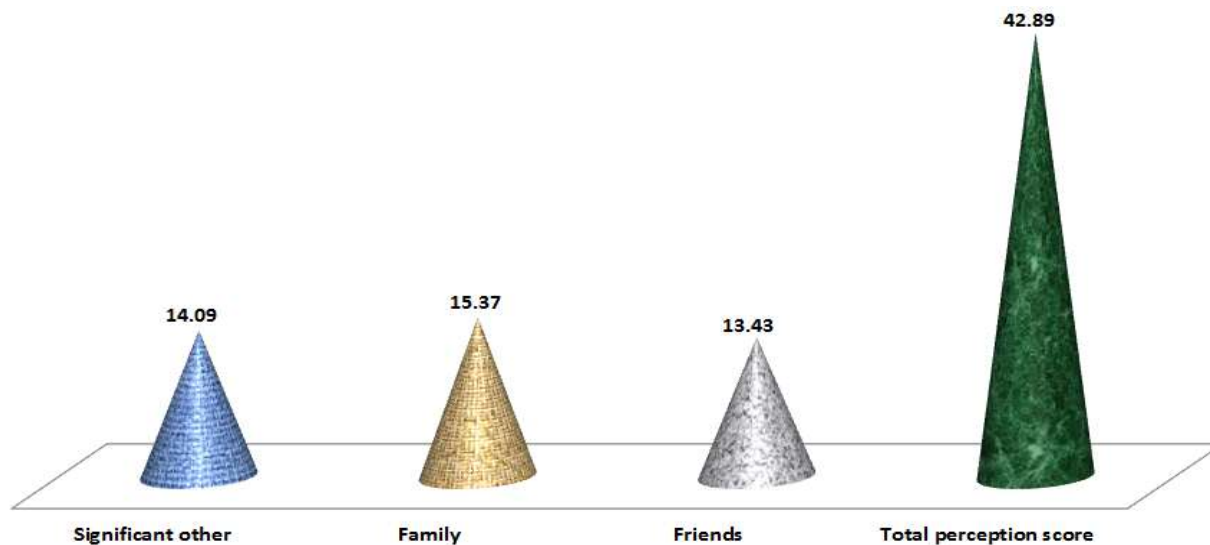


Figure ١: Total mean scores of perceived social support subscales of studied patients.

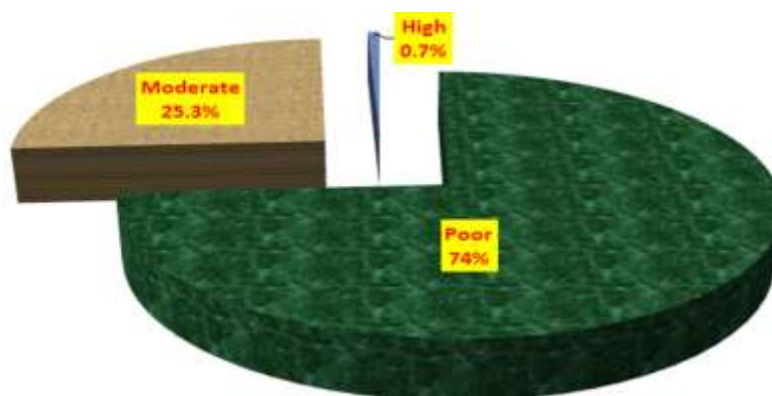


Figure ٢: Distribution of level of perceived social support scale among studied patients.

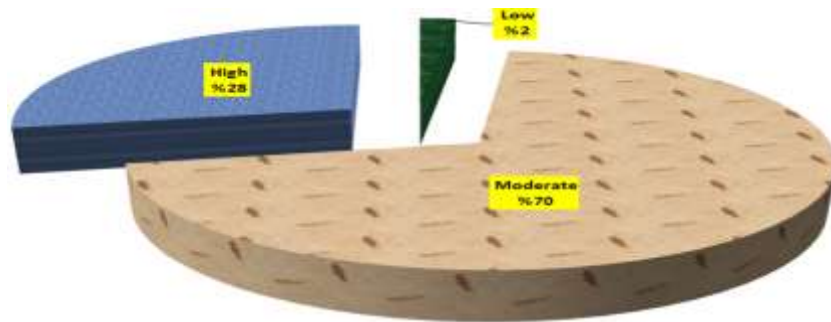


Figure ٣: Distribution of the studied patients according to level of perceived stress.

Table (٣): Correlation between Perceived Social Support and perceived stress among studied subjects.

Perceived Social Support domains	Total Perceived Stress level	
	R	P
١. Significant other	-٠,٠٤٥	٠,٥٨٧
٢. Family	٠,٠٤٩	٠,٥٤٨
٣. Friends	-٠,٠٠٢	٠,٩٨٥
Total	-٠,٠٠٤	٠,٩٦٣

Table (٤): Relationship between Perceived Social Support and Socio-demographic characteristics of the studied patients.

socio-demographic Characteristics	The studied patients (n=١٥٠) Perceived Social Support		
	Mean	SD	T P
Age (in years)			
▪ (< ٢٥)	٤٤,١٧	٩,٠٧٦	
▪ (٢٥-< ٣٥)	٤٦,٣٧	٩,٩٣٦	
▪ (٣٥-< ٤٥)	٤٤,٢١	١٠,٧٤٧	٣,٨٨٠
▪ (٤٥-< ٥٥)	٤٠,٩٧	١٠,٥١٤	٠,٠٠٣*
▪ (٥٥-< ٦٥)	٣٨,٢٠	٧,٤٥٧	
▪ (≥ ٦٥)	٣٢,٢٥	٨,٣٢٨	
Sex			
▪ Male	٤٣,٦٠	١٠,٧٥٠	٣,٢٩٢
▪ Female	٣٩,٦٣	٧,٨٥٥	٠,٠٧٢
Marital status			
▪ Single	٤٨,٠٠	١١,١٣١	
▪ Married	٤٠,٠٠	٧,٣٧٤	
▪ Widow	٣٥,١٨	٨,٣٦١	٨,٧٤٨
▪ Divorced	٣٩,٩٢	٩,٠٠٤	٠,٠٠٠*
▪ Separated	٤٢,٥٥	٩,٢٢٣	
Educational level			
▪ Illiterate	٣٧,٢٨	٧,٥٤٥	
▪ Read and write	٤٢,٩٥	١١,٣٦٦	٤,٤٦٧
▪ Secondary school	٤٥,٩١	١٠,٠٤٨	٠,٠٠٥*
▪ University	٤٤,٢٠	٨,٩٨٣	
Occupation			
▪ Not work	٤٢,٥١	١٠,٦٧٧	٠,٧٣٣
▪ Work	٤٤,٢٨	٩,٢٢٢	٠,٣٩٣
Place of residence			
▪ Urban	٤٣,٨١	١٠,١٤٢	٠,٣٢٢
▪ Rural	٤٢,٦٤	١٠,٤٧٢	٠,٥٧١
Co-habitation			
▪ Alone	٣٧,٦٤	٨,٥٨١	
▪ Father/Mother/brothers	٤٦,٥٤	١١,٣٤٤	١٢,٠٢٤
▪ Wife/Husband/Boys	٣٩,١١	٧,٠٧٣	٠,٠٠٠*
Having children			
▪ No	٤٦,٤٨	١٠,٨٨٩	٢١,٥٨٨
▪ Yes	٣٩,١٠	٨,٣٣٢	٠,٠٠٠*
Income			
▪ Not enough	٤٢,٥٦	١٠,٦٩٥	٠,٦١١
▪ Enough	٤٤,٢٤	٨,٩٨٧	٠,٤٣٦

Table (٥): Relationship between Perceived stress and socio-demographic characteristics of the studied subjects.

socio-demographic Characteristics	The studied patients (n=١٥٠)		
	Perceived stress		
	Mean	SD	T P
Age (in years)			
▪ (< ٢٥)	٢٤,٦٧	٦,٦٦٠	
▪ (٢٥-< ٣٥)	٢٥,٠٣	٤,٦٩٣	
▪ (٣٥-< ٤٥)	٢١,٨٨	٥,٥٥٣	١,٩٩٢
▪ (٤٥-< ٥٥)	٢٣,٧٩	٥,٣٤١	٠,٠٨٣
▪ (٥٥-< ٦٥)	٢١,٢٠	٤,٧٩٩	
▪ (≥ ٦٥)	٢٢,٦٣	٨,٤١٧	
Gender			
▪ Male	٢٢,٨٢	٥,٧١٢	٦,٢٧٥
▪ Female	٢٥,٧٨	٤,٧٤٢	٠,٠١٣*
Marital status			
▪ Single	٢٣,٦١	٥,٦٤٩	
▪ Married	٢٣,٤٠	٥,١٥٦	
▪ Widow	٢١,٨٢	٨,٢١٠	٠,٣٨٣
▪ Divorced	٢٣,٣٨	٤,٦٨٢	٠,٨٢٠
▪ Separated	٢٤,٠٩	٤,٥٠٥	
Educational level			
▪ Illiterate	٢١,٤٥	٦,٢٣٧	
▪ Read and write	٢٢,٥٨	٥,١٦١	٣,٢٠٦
▪ Secondary school	٢٤,٩٥	٦,١٣٤	٠,٠٢٥*
▪ University	٢٤,٨٠	٣,٧٣٦	
Occupation			
▪ Not work	٢٣,١٧	٥,٦٠٠	٠,٥٨٤
▪ Work	٢٤,٠٣	٥,٨٧٨	٠,٤٤٦
Place of residence			
▪ Urban	٢٤,٣٤	٤,٨٢٣	١,٢٥٢
▪ Rural	٢٣,٠٨	٥,٨٤٥	٠,٢٦٥
Co-habitation			
▪ Alone	٢٤,٢٩	٦,٥٦٨	
▪ Father/Mother/brothers	٢٣,٤٩	٥,٧٤٩	٠,٣٧٢
▪ Wife/Husband/Boys	٢٢,٩٣	٥,٣٣٨	٠,٦٩٠
Having children			
▪ No	٢٣,٠٠	٥,٧١٩	٠,٦١٧
▪ Yes	٢٣,٧٣	٥,٥٩٣	٠,٤٣٣
Income			
▪ Not enough	٢٣,٢١	٥,٤٦٦	٠,٤٢٠
▪ Enough	٢٣,٩٧	٦,٤٣٤	٠,٥١٨

Discussion

Social support may alleviate the impact of stress appraisal by providing a solution to the problem and by reducing the perceived importance of the problem. It provides faith to the individual and leads people to cope with the stress-filled events more effectively^(١٥).

One of the most devastating penalties of severe mental illnesses is the interruption of interpersonal relationships. This can be speculated by the finding of the current study which stated that majority percent of the studied patients had poor social support. Along with the same line Egyptian study conducted by **Harfush& Gemeay** (٢٠١٧)^(١٦) in the same setting of the current study and by using the same tool to assess level of social support among psychiatric patients, they concluded that seventy four percent of their respondents had poor social support. Additionally this finding is also consistent with results of another Egyptian study by **Sabra& Mohamed** (٢٠١٩)^(١٧) they concluded that more than one third of studied subjects had poor social support. Along with the same line a study conducted by **Munikanana et al** (٢٠١٧)^(١٨) **stated** that about ٧٢% of the respondents had poor perceived social support. Unfortunately, these studies denote that people with mental illness have low social support at nationally and internationally levels.

This may be attributed to more than one explanation. First, patients become generally apathetic, inactive; having poverty of speech, socially withdrawn and showed disinhibited behaviors which typically are stable features of patients with depression. Second, People are often hesitant to frequent contact with those patients under such conditions because they find such distortions in normal behaviors which lead to stigma against mental illness more upsetting and impose considerable pressure to deal with. Third, patients may also refuse assistance as they are not adversely affected by social isolation.

Family members are considered the most important part of social support for individuals with a psychiatric disorder. This goes with the results of the current study, where the highest sense of social support was found in the family. This may be because most of the patients in this study live with their families, which explain the higher level of social support received from family. Moreover, it is not surprising considering it in Egyptian culture, responsibilities towards the immediate family members have the highest priority, and precede loyalty toward other parties such as friends.

Furthermore, more than half of studied subjects live in rural area which characterized by empathetic & own individualities in terms

of belief systems. It is a stigma for rural family to leave their patient cared by another person except in emergency and hospitalization. Furthermore, the majority of the patients in the present study live with their family and about more than half of them were not worked so family is considered the main source of support by giving practical assistance such financial support, reminding taking prescribed medication and accessing to professional seeking help. This finding is consistent with prior qualitative findings that described “helping with medication” to be an important type of instrumental support for persons with mental illness as mentioned by **Chronister-elal**, (2015)⁽¹⁴⁾.

On the other side, a very small percent of the studied subjects perceive friends as social support and reported friends as the latest source of social support .Again as mentioned previously stigma and discrimination and multiple and long hospitalization may b have a great part for this result. In the same stream **Harfush& Gemeay** (2017)⁽¹⁵⁾ found that the highest sense of social support among their respondents was found in family subscale and lowest scale for friends. In the same stream, **McGuire** (2018)⁽¹⁶⁾ found that the majority of patients received social support from their families. This result contradicted with **Ota** (2017)⁽¹⁷⁾ reported that the majority of

patients received social support from their friends.

Regarding the factors affecting social support, the present study showed that social support was significantly higher with employed, single, having enough of income, and living with their family. This may be explained by the employment enriched social network and social support. These results are in accordance with **Harfush& Gemeay** (2017)⁽¹⁵⁾ explained it by the fact that employed attained a better social relationship, had aspirations to live like normal people, financially satisfied, and had better global functioning . This result contradicted with **Adams R** (2015)⁽¹⁸⁾, **Naseri N** (2018)⁽¹⁹⁾ and **Hou, F** (2019)⁽²⁰⁾ found that married patients in the sample group were received better social support from their husbands and sons.

Level of education is considered among factors affecting level of social support. Patients who are highly educated are significantly more social than illiterate patients. This may due to education level be able to affect one's perceptions of others and person can find help by sharing experiences with other and people who have a higher educational level may have better communication ability and interpersonal skills so that they can utilize support resources actively. This study supported by **Duman M** (2016)⁽²¹⁾ found that the higher perceived

social support mean scores were obtained by patients who were graduates of middle/high school or higher level of education. This result contradicted with **Costa-Requena** (٢٠١٦) ^(٢٦) showed that education level has no effect on the level of social support received.

Regarding level of perceived stress of study patients, the present study showed that seventy percent of the studied patients had moderate level of perceived stress; while more than one quarter of them had high level of perceived stress, this result may be due to psychiatric patients had feeling of harassment, overload, irritability, lack of joy, fatigue, worries and tension, fear from stigma of their disease could lead to mood disorders, undesirable living situations and lose of job. This result was in accordance with **Zhang** (٢٠١٥) ^(٢٧) conducted study on people with depression had high level of perceived stress. This result contradicted with **Rankin** (٢٠١٧) ^(٢٨) found that majority of the patients had poor level of perceived stress.

The present study showed about third of studied patients are younger ٢٥-٤٥ years which the age of productivity and self-achievement and majority of them female, have children, low level educated and don't have partner (most of patients are separated), so all of these factors increase patients' vulnerability to have moderate level of perceived stress. These results come in

congruent with **Nikolich-Zugich** (٢٠٢٠) ^(٢٩) found that older adults (٥٥-٦٥) years reported a lower level of perceived stress. In the same stream **Shanahant** (٢٠٢٠) ^(٣٠) found that people aged between ١٨ and ٢٥ or ٢١-٣٨ years old would demonstrate higher rates of stress.

The current study revealed that there was a negative non- significant relation between perceived stress level and perceived social support. This may be due to social support being able to reduce the negative effects of stressful life events via the supportive actions of others that enhance coping performance. Social support plays vital role in providing information, sympathy, and assurance, financial and practical assistance for patients during times of stress, or through the belief that support is available, which leads to the appraisal of potentially threatening situations as less stressful and increase life enjoyment. This explanation is supported by **Mobasherietal.,** (٢٠١٤) ^(٣١) stated that for people with mental illness social support serves a protective role during times of stress by enhancing adaptive coping behaviors. This result was in accordance with **Berrios** (٢٠١٦) ^(٣٢), **Gonzalez** (٢٠١٧) ^(٣٣) and **Akbari** (٢٠١٨) ^(٣٤) found that there was a negative non- significant relation between perceived

stress level and social support domains of significant other

The present study showed that people who live in an urban had high level of perceived stress. This result may be due to that the urban environment had the lack of connection with others, a lack of means to keep in contact with loved ones increase the perception of vulnerability and isolation, affecting the perception of stress. This result was agreement with **Recchi** (2020) ⁽³⁰⁾ found that there is evidence that spending confinement in a densely populated city is a risk factor, affecting people's stress. Conversely, this result was disagreement with **Rodríguez-Rey** (2020) ⁽³¹⁾ found that people who live in rural or urban environments, those who spent confinement in residential/suburban environments had lower levels of stress.

The current study revealed that there was statistically significant relationship between perceived stress and income. This result may be due to depressive disorders caused an acute financial strain, taking into account that some people may have lost their jobs, seen their income plummet or been furloughed this may lead to difficulties in obtaining basic supplies and protective equipment and may increase stress levels. This result was supported by **Mazza, C** (2020) ⁽³²⁾ found that both income

and work conditions may be risk factors for stress.

The present study showed that patient who was separated had high level of perceived stress. This may be due to separated person loosed source of social support because stigma from psychiatric disorders and also loosed income source and patient was worried more about their daily life. This result agreed with **Vicario-Merino**(2020) ⁽³³⁾ found that people who were separated or divorced demonstrated similar levels of control of stress during confinement to those who were married, living with a partner, or single.

The current study revealed that patients who were secondary school and higher education level had high level of perceived stress. This result may be based on greater awareness and understanding of the risks of the illness and have coping skill and more experience in dealing with stressor events in daily life .this result supported with by **Wei W** (2020) ⁽³⁴⁾ found that people with higher levels of education had greater levels of depression and stress. Conversely, this result was disagreed with **Brooks** (2020) ⁽³⁵⁾ suggested that educational levels do not have significant associations with indices of population stress.

Conclusion and recommendation

The current study concluded that social support has important in reducing stress among patients with depression. In other words patient who has social support are more likely to experience stress.

Based on the results of this study the following recommendations are suggested:

- Development of social skills training program for patients with patients with depressive disorders.
- Develop training program for nurses about the importance of social support to patients and their families during difficult times.
- Training of psychiatric hospital staff to increase their understanding about the importance of their supportive role to provide appropriate nursing intervention for patients with psychiatric disorders

References

١. Ismail Z, Elbayoumi H and Fischer CE. Prevalence of depression in patients with mild cognitive impairment: a systematic review and meta-analysis. ٢٠١٧; ٧٤(١):٥٨-٦٧.
٢. Lim VZ, Ho RC and Tee SI. Anxiety and depression in patients with atopic dermatitis in a Southeast Asian tertiary dermatological centre. Ann Acad Med Singapore. ٢٠١٦; ٤٥:٤٥١-٥.
٣. Large M. Study on suicide risk assessment in mental illness underestimates inpatient suicide risk. BMJ ٢٠١٦; ٥٣٢:i٢٦٧.
٤. Tough H, Siegrist J and Fekete C. Social relationships, mental health and wellbeing in physical disability: a systematic review. BMC Public Health. ٢٠١٧; ١٧(١): ٤١٤.
٥. Kessler RC and Birnbaum H, Age differences in major depression: Results from the National Comorbidity Survey Replication (NCS-R) Psychological Medicine. ٢٠١٠; ٤٠:٢٢٥-٢٣٧.
٦. Medici C. Quality of life and clinical characteristics in a non-selected sample of patients with schizophrenia. International Journal of Social Psychiatry. ٢٠١٦; ٦٢: ١٢-٢٠.
٧. Pascoe MCand Thompson DR. Mindfulness mediates the physiological markers of stress: Systematic review and meta-analysis. Journal of Psychiatric Research. ٢٠١٧; ٩٥: ١٥٦-١٧٨.
٨. Wang X. Subjective wellbeing associated with size of social network and social support of elderly. Journal of Health Psychology. ٢٠١٦; ٢١(٦):١٠٣٧-٤٢.
٩. Campbell and Joan M. Ambient Stressors. Environment and Behavior. ٢٠١٦; ١٥ (٣): ٣٥٥-٨٠.
١٠. Bleys D and Soenens B. Gene-environment interactions between stress and ٥-HTTLPR

- in depression: a meta-analytic update. *Journal of Affect Disorders*. ٢٠١٨; ٢٢٦: ٣٣٩-٣٤٥.
١١. Chang, C.-W., Yuan, R., and Chen, J.-K. Social support and depression among Chinese adolescents: the mediating roles of self-esteem and self-efficacy. *Children Youth Services Review*. ٢٠١٨; ٨٨: ١٢٨-١٣٤.
 ١٢. Dulaney, E. S, Grant, K. E., Adam, E. K., and Chen, E. Taking on the stress-depression link: meaning as a resource in adolescence. *Journal of adolescence*. ٢٠١٨; ٦٥: ٣٩-٤٩.
 ١٣. Zimet GD, Dahlem NW, Zimet SG and Farley GK: The multidimensional scale of perceived social support. *Journal of Personal Assessment*. ١٩٨٨; ٥٢(١):٣٠-٤١.
 ١٤. Cohen, S., Kamarck, T and Mermelstein R. A global measure of perceived stress. *Journal of Health and Social Behavior*. ١٩٨٣; ٢٤(٤): ٣٨٥-٣٩٦.
 ١٥. Lopez J. P and Turecki G. Major depression and its treatment: microRNAs as peripheral biomarkers of diagnosis and treatment response. *Current Opinion in Psychiatry*. ٢٠١٨; ٣١(١): ٧.
 ١٦. Harfush S A and Gemeay M.: Perceived Social Support and Medication Compliance among Patients with Psychiatric Disorders .*International Journal of Novel Research in Healthcare and Nursing*. ٢٠١٧. Vol. ٤, Issue ٣, ١٥٧-١٦٩.
 ١٧. Sabra AI and Mohamed SA: Perceived Social Support and Life Satisfaction among Persons with Mental Disorders. ٢٠١٩; ٨(٤): ٠٧-١٦.
 ١٨. Munikanana T, Midinb M, Daudb TM, Sidib H and Baharuddin N. Association of social support and quality of life among people with schizophrenia receiving community psychiatric service: A cross sectional study. *Comprehensive Psychiatry* ٢٠١٧; ٧٥:٩٤-١٠٢.
 ١٩. ChronisterJ , Kwong-Liem C and Silver K. The Meaning of Social Support for Persons with Serious Mental Illness. *Rehabilitation Psychology*. ٢٠١٥; ٦٠(٣): ٢٣٢-٢٤٥.
 ٢٠. McGuire A. P, Gauthier J. M, Anderson L. M, Hollingsworth D. W, Tracy M, Galea S and Coffey S. F. Social support moderates effects of natural disaster exposure on depression and posttraumatic stress disorder symptoms: effects for displaced and non-displaced residents. *Journal of traumatic stress* .٢٠١٨; ٣١(٢): ٢٢٢-٢٣٣.
 ٢١. Ota M, Sato N, Hidese S, Maikusa N, Matsuda H and Kunugi H: Structural differences in hippocampal subfields among schizophrenia patients, major depressive disorder patients, and healthy

- subjects; Psychiatry Research: Neuroimaging. 2017; 209: 04-09.
22. Adams R, Winger J and Mosher C. A meta-analysis of the relationship between social constraints and distress in cancer patients. Journal of behavioral medicine. 2010; 38: 294.
23. Hou F, Cerulli C, Wittink MN, Caine ED and Qiu P.: Depression, Social Support and Associated Factors among Women Living in Rural China: a cross-sectional study. Journal of Biomedical Central women Health. 2018; 4(10):28, 29.
24. Naseri N and Taleghani F. Social support and depression in Iranian cancer patients: The role of demographic variables. Journal of Caring Sciences. 2018; 7: 143.
25. Duman M. The relationship between the social support level perceived by patients with gynecologic cancer and mental adjustment to cancer. International Journal gynecologic Obstetrical. 2016; 134: 208-11.
26. Costa-Requena G and Gil F. The influence of demographic and clinical variables on perceived social support in cancer patients. Revista de Psicopatologia y Psicologia Clinica 2016; 20: 20-7.
27. Zhang B, Yan X, Zhao F and Yuan F. The relationship between perceived stress and adolescent depression: The roles of social support and gender. Social Indicators Research. 2010; 123(2): 01-018.
28. Rankin J A, Paisley CA, Mulla M M and Tomeny T S. Unmet social support needs among college students: Relations between social support discrepancy and depressive and anxiety symptoms. Journal of counseling psychology. 2018; 60(4): 474.
29. Nikolich-Zugich, J and Knox, K. S. SARS-CoV-2 and COVID-19 in older adults: what we may expect regarding pathogenesis, immune responses, and outcomes. Geroscience. 2020; 42:00-014.
30. Shanahan, L., Steinhoff, A., Murray, A. L., and Hepp, U. Emotional distress in young adults during the COVID-19 pandemic: evidence of risk and resilience from a longitudinal cohort study. Psychol. Med. 2020; 1-10.
31. Mobasheri M, Yousefi Z, Moradi A, Mirzaeian R and Khaledifar B. Exploring the Effect of Social Support and Religious beliefs on the Life Satisfaction among the Elderly Living in Borujen. Life satisfaction. 2014; 11(9):409-464.
32. Wang JY, Lloyd-Evans B and Giacco D. Social isolation in mental health: a conceptual and methodological review. Social Psychiatry Psychiatric Epidemiology. 2017; 52(12):1401-11.

٣٣. Gonzalez-Saenz de Tejada M, Bilbao A, Baré M and Briones E,. Association between social support, functional status, and change in health-related quality of life and changes in anxiety and depression in colorectal cancer patients; Psycho-oncology. ٢٠١٧; ٢٦(٩): ١٢٦٣-١٢٦٩.
٣٤. Akbari M, Alavi M, Irajpour A and Maghsoudi J. Challenges of family caregivers of patients with mental disorders in Iran: A narrative review. Iranian journal of nursing and midwifery research. ٢٠١٨; ٢٣(٥): ٣٢٩.
٣٥. Recchi, E., Ferragina, E., Helmeid, E, Pauly, S., Safi M and Sauger, N. The “eye of the hurricane” paradox: an unexpected and unequal rise of well-being during the Covid-١٩ lock down in France. Res. Soc. Stratif. ٢٠٢٠; ٦٨: ١٠٠٥٠٨
٣٦. Rodríguez-Rey, R., Garrido-Hernansaiz, H., and Collado, S. Psychological impact of COVID-١٩ in Spain: Early data report. Psychological Trauma: Theory, Research, Practice, and Policy. ٢٠٢٠; ١٢(٥): ٥٥٠–٥٥٢.
٣٧. Mazza, C and Ricci, E. A nationwide survey of psychological distress among Italian people during the COVID-١٩ pandemic: Immediate psychological responses and associated factors. International Journal of Environmental Research and Public Health ٢٠٢٠; ١٧: ٣١٦٥.
٣٨. Vicario-Merino, A and Muñoz-Agustin, N. Analysis of the stress, anxiety and healthy habits in the Spanish COVID-١٩ confinement. Health Science. Journal. ٢٠٢٠; ١٤: ١–٦.
٣٩. Wang Y, Di Y, Ye J and Wei W. Study on the public psychological states and its related factors during the outbreak of coronavirus disease ٢٠١٩ (COVID-١٩) in some regions of China. Psychology, Health & Medicine. ٢٠٢٠; ٣٠: ١–١٠.
٤٠. Brooks, S. K., Webster, R. K., Smith, L. E and Woodland, L. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. ٢٠٢٠; ١٠, ١٠١٦/S٠١٤٠-٦٧٣٦(٢٠): ٣٠٤٦٠-٨.

Efficacy of Protocol of Hygienic Care by Chlorhexidine Gluconate on the Occurrence of Catheter Associated Urinary Tract Infection among Critical Ill Patients

¹Eslam Ebrahim Abd-El Hak, ²Zeainb Mohammed Sahban³, ⁴El Sayed Mohamed Tag El din, ⁵Seham Ahmed Abd ElHay

¹Demonstrator, Critical Care and emergency Nursing, Faculty of Nursing, Tanta University, Egypt.

²Lecturer of Critical Care and Emergency Nursing Tanta University, Egypt.

³Professor of Neuropsychiatry Diseases ,Faculty of Medicine, Tanta University, Egypt.

⁴Professor of Medical- Surgical Nursing ,Faculty of Nursing, Tanta University, Egypt.

Abstract

Catheter-associated urinary tract infections (CAUTIs) is the most common type of hospital acquired infection in Intensive Care Units. It is associated with significant morbidity, length of hospital stay and cost of hospitalization. Preventing CAUTI is essential and critical care nurses are the key to accomplishing this goal. **Aim:** - evaluate the efficacy of protocol of hygienic care by chlorhexidine gluconate on the occurrence of a catheter associated urinary tract infection among critically ill patients. **Design and setting:** - A quasi-experimental study was conducted at the Neurological Intensive Care Unit of both Tanta University Hospital and Neuro-psychiatry center at Tanta Main University Hospital. A convenience sampling of ٦٠ adult patients with indwelling urinary catheters were selected and divided into two equal groups ٣٠ patients in each group. **Group ١:-** (Control group), they received routine nursing care by hospital nursing staff. **Group ٢:-** (Study group), they received application of protocol of hygienic care by chlorhexidine gluconate ٢%. Three tools were used for data collection. **Tool (I)** Assessment tool which included Patient's socio-demographic characteristics. **Tool (II): Catheter Associated Urinary Tract Infection Assessment Profile (CAP):-** **Tool (III): Infection Assessment Sheet: -** **Results:** - The main results revealed that the incidence rate of CAUTI among control group subjects was ٩٣,٣٣% while among study group subjects was ٤٠,٠٠%. **Conclusions and recommendations:** - Application of protocol of daily Hygienic Care by Chlorhexidine Gluconate has a significance effectiveness on reducing CAUTI among critically ill patients. It was recommended that all critically ill patients with indwelling urinary catheter in ICU should receive daily Hygienic Care by Chlorhexidine Gluconate as routine of care.

Key words: Catheter-associated urinary tract infections, chlorhexidine gluconate ٢%, daily bathing

Introduction

Health care-associated infections (HAIs) are the type of infection that are acquired from hospitals after the second day of admission. It is estimated that up to ٨.٠% of all hospital deaths are directly or indirectly related to HAIs ^(١). Health care-associated infections acquired in Intensive Care Units (ICUs). This is of pronounced significance among critically ill patients related to many factors such as prolonged use of multiple invasive equipment^(٢) CAUTI represent the third-leading cause of infections in the Intensive Care Units worldwide after pneumonia and abdominal infections^(٣).

Catheter acquired urinary tract infection is one of the most common health care acquired infections among critically ill patients in ICU. Approximately ١٢%-١٦% of adult hospital inpatients will have an indwelling urinary catheter (IUC) during their hospitalization, and each day the indwelling urinary catheter remains, a patient has a ٣%-٧% increased risk of acquiring (CAUTI) ^(٤). In Egypt, surveillance was done in Intensive Care Units at Cairo University at April ٢٠٢٠. Its results revealed that total of ٢٠٢٢ patients were hospitalized in ICUs and acquired length of hospital stay more than ١٥ days. ^(٥)

Catheter-associated urinary tract infection is defined as a urinary tract infection that occurs among patients with an indwelling urinary catheter, where was in place for >٧ days, at least one of the following signs or symptoms: fever ($>38.0^{\circ}\text{C}$, suprapubic tenderness, costovertebral angle pain or tenderness, urinary urgency, urinary frequency, dysuria, Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 1.0 \text{ CFU/ml}$ ^(٦)

Several strategies have been used by healthcare specialists to deal with and prevent the risk of CA-UTIs among critically ill patients. These methods include hand hygiene practices, methods of handling indwelling catheter, urine collecting system appropriately, securing catheter properly, maintaining unobstructed urine flow and closed sterile drainage system, However, the application of antiseptic chlorhexidine gluconate ٢% bathing for the critically ill patients is the most proper method for controlling the source of CAUTIs infection. ^(٧)

Daily Chlorhexidine gluconate ٢% bathing during hygienic care in the ICU can prevent catheter associated urinary tract infection and become standard of care in most ICUs

and are incorporated into many experts guidelines^(٨) Chlorhexidine has a broad-spectrum activity against gram-positive and gram-negative bacteria, yeasts, and some lipid enveloped viruses. Potent sporicidal activity can be induced in chlorhexidine under altered physical and chemical conditions (eg, elevated temperature, altered pH, and addition of ethanol). However, chlorhexidine does not have activity against bacterial spores under the conditions present on skin. Due to its broad-spectrum antimicrobial activity and excellent safety profile, chlorhexidine is used in a wide variety of disinfectant, antiseptic, and preservative applications^(٩)

Critical care nurses are in the best positioned for CAUTI prevention among critically ill, by selecting of the optimal catheters and drainage systems, using strict aseptic technique during insertion of the suitable catheter, securing catheter to prevent movement, performing daily perineal care by using chlorhexidine gluconate ٢%, maintaining a closed drainage system, obtain urine specimen for culture at the first sign of infection and perform daily chlorhexidine gluconate ٢%, bathing. Also, reducing the catheter days by daily evaluation of the need for continuing an indwelling catheter and removal of the

catheter whenever possible and use of alternative method of bladder drainage (e.g. septic intermittent catheterization or use of external urine collection devices).^(١٠)

The use of daily CHG bathing in intensive care patients has been advocated to reduce many of the infections in critically ill patients. However, the effectiveness of CHG bathing to reduce ICU infections has varied considerably among published trials, making the effectiveness of CHG bathing in ICU patients uncertain. This variability has been suggested to be associated with the underlying risk of infection among The ICU patients included in the various trials, with the greatest benefit observed among patients with the highest prevalence of infection at baseline. Therefore, there's a great effectiveness of CHG bathing among adult intensive care patients in reducing various infections in the ICU bloodstream infections (BSI); central line-associated bloodstream infections (CLABSI), (CAUTI) and ventilator-associated pneumonia (VAP).^(١١)

Key guidelines for prevention of catheter-associated urinary tract infection include placement of indwelling urinary catheters for appropriate indications, using alternatives to indwelling catheterization and using aseptic technique during insertion, One element of correct insertion practices is cleaning of the

urethral meatus prior to catheterization by using chlorhexidine gluconate ٢% and early removal of indwelling catheters.^(١٧) Catheter associated urinary tract infection prevention guidelines can reduce catheter associated urinary tract infection rates in ICU. Therefore, the present study is an attempt to increase awareness about the effect of the use of daily CHG bathing among critically ill patient have major effectiveness on reduction of catheter associated urinary tract infection.

Significance of the study: CAUTI is the most common type of hospital acquired infection among critically ill patients. So that there were different methods for prevention of incidence of CAUTI before, during and after urinary catheter insertion. This carried out through maintenance aseptic technique, perineal care and performing daily bathing ongoing catheter care by chlorhexidine Gluconate ٢ %. It was implemented on all critically ill patients of neurological ICU at Tanta university hospitals. The use of chlorhexidine for routine urinary catheter care and daily bathing for patients with urinary catheters may significantly decrease catheter-associated urinary tract infections.

Aim of the study

Evaluate the efficacy of protocol of hygienic care by chlorhexidine gluconate on

the occurrence of catheter associated urinary tract infection among critical ill patients.

Research Hypothesis

The following research hypothesis was formulated in an attempt to achieve the aim of the study: Critically ill Patients in the Intensive Care Unit expected to have minimal catheter associated urinary tract infection post implementation of protocol of hygienic care by chlorhexidine gluconate.

Subjects and methods

A quasi- experimental research design was utilized to conduct the study.

Setting

The study was conducted at the Neurological Intensive Care Unit of both Tanta University Hospital and Neuro-psychiatry Center at Tanta Main University Hospital.

Subjects

A convenience sampling of (٦٠) critically ill patients in the above previously mentioned settings was included. The sample size was calculated based on Epidemiological Information Program, based on the total patients per year according to review of Tanta Main University Hospital statistical Records. They were divided into two equal groups; each group were consisted of (٣٠) patients as following:

Group (١): Study group, it was consisted of (٣٠) patients, who received protocol care according to hygienic care by chlorohexidine gluconate ٢% that was implemented by the researcher.

Group (٢): Control group, it was consisted of (٣٠) patients and **there** are received their routine care in the Intensive Care Units by nursing staff. Such as daily bathing with water and soap.

The following criteria were used for selecting sample: -

Inclusion Criteria

- Newly admitted patients.
- Patients who fixed a urinary catheter during their hospital stay.

Exclusion Criteria:

- Patients with a known allergy or hypersensitivity to CHG.
- Patients with chronic, severe and generalized skin abnormalities.
- Patients with a previous or current urinary tract infection.
- Patients with positive urine culture at the onset of catheterization.
- patients with diabetes mellitus, cancer and recent surgery.

Tools of data collection

Three tools were used to evaluate the efficacy of protocol of hygienic care by chlorhexidine gluconate on the occurrence of

a catheter associated urinary tract infection among critically ill patients, which includes the following:

Tool (I): Structural Clinical Assessment Tool

It was comprised of two parts:-

Part (١): Socio-demographic characteristics of patients: which included; patient' code, age, sex, marital status, occupation, level of educational and Place of residency.

Part (B): Patients' clinical data: - It was developed by the researcher based on literature review ^(١٢) ,to evaluate patients' clinical data regarding; current diagnosis, weight, height, date of admission, previous admission to ICU, chief complaint and present history, past medical and surgical history, allergic history, duration of disease, types of treatment, reasons for catheter insertion, catheter size, medications that had been prescribed and laboratory investigation.

Tool (II): Catheter Associated Urinary Tract Infection Assessment Profile (CAP)

Catheter associated urinary tract infection Assessment Profile was developed by **Inouye et al.,(١٩٩٠)^(١٤-١٦)** to measure the presence or absence of the following clinical symptoms of CUTI through physical examination ; fever, suprapubic tenderness,

flank tenderness, and delirium at pre, one week and two week post implementation of protocol of hygienic care by chlorhexidine gluconate. The catheter assessment profile tool contains definitions of each clinical sign and symptom as well as diagrams, to aid in their consistent assessment. **Scoring system:** It was scored as the following; (•) indicate absence of clinical symptoms and (١) indicate presence of clinical symptom.

Tool (III): Infection Assessment Sheet

It comprised of two parts:

Part (I): Catheter Urinary Tract Infection Assessment Sheet

Catheter urinary tract infection assessment sheet was developed by the researcher based on literature review^(١٧-١٩). It was used for indicating the systemic and local signs of infection at pre, one week and two week post implementation of protocol of hygienic care by chlorhexidine gluconate as the following;

-Systemic signs of infection which included; fever, chills, inflammation, swelling, allergy, urticaria, pain, discomfort, acute change in mental status and increase WBCs in the blood.

-Local signs of infection which included; turbid urine, dysuria, hematuria, bad odour, purulent discharge from catheter site, nocturia, redness near the catheter site, pain

near the catheter site and an increase of WBCs in urine. **Scoring system:** it was scored as the following; (•) indicate absence of symptoms and (١) indicate presence of symptom.

Part (II): Laboratory Investigations; the researcher utilize specific laboratory investigations to assess presence of urinary catheter infection as, urine analysis to detect incidence of bacteria, white blood cells, R.B.Cs, nitrites, proteinuria, glycosuria, ketonuria, and renal calculi in urine sample, urine culture for isolation of different organisms and blood culture for bacteremia.

Ethical and legal consideration

- Permission to conduct the study was obtained from the directors of the both Neurological Intensive Care Unit of both Tanta University Hospital and Neuro-psychiatry center at Tanta Main University Hospital.

An informed consent was taken from every conscious patient or his relatives after explanation the aim of the study.

-Confidentiality and privacy were taken into consideration a regarding data collection .A code number was used instead of names.

Methods of data collection

-All tools of the study were developed by the researcher after reviewing relevant

literature^(١٩-٢٠) to collect data except **Catheter associated urinary tract infection Assessment Profile** that was developed by **Inouye et al.**,^{(١٩٩٠).} ^(١٤-١٦)

- The developed tools were tested for content validity and clarity of questionnaire by nine experts in the Medical Surgical Nursing Critical Care Nursing and Neurological field professors and accordingly needed modifications were done. It was calculated and found to be = ٩٧٪

-All tools of the study were tested for reliability by using alpha Cronbach's test and found to be ٠,٨٩٦, ٠,٨٦٨, and ٠,٨٣١ respectively for the tool I, II, III which represent highly reliable tools.

-pilot study was conducted before the actual study on (١٠٪) of the patients, to test the clarity, feasibility; relevance and applicability of the different items of the tools to determine any obstacles that may encountered during the period of data collection , accordingly needed modifications were done before the main study . The **pilot study** was excluded from the original study subject.

-Data were collected over a period of ٨ months, started from March ٢٠٢٠ to october ٢٠٢٠.

-The present study was conducted through four phases (assessment, planning,

implementation and evaluation phase) and it was continued for each patient individually till the end of intervention of hygienic care period.

١. Assessment phase

Assessment of the baseline data for critically ill patients was carried immediately once within admission to the ICU and for ١٥ days of protocol of hygienic care by chlorohixidine gluconate ٢٪.by using tool (I) part I and part II, Tool II and Tool III used by the researcher for all patients in the study and control groups to assess the patients who meet the inclusion criteria and will be included in the study. The assessment phase includes the following: Assessment sociodemographic data and clinical data, Assessment of presence of Catheter Associated Urinary Tract Infection by using Tool (II) Catheter Associated Urinary Tract Infection Assessment Profile (CAP) and Assessment of signs and symptoms of CAUTI by using Tool (III) Catheter Urinary Tract Infection Assessment Sheet:

٢. Planning phase

The protocol of hygienic care by chlorohexidine gluconate ٢٪ was planned based on the study subjects' needs and literature review.

- The general objective of the care was to reduce the occurrence of catheter associated

urinary tract infection among critically ill patient.

- The specific objectives of the study were decrease signs and symptoms of catheter associated infection as fever, flank pain, suprapubic tenderness, interpret the required care to be provided in case of appearance of any complications.

-Preparing the content of the protocol of hygienic care; the content was prepared by the researcher according to literature review (٢٠٢٢) to meet the above mentioned specific objectives. An illustrative structured colored booklet was prepared.

-The hygienic care was carried out in (٢) basic phases individually for every patient as following: Phase ١: was carried out at the beginning of care to insert catheter and during any time will be determined to replace urinary catheter. Phase ٢: was carried out every day through performing daily use of chlorhexidine gluconate ٢% for the patients. The time of phases was detected according to the condition of the patients.

Implementation phase

- A protocol of hygienic care by daily chlorhexidine gluconate was carried out by the researcher for the study subjects throughout the following phases:-

-Phase (١):- Assessment of the patients and catheter insertion phase

It was implemented by the researcher, this phase take about ٣٠ minutes and include the following:

- Assess the perineum area of the patient on the admission to the hospital for detecting; skin irritation, skin breakdown, allergy, any abnormal signs and symptoms of infection as fever, inflammation, and swelling, leakage of urine, pain, bad odor and redness.

- Choice of catheter size according to patients' weight.

-Application of infection control measures by using aseptic technique during insertion of catheter.

-Clean of the perineum area of the patients before catheter insertion by chlorhexidine gluconate ٢% then during insertion and maintenance to prevent catheter associated urinary tract infection.

-Insert urinary catheter for the patients according to specific procedure.

-Aspirate ٣ ml of urine from the sampling port of the catheter.

-Take urine culture at the time of catheterization to be sure that patients are free from urinary catheter infection.

-Phase (٢); Application of Daily Chlorhexidine Gluconate ٢% for ١٤ days:

it included the following: - Reassess the perineum area of patient daily.

- Application of infection control measures by using aseptic technique.

- If patient' skin is extremely soiled, give a bath with soap and water first, Remedy skin cleanser by using a clean cloth for each skin area. Skin contamination with blood, secretions or faeces occurring will be removed using CHG ٢% solution.

- Hygienic care with daily chlorhexidine gluconate ٢% was performed every morning shift at a detected time for ١٤ days for every patient. CHG ٢% was prepared with diluted solution with equal amounts of warm tap water in clean basine with wash cloth.

- Hygienic care was carried out as the following; Assess and clean of perineum area, thigh, abdomen by CHG ٢%, clean around/ below the catheter, clean sterile closed system, empty of the drainage bag and clean it, catheter change if needed, check catheter patency, ensure position of drainage tube & bag and frequent observation of urine character (color, odor and consistency). After completing the procedure, the skin was not rinsed, no liquids, moisturising lotion or other care cosmetics was not applied.

- Daily review of the need to maintain the catheter, removal of it as soon as possible.

- **Control group** were received the routine nursing care provided to the patients by nurses in the Neurological Intensive Care Unit of Tanta Main University Hospital which includes; clean perineum area with soap and water, clean area with betadine solution.

٤. Evaluation phase

- Every patient in both groups (study and control) was assessed as the following:-

-**Tool I:** before implementation of protocol of hygienic care by chlorhexidine gluconate to assess baseline data for patients. - **Tool II:** was used pre, one week and two week post implementation of protocol of hygienic care by chlorhexidine gluconate.

Methods of data analysis

The collected data were organized, tabulated and statistically analyzed using SPSS software statistical computer package version ٢٦. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison was done using Chi-square test (χ^2). For comparison between means of variables for two groups, independent samples T-test was used. For comparison between means for variables pre and post intervention in a group, paired samples T-test was used. For comparison between means for variables during three periods of intervention in a

group, or for more than two variables, the F-value of analysis of variance (ANOVA) was calculated. Correlation between variables was evaluated using Pearson and Spearman's correlation coefficient r . A significance was adopted at $P < 0.05$ for interpretation of results of tests of significance (*). Also, a highly significance was adopted at $P < 0.01$ for interpretation of results of tests of significance (**).⁽¹³⁾

Results

Table (1): Distribution of the studied patients according to their socio-demographic characteristics among the studied groups. The results revealed that more than one third of the patients in both control and study groups (43.33% and 30.33 %) respectively were between (40-50) years old, with a mean age of (41.03 ± 8.63) in the control group and 41.47 ± 8.73 in the study group. **In relation to sex**, more than half of the patients in the control and study groups were male (63.33% and 53.33 % respectively), **Concerning marital status**, more than one third of the patients in the control and study groups 40.00% and 36.67% respectively were married. **Regarding educational level**, Nearly one quarter of studied patients in the control and study group had secondary education. **As regard to occupation**, it was

observed that less than half of the patients in control and study groups were (30.00% and 40.00%) respectively were not working.

Table (2): Show distribution of the studied patients according to their clinical data among the studied groups concerning their Current diagnosis. Our results showed that about one third of patient in control and study groups (33.33 % and 30.00%) respectively had hemorrhagic stroke. **Concerning BMI**, more than one third of the patients in both control and study groups (36.67% and 30 % respectively) were overweight. The mean duration of previous admission was 4.60 ± 1.17 and 4.07 ± 1.06 days in control and study groups respectively with no statistical significant difference between the two groups.

Table (3) illustrates distribution of the studied patients in the control and study groups according to urinary catheter assessment data. The results revealed that most of the patients in both control and study groups (70.00% and 93.33%) respectively catheterized due to limited mobility, followed by (30.00% of both groups catheterized for measuring urinary output. Concerning size of the catheter, most of the patients in the control and study

groups (46,67% and 43,33%) respectively were catheterized with 16 Fr catheter size.

Table (4) shows distribution of the studied patients according to their total level of catheter associated urinary tract infection assessment profile throughout periods of study. The results revealed that (50 %) of the patients in the control group had severe symptoms **after 2 weeks** as compared to (13,33%) of the patients in study group **after 2 weeks** of protocol. With mean (3,03±0,90) and (1,17±1,41) in control and study group respectively after 2 weeks.

Table (5): Distribution of the studied patients according to total level catheter associated urinary tract infection about local UTI manifestations throughout periods of study. The results revealed that (86,67%) of the patients in control group had severe symptoms **after 2 weeks** as compared to (6,67%) of the patients in study group **after 2 weeks** of protocol of care, with the mean (0,30±0,70) and (1,63±1,08) in control and study group respectively after 2 weeks of protocol of care. **Table (6) Distribution of the studied patients according to their total level of catheter associated urinary tract infection about systemic manifestations throughout periods of study.** The results revealed that (63,33%) of the patients in control group

had **after 2 weeks** as compared to (10,0%) of the patients in study group had severe symptoms **after 2 weeks** of protocol of care. With the mean of (0,83±0,98) and (1,93±2,01) in control and study group respectively after 2 weeks of protocol of care.

Table (7) presents Mean scores of blood chemistry items among the studied groups throughout periods of study. The results revealed that the mean of serum leukocytes count was (14,40±2,39) and (10,82±1,86) in the control and study group respectively **after 2 weeks** of protocol of care. The mean CRP level was (77,07±6,41) and (37,33±2,64) in control and study group respectively **after 2 weeks** of protocol of care.

Table (8) Show distribution of the studied patients according to urine culture throughout periods of study. **Regarding colony count**, it was found that the majority (80,00%) of patients in the control group had colony count (>100000) as compared to (20,00%) of the patients in study group had colony count (>100000) after 2 weeks of protocol of care. **In relation to types of microorganisms**, this table showed at the end of second week that, E-coli was the commonest pathogen in control

group (30,00%) followed by Klebsiella (16,67%), Staphylococci (16,67%), Enterobacter (10,00%) and Pseudomonas (6,67%). On the other hand, Staphylococci

Table (9) Correlation between catheters associated urinary tract infection assessment profile CAP, local UTI manifestations and systemic manifestations levels of the studied patients among the studied groups throughout periods of study. The table shows that CAP level had statistically significant positive correlation with UTI manifestations ($r=0,379$, $p=0,039$) pre care in control group while in the study group, CAP level had statistically significant correlation with UTI manifestation at the end of first week ($r=0,042$, $p=0,002$) and at the end of second week ($r=0,444$, $p=0,014$).

Catheters associated urinary tract infection assessment profile level had statistically significant positive correlation with systemic manifestation at the end of first week ($r=0,403$, $p=0,012$) and at the

was the commonest pathogen in study group (13,33%) followed by E-coli (3,33%), also Klebsiella (3,33%) and lastly Enterobacter (0,00%).

end of second week ($r=0,082$, $p=0,001$) in the control group.

Table (10) Correlation between catheter associated urinary tract infection assessment profile and sociodemographic characteristics of the studied patients among the studied groups throughout periods of study. There was no significant correlation between CAP and age in control and study group. In relation to gender there was a positive significant correlation between CAP and gender (femal gender) ($r=0,438$ $p=0,016$) in pre care, while there was no significant correlation at the end of two weeks. On the other hand no significant correlation was observed regarding level of education, residence, body mass index and prognosis with CAP.

Table (١): Distribution of the studied patients according to their socio-demographic characteristics.

Characteristics	The studied patients (n=٦٠)				
	Control group (n=٣٠)		Study group (n=٣٠)		χ^2 P
	N	%	N	%	
Age (in years)					
<٢٠	١	٣,٣٣	٠	٠,٠٠	٢,٤٧٦ ٠,٦٤٩
(٢٠- <٣٠)	٣	١٠,٠٠	٤	١٣,٣٣	
(٣٠- <٤٠)	٧	٢٣,٣٣	١٠	٣٣,٣٣	
(٤٠- <٥٠)	١٣	٤٣,٣٣	٩	٣٠,٠٠	
≥٥٠	٦	٢٠,٠٠	٧	٢٣,٣٣	
Range	(١٩-٥٤)		(٢٢-٥٣)		t=٠,٠٣٠
Mean ± SD	٤١,٥٣±٨,٦٣		٤١,٤٧±٨,٧٣		P=٠,٩٧٦
Gender					
Male	١٩	٦٣,٣٣	١٦	٥٣,٣٣	FE ٠,٦٠١
Female	١١	٣٦,٦٧	١٤	٤٦,٦٧	
Marital status					
Married	١٢	٤٠,٠٠	١١	٣٦,٦٧	٠,٤٥٤ ٠,٩٢٩
Single	٦	٢٠,٠٠	٦	٢٠,٠٠	
Divorced	٥	١٦,٦٧	٧	٢٣,٣٣	
Widow	٧	٢٣,٣٣	٦	٢٠,٠٠	
Educational level/					
Illiterate	٧	٢٣,٣٣	٥	١٦,٦٧	٠,٥٠١ ٠,٩٧٣
Read and write	٦	٢٠,٠٠	٦	٢٠,٠٠	
Primary education	٥	١٦,٦٧	٦	٢٠,٠٠	
Secondary education	٦	٢٠,٠٠	٧	٢٣,٣٣	
University educated	٦	٢٠,٠٠	٦	٢٠,٠٠	
Occupation					
Not work	٩	٣٠,٠٠	١٢	٤٠,٠٠	١,٢٧٥ ٠,٧٣٥
Employee	٨	٢٦,٦٧	٥	١٦,٦٧	
Manual work	٧	٢٣,٣٣	٦	٢٠,٠٠	
House wife	٦	٢٠,٠٠	٧	٢٣,٣٣	
Residence					
Rural	١٥	٥٠,٠٠	١٦	٥٣,٣٣	FE ١,٠٠
Urban	١٥	٥٠,٠٠	١٤	٤٦,٦٧	

* Significant at level $P < ٠,٠٥$.

Table (٢): Percent distribution of the studied patients(control &study group) according to their clinical data.

Clinical data	The studied patients (n=٦٠)				χ^2 P
	Control group (n=٣٠)		Study group (n=٣٠)		
	N	%	N	%	
Current diagnosis					
Brain stem infraction	٢	٦,٦٧	٤	١٣,٣٣	٠,٨٦٢ ٠,٩٧٣
Gullian barre syndrome	٤	١٣,٣٣	٣	١٠,٠٠	
Hemorrhage stroke	١٠	٣٣,٣٣	٩	٣٠,٠٠	
Ischemic stroke	٧	٢٣,٣٣	٧	٢٣,٣٣	
Mythenia gravies	٤	١٣,٣٣	٤	١٣,٣٣	
Seizures	٣	١٠,٠٠	٣	١٠,٠٠	
Weight (in kg)					
Range	(٤٩-١١٢)		(٥٥-١٢٠)		t=٠,٧٢٣
Mean ± SD	٧٨,١٣±٢,٩٢		٨١,٢٠±٣,٠٨		P=٠,٤٧٣
Height (in cm)					
Range	(١٤٨-١٨٦)		(١٦٠-١٨٦)		t=٠,٦٥٨
Mean ± SD	١٦٨,٣٣±٧,٦٣		١٦٩,٤٣±٥,٠٦		P=٠,٥١٣
Body mass index					
Under weight <١٨,٥	٢	٦,٦٧	٠	٠,٠٠	٢,٨٤٢ ٠,٧٢٤
Normal (١٨,٥-<٢٥)	٧	٢٣,٣٣	٩	٣٠,٠٠	
Overweight (٢٥-<٣٠)	١١	٣٦,٦٧	٩	٣٠,٠٠	
Obese Class I (٣٠-<٣٥)	٨	٢٦,٦٧	٩	٣٠,٠٠	
Obese Class II (٣٥-<٤٠)	١	٣,٣٣	١	٣,٣٣	
Obese Class III (≥٤٠)	١	٣,٣٣	٢	٦,٦٧	
Range	(١٦,٥١-٤٣,٧٥)		(١٩,٤٩-٤٢,٥٢)		t=٠,٤٢٠
Mean ± SD	٢٧,٦٦±٥,٨٣		٢٨,٢٩١٠±٥,٨١		P=٠,٦٧٦
Duration of previous admission (in days)					
Range	(٠-١٩)		(٠-١٧)		t=٠,٣٣٨
Mean ± SD	٤,٦٠±١,١٧		٤,٠٧±١,٠٦		P=٠,٧٣٧
Prognosis					
None	٢٠	٦٦,٦٧	١٧	٥٦,٦٧	١,٢٤٣ ٠,٥٣٧
Decline	٣	١٠,٠٠	٦	٢٠,٠٠	
Get better	٧	٢٣,٣٣	٧	٢٣,٣٣	

* Significant at level $P < ٠,٠٥$.

Table (٣): Percent distribution of the studied patients(control &study group) according to reason of catheterization and its size.

Catheterization	The studied patients (n=٦٠)				χ^2 P
	Control group (n=٣٠)		Study group (n=٣٠)		
	N	%	N	%	
# Reason of catheterization					
In critically ill patients to monitor urinary output	٢١	٧٠,٠٠	٢١	٧٠,٠٠	٥,٤٥٥ ٠,٠٤٢*
Bed ridden patient	٢١	٧٠,٠٠	٢٨	٩٣,٣٣	
Urine retention and obstruction of urine out flow	٦	٢٠,٠٠	٤	١٣,٣٣	
Post-operative drainage in surgical operation	٥	١٦,٦٧	٩	٣٠,٠٠	
Acute urinary incontinence	١٧	٥٦,٦٧	٢١	٧٠,٠٠	
Cather size					
١٤ Fr	٥	١٦,٦٧	٣	١٠,٠٠	١,٢٥٦ ٠,٧٤٠
١٦ Fr	١٤	٤٦,٦٧	١٣	٤٣,٣٣	
١٨ Fr	٩	٣٠,٠٠	١٠	٣٣,٣٣	
٢٠ Fr	٢	٦,٦٧	٤	١٣,٣٣	

* Significant at level $P < ٠,٠٥$.**Table (٤) Distribution of the studied patients according to their total level of catheter associated urinary tract infection assessment profile throughout periods of study.**

CAP items	The studied patients (n=٦٠)												χ^2 P		
	Control group (n=٣٠)						χ^2 P	Study group (n=٣٠)						χ^2 P	
	Pre care		After a week		After ٢ weeks			Pre care		After a week		After ٢ weeks			
	N	%	N	%	N	%		N	%	N	%	N			%
Total CAP level															
No symptoms (٠)	٢٧	٩٠,٠٠	١	٣,٣٣	١	٣,٣٣	٨٥,٥٩ ٠,٠٠٠*	٣٠	١٠٠,٠٠	١٤	٤٦,٦٧	١٤	٤٦,٦٧	٢٦,٣٩ ٠,٠٠٠*	
Mild (١-٢)	٣	١٠,٠٠	٨	٢٦,٦٧	٢	٦,٦٧		٠	٠,٠٠	١٢	٤٠,٠٠	١١	٣٦,٦٧		
Moderate (٣)	٠	٠,٠٠	١٢	٤٠,٠٠	٦	٢٠,٠٠		٠	٠,٠٠	٠	٠,٠٠	١	٣,٣٣		
Severe (٤)	٠	٠,٠٠	٩	٣٠,٠٠	٢١	٧٠,٠٠		٠	٠,٠٠	٤	١٣,٣٣	٤	١٣,٣٣		
Range	(٠-٢)		(٠-٤)		(٠-٤)		F=١٣٨,٤٧ P=٠,٠٠*	(٠-٠)		(٠-٤)		(٠-٤)		F=٩,٩٢ P=٠,٠٠*	
Mean ± SD	٠,١٧±٠,٥٣ ١		٢,٩٠±٠,٩٩٥		٣,٥٣±٠,٩٠٠			٠,٠٠±٠,٠٠		١,١٠±١,٣٧٣		١,١٧±١,٤١٦			

* Significant at level $P < ٠,٠٥$.

Table (A) Distribution of the studied patients according to urine culture throughout periods of study.

Urine culture	The studied patients (n=٦٠)													
	Control group (n=٣٠)						χ^2 P	Study group (n=٣٠)						χ^2 P
	Pre care		After a week		After ٢ weeks			Pre care		After a week		After ٢ weeks		
	N	%	N	%	N	%		N	%	N	%	N	%	
١.Colony count/ml														
None	٠	٠,٠٠	٢	٦,٦٧	٢	٦,٦٧		٣٠	١٠٠,٠٠	٤	١٣,٣٣	٦	٢٠,٠٠	
Sterile	٢٧	٩٠,٠٠	١	٣,٣٣	٠	٠,٠٠	٩٧,٢٢	٠	٠,٠٠	١٥	٥٠,٠٠	١٢	٤٠,٠٠	٦٥,٧٨
<١٠,٠٠٠	٣	١٠,٠٠	٤	١٣,٣٣	٠	٠,٠٠	٠,٠٠٠*	٠	٠,٠٠	٠	٠,٠٠	٢	٦,٦٧	٠,٠٠٠*
(١٠,٠٠٠-١٠٠,٠٠٠)	٠	٠,٠٠	١٣	٤٣,٣٣	٤	١٣,٣٣		٠	٠,٠٠	٩	٣٠,٠٠	٤	١٣,٣٣	
>١٠٠,٠٠٠	٠	٠,٠٠	١٠	٣٣,٣٣	٢٤	٨٠,٠٠		٠	٠,٠٠	٢	٦,٦٧	٦	٢٠,٠٠	
٢.postive Microorganisms														
None	٣٠	١٠٠,٠٠	٦	٢٠,٠٠	٤	١٣,٣٣		٣٠	١٠٠,٠٠	٢١	٧٠,٠٠	٢٠	٦٦,٦٧	
E.coli	٠	٠,٠٠	٨	٢٦,٦٧	٩	٣٠,٠٠		٠	٠,٠٠	١	٣,٣٣	١	٣,٣٣	
Klebsiella	٠	٠,٠٠	٥	١٦,٦٧	٥	١٦,٦٧		٠	٠,٠٠	١	٣,٣٣	١	٣,٣٣	
Pseudomonas	٠	٠,٠٠	٢	٦,٦٧	٢	٦,٦٧		٠	٠,٠٠	٠	٠,٠٠	٠	٠,٠٠	
Staphylococci	٠	٠,٠٠	٦	٢٠,٠٠	٥	١٦,٦٧	٥٧,٤٢	٠	٠,٠٠	٤	١٣,٣٣	٤	١٣,٣٣	١٣,٥٦
Enterobacter	٠	٠,٠٠	٢	٦,٦٧	٣	١٠,٠٠	٠,٠٠٠*	٠	٠,٠٠	٠	٠,٠٠	٠	٠,٠٠	٠,٤٨٣
Candida	٠	٠,٠٠	١	٣,٣٣	٢	٦,٦٧		٠	٠,٠٠	٠	٠,٠٠	٠	٠,٠٠	
E.coli & Klebsiella	٠	٠,٠٠	٠	٠,٠٠	٠	٠,٠٠		٠	٠,٠٠	١	٣,٣٣	١	٣,٣٣	
E.coli & Serratia	٠	٠,٠٠	٠	٠,٠٠	٠	٠,٠٠		٠	٠,٠٠	٠	٠,٠٠	١	٣,٣٣	
E.coli & Enterobacter	٠	٠,٠٠	٠	٠,٠٠	٠	٠,٠٠		٠	٠,٠٠	١	٣,٣٣	١	٣,٣٣	
Staphylococci & Serratia	٠	٠,٠٠	٠	٠,٠٠	٠	٠,٠٠		٠	٠,٠٠	١	٣,٣٣	١	٣,٣٣	

* Significant at level $P < ٠,٠٥$.

Table (9) Correlation between catheter associated urinary tract infection assessment profile (CAP), local UTI manifestations and systemic manifestations levels of the studied patients among the studied groups throughout periods of study.

	The studied patients (n=60)											
	CAP level											
	Control group (n=30)						Study group (n=30)					
	Pre care		After a week		After 2 weeks		Pre care		After a week		After 2 weeks	
	r	P	r	P	r	P	r	P	r	P	r	P
▪ Local UTI manifestations	0.379	0.039*	0.200	0.289	0.234	0.213	-	-	0.042	0.002*	0.444	0.014*
▪ systemic manifestations	-0.089	0.740	0.403	0.012*	0.082*	0.001*	-	-	0.300	0.004	0.302	0.006

r: Pearson 'correlation coefficient * Significant at level $P < 0.05$. * Highly significant at level $P < 0.01$.

Table (10) Correlation between catheter associated urinary tract infection assessment profile (CAP) and socio-demographic characteristics of the studied patients among the studied groups throughout periods of study.

Characteristics	The studied patients (n=60)											
	CAP level											
	Control group (n=30)						Study group (n=30)					
	Pre care		After a week		After 2 weeks		Pre care		After a week		After 2 weeks	
	r	P	r	P	R	P	r	P	r	P	r	P
Age	0.020	0.918	0.294	0.110	-0.149	0.433	-	-	0.272	0.140	0.246	0.191
Gender	0.438	0.016*	-	0.170	0.223	0.236	-	-	0.004	0.983	-0.074	0.798
Educational level	0.080	0.774	0.043	0.820	-0.030	0.804	-	-	-0.101	0.420	0.110	0.044
Residence	-0.104	0.087	0.000	1.000	-0.220	0.243	-	-	0.214	0.206	0.200	0.277
BMI	0.034	0.809	0.184	0.331	-0.230	0.212	-	-	-0.281	0.132	-0.134	0.479
Duration of previous admission (in days)	-0.119	0.032	0.390	0.031*	0.066	0.729	-	-	-0.183	0.334	-0.030	0.873
Prognosis	0.006	0.974	0.301	0.007	0.000	0.977	-	-	-0.140	0.460	-0.123	0.018

r: Pearson 'correlation coefficient * Significant at level $P < 0.05$. * Highly significant at level $P < 0.01$.

Discussion

Healthcare-associated infections (HAIs) are the type of infections where patients acquired during the course of receiving treatment for other conditions within a healthcare in Intensive Care setting and are not present or incubating at the time of admission. Critically ill patients in Intensive Care Units (ICUs) are at high risk for this type of infection as a result of underlying immunodeficiency, comorbidity, and placement of invasive devices and indwelling urinary catheters are one of the most frequently used invasive medical devices⁽³²⁾, Catheter-associated urinary tract infections (CAUTIs) are a major threat to public health since they are the most common hospital-acquired infections worldwide, accounting for 10% of them, and leading to Healthcare professionals have proposed several strategies for preventing HAIs including compliance with hand hygiene, aseptic technique, and contact isolation precautions for patients, but these strategies can be difficult to maintain⁽³³⁾

Chlorhexidine gluconate (CHG) is a widely used as antiseptic agent that has excellent

antimicrobial activity and rapidity of action. Furthermore, in contrast with other antiseptic agents, the residual antimicrobial activity of CHG is not affected by the presence of body fluids and blood⁽³⁴⁾. The main objective of this study was to evaluate the efficacy of protocol of hygienic care by chlorhexidine gluconate on the occurrence of a catheter associated urinary tract infection among critical ill patients.

Concerning socio-demographic characteristics of the studied patients.

The present study showed that more than one third of the patients in both control and study groups were in between (40-50) years old, It may be contributed to as age is a non-modifiable risk factor that impacts immunity and infection risk in the setting of exposure to a potential pathogen, Physical and functional incapacity, combined with the immunologic changes of aging, including those caused by immunosuppressive medications. This study as the same line of **Cassir et al. (2019)⁽¹¹⁾** who reported that the mean age of the studied patient were 58 in between (46-68) and 61 in between (48-73) years in the study and control group. Similarly **Noto et al. (2019)⁽⁹⁾** who reported that the age medians of study groups were

56,0 (42-68) and 56,0 (42-68) years in the study and control group. In the contrary, **Giles,et al.** (2019)⁽²⁴⁾ who concluded that all patients with age >60 years old who were admitted in the emergency department during one-month period developed CAUTI . **Regarding sex and marital status**, it was found that more than half of the patients in the control and study groups were male and more than one third were married. Our results agree with those of (**Galiczewski, et al.** (2017)⁽²⁵⁾ reported that more than half of the patients in control and study groups in the sample were male and married. **Regarding educational level** it was found that nearly one quarter of studied patient in control and study groups, were secondary educated. this finding with the same line with **Perotte, et al** (2019)⁽²⁶⁾ reported that about one quarter of studied patient in the control and study groups were secondary educated . **as regard to occupation**, it was observed that less than half of the patients in control and study groups were not working this finding was in the same line with **Mullin K et al** (2017)⁽²⁷⁾ who reported that one quarter of the patients had secondary education, and about less than one half were not working. **Concerning to Residence** it was found that there were half of the patient in the studied groups are lives in rural areas

and other half lives in urban area. This finding with the same line with **Vernon O, et al** (2016)⁽²⁸⁾.

Regarding medical diagnosis .The results demonstrated that, the majority of the patients in the control group and study group had hemorrhagic and had ischemic stroke. This finding was in the same line with **Richards et al.,** (2017)⁽²⁹⁾ , who reported that Patients in neurological ICUs were diagnosed as hemorrhagic and ischemic stroke. As regard to **body mass index**, our result pointed that more than one third of the patients in both control and study groups were overweight and obese class I. This finding was agreed with **Haifler, M, et.al** (2017)⁽³⁰⁾, who stated that mean of body index in studied group were $26,4 \pm (3,4)$ $27,1 \pm (3,13)$ (about one third of studied patients were obese) and have high risk of UTI. **Regarding to reason of catheterization**, the results revealed that most of the patients in both control and study groups catheterized because of limited mobility, followed by about two third of them catheterized for measuring urinary output. This result was in the same line of **Sampathkumar, et al** (2017)⁽³¹⁾ who performed study about reducing catheter-associated urinary tract infections in the ICU.

Regarding size of the catheter, most of the patients in the control and study groups were catheterized with 16 Fr catheter size. This may be due to availability of the equipment in ICU and patient characteristics (age, sex and size of urethral caliber). This finding was the same line of **Ferguson, et al.** (2018)⁽³¹⁾.

As regard catheter associated urinary tract infection assessment profile, the results revealed that about two third of patients in control group were have severe symptoms compared to the minority of patients in study group had severe symptoms. This result was in the same line of **Pietraszak, et al.** (2019)⁽³²⁾ **In relation to total local UTI manifestation** The result was found about two third of patient in the control group compared to less than one third of patient in the study group had **local UTI manifestation** . This finding was in the same line with **Dubbs et, al** (2019).⁽³³⁾

Regarding to Distribution of the studied patients according to systemic manifestations of catheter associated urinary tract infection. This result demonstrated that the majority of patient in control group had sever systematic manifestation compared to the minatory of patient in the study group. **This finding was in the same line with Rosenthal, et al.**

(2019)⁽³⁴⁾. On the other hand, CAUTI was asymptomatic in critically ill patient that reported by **Weiss, et al** (2019)⁽³⁵⁾

Concerning blood chemistry. The present results revealed that mean serum leukocytes count was $14,40 \pm 2,39$ and $10,82 \pm 1,86$ in control and study group after 2 weeks. The mean CRP level was $37,07 \pm 6,41$ and $37,33 \pm 2,64$ in the control and study group. This results was supported by another study of SartoriM et,al (2021)⁽³⁶⁾

In relation to bacterial count and causative microorganisms of CAUTI, the results of the present study revealed the most of the patient in the control group had positive colony count as compared to few of the patients in the study group were have negative colony count This finding was supported by **Meddings, et al** (2019)⁽³⁷⁾ **In relation to types of microorganisms**, it was showed that E-coli was the commonest pathogen in control group since these organisms are capable of colonizing the intestinal and vaginal tracts as well, these sites can serve as potential reservoirs for UTIs and CAUTIs ,followed by Klebsiella , Staphylococci , Enterobacter and Pseudomonas This finding was in the same line of **Sabir et al.**(2017)⁽³⁸⁾ **Concerning Correlation between catheter associated**

urinary tract infection assessment profile, local UTI manifestations and systemic manifestations levels the current study showed that there was positive correlation between CAP level and systemic manifestations after week and ٢ weeks in control group. This finding was in the same line with **Durant, et al (٢٠١٧)^(٣٩)** . As regard **Correlation between catheter associated urinary tract infection assessment profile and sociodemographic characteristics of the studied patients.** The current results showed that no significant correlation between CAP and sociodemographic characteristics of the studied patients except a significant positive correlation was found related duration of previous admission in control group. this finding with the same line of **Busl, et al. (٢٠٢١)^(٤٠)** who performed study about Catheter-Associated Urinary Tract Infection (CAUTI) in the Neuro-ICU reported that increase period of previous hospitalization ,lead to increased risk of exposure of CAUTI.

Conclusion

Based on the finding of the current study, it can be concluded that: Application of Protocol of Hygienic Care by Chlorhexidine Gluconate on Occurrence of Catheter Associated Urinary Tract Infection among

Critical Ill Patients shows a positive result in decreasing Catheter Associated Urinary Tract Infection, as there was a significant improvement in the total mean scores of laboratory studies immediately , after weak and after two weeks of protocol of Hygienic Care by Chlorhexidine Gluconate implementation among study group in Neurological Intensive Care Unit of both Tanta University Hospital and Neuro-psychiatry center at Tanta Main University Hospital setting in relation to the control group with routine of hospital care of hygienic care implementation.

Recommendations

- Provide clear instruction to patients and care giver on proper hygienic care, urinary catheter care and drainage system by using Chlorhexidine Gluconate.
- Protocol of Hygienic Care by Chlorhexidine Gluconate on Occurrence of Catheter Associated Urinary Tract Infection which included using of aseptic techniques for catheterization and catheter care should be carried out as a routine care for critically catheterized patients.
- Daily evaluation of the need for continuing an indwelling catheter and removal of the catheter whenever possible and use of alternative method of bladder drainage

-Development of in-service training program for all health team workers especially nursing staff in Intensive Care Units about care of indwelling catheterized patients and the preventive measures of catheter-associated urinary tract infections (CAUTIs)-Increase awareness of critical nurses about daily hygienic care by using Chlorhexidine Gluconate.

-Assessment of problems facing critical care nurse regarding hygienic and catheter care and their effect on nurses' performance and satisfaction. -keeping Chlorhexidine Gluconate material available for all patients and nurses.

References

١. Hassan R, El-Gilany A, El-Mashad N, Azim D. An overview of healthcare-associated infections in a tertiary care hospital in Egypt: Infection Prevention in Practice. Published by Elsevier Ltd on behalf of The Healthcare Infection Society. ٢٠٢٠;٢(٣):٢٧-٩ Available on <http://creativecommons.org/licenses/by-nc-nd/٤.٠/>.
٢. Yasser B, Abulhasan A, Abdulla A, Shetty A, Ramadan, Waleed Yousef and Eiman M, Mokaddas. Health Care Associated Infections in a Neurocritical Care Unit of a Developing Country Neurocrit Care ٢٠٢٠ ٣٢:٨٣٦-٨٤٦© ٢٠١٩ Springer Science Business Media, LLC, part of Springer Nature and Neurocritical Care Society.
٣. Divani A, Hevesi M, Pulivarthi S, Luo X, Souslian F, Suarez J, Bershad E. Predictors of nosocomial pneumonia in intracerebral hemorrhage patients: A multi-center observational study. Neurocritical Care. ٢٠١٥;٢٢(٢):٢٣٤-٤.
٤. Mullin K, Kovacs C, Fatica C, Einloth C, Neuner E, Guzman J, Fraser T. A multifaceted approach to reduction of catheter-associated urinary tract infections in the intensive care unit with an emphasis on “stewardship of culturing”. Infect Control HospEpidemiol. ٢٠١٧;٣٨(٢):١٨٦-٨.
٥. Dwedar R, El-Wakil, D, & Awad, A. Burden of Device-Associated Infections in an Adult Medical and Surgical Intensive Care Units of a Tertiary Care Hospital in Egypt, ٢٠٢٠.
٦. Sartori A, Padilla B, Blok, B, Castro-Díaz, D, Popolo G, Musco S, & Pannek J. Definitions of Urinary Tract Infection Used in Interventional Studies Involving Neurourological Patients—A Systematic Review. European Urology Focus. ٢٠٢١.
٧. Lowe C, Lloyd-Smith E, Sidhu B, Ritchie G, Sharma A, Jang W. Reduction

- in hospital-associated methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus* with daily chlorhexidine gluconate bathing for medical inpatients. *American journal of infection control*, ٢٠١٧. ٤٥(٣), ٢٥٥-٥.
٨. Musuuza S, Roberts T, Hundt A, Carayon P, Zimbric M, Schuetz V, Safdar N. Implementing daily chlorhexidine gluconate treatment for the prevention of healthcare-associated infections in non-intensive care settings: A multiple case analysis. *PloS one*. ٢٠٢٠;١٥ (٤): ١-٢٠.
 ٩. Noto M, Domenico H, Byrne D, Talbot T, Rice T, Bernard G,. Chlorhexidine bathing and health care-associated infections: A randomized clinical trial. *Jama*. ٢٠١٥; ٣١٣(٤): ٣٦٩-٧٨.
 ١٠. Saint S, Greene T, Krein L, Rogers A, Ratz D, Fowler E, Fakh G. A Program to Prevent Catheter-Associated Urinary Tract Infection in Acute Care. *New England Journal of Medicine*, ٣٧٤(٢٢), ٢١١١-٢١١٩. ٢٠١٦. doi:١٠.١٠٥٦/NEJMoa١٥٠٤٩٠٦
 ١١. Cassir N, Thomas G, Hrajech S. Chlorhexidine daily bathing: impact on health care-associated infections caused by gram negative bacteria. *American J of Infection Control*. ٢٠١٥; ٤٣(٢):٦٤٠-٢.
 ١٢. Rivera A, Ong-Lim L, Gonzales L. effectiveness of daily chlorhexidine bathing in reducing healthcare-associated infections in the pediatric intensive care unit of a tertiary government hospital. ٢٠١٨, ٣٩٩.
 ١٣. Simone B, Sartelli M, Ansaloni L, Catena, F. How to Prevent and Treat Catheter-Associated Urinary Tract Infections. *Infections in Surgery* ٢٠٢١; pp. ٧٣-٨٨. Springer, Cham.
 ١٤. Inouye S. van Dyck C. Alessi C. Balkin S, Siegal A. Horwitz R. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Ann Intern Med*. ١٩٩٠, ١٥; ١١٣(١٢):٩٤١-٨.
 ١٥. Hooton T, Bradley S, Cardenas D, Colgan R, Geerlings S, Rice J. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: International Clinical Practice Guidelines from the Infectious Diseases Society of America. , Infectious Diseases Society of America. *Clin Infect Dis*. ٢٠١٠; ١; ٥٠(٥):٦٢٥-٦٣.
 ١٦. Horan T. Andrus M. Dudeck M. CDC/NHSN surveillance definition of health care-associated infection and criteria for specific types of infections in

- the acute care setting. *Am. J. Infect Control.* 2008; 36(5):309-32.
17. Lynn P. Taylor's clinical nursing skills, 4th ed., Lippincott, New York. 2010; 674-91.
18. Bardossy A, Williams T, Jones K, Szpunar S, Zervos M, Alangaden G, Fakih M. Culturing practices and the care of the urinary catheter in reducing NHSN-defined catheter-associated urinary tract infections: the tale of two teaching hospitals. *Infection Control and Hospital Epidemiology.* 2018; 39(12), 1494-6.
19. Aljamali M, Al Najim M . Review in Hospital-Acquired Infection. *International Journal of Advances in Engineering Research*, 2020,20(3), 7-20.
20. Islam R, Uddin Ahmed S, Golam Kibria M, Al Faruq A, & Uddin M. Gross Anatomy of Urethra and Penis in Uncastrated and Castrated Buck of Black Bengal Goat. *International Journal of Morphology*, 2021; 39(1).
21. Sanford H, Harmon A, Kesani D, Gurram S, Gupta N, Mehralivand S, & Turkbey B. Quantitative Characterization of the Prostatic Urethra Using MRI: Implications for Lower Urinary Tract Symptoms in Patients with Benign Prostatic Hyperplasia. *Academic radiology*, 2021. 28(5), 664-70.
22. Furr J, & Gelman J. Functional anatomy of the male urethra for the reconstructive surgeon. In *Textbook of Male Genito-urethral Reconstruction* 2020; pp. 17-24, Springer, Cham
23. Gerstman B Burt. Basic biostatistics, Statistics for public health practice. Jones and Bartlet publisher, Inc, 6339 Ormindale Way, Mississauga, Ontario L0V 1J, Canada, 2008
24. Giles M, Graham L, Ball J, Watts W, King J, Bantawa K, & Parker V. Variations in indwelling urinary catheter use in four Australian acute care hospitals. *Journal of clinical nursing*, 2019; 28(23-24): 4072-81.
25. Galiczewski M, & Shurpin M. intervention with CHG to improve the catheter associated urinary tract infection rate in a medical intensive care unit: direct observation of catheter insertion procedure. *Intensive and Critical Care Nursing*, 2017; 40, 26-34.
26. Letica-Kriegel S, Salmasian H, Vawdrey K, Youngerman E, Green A, Furuy Y, & Perotte R. Identifying the risk factors for catheter-associated urinary tract infections: a large cross-sectional study

- p>of six hospitals.
- BMJ open*
- , 2019; 9(2), e022137
27. Vernon O, Hayden K, Trick E, Hayes A, Blom W, Weinstein A. Chlorhexidine gluconate to cleanse patients in a medical intensive care unit: the effectiveness of source control to reduce the bioburden of vancomycin-resistant enterococci reduce infection. *Archives of Internal Medicine* 2016; 166(3): 306-12.
28. Richards B, Sebastian B, Sullivan H, Reyes R, D'Agostino F, & Hagerty, T. Decreasing catheter-associated urinary tract infections in the neurological intensive care unit: one unit's success. *Critical care nurse*, 2017 37(3), 42-8.
29. Haifler M, Mor Y, Dotan Z, Ramon J, Zilberman E. Prophylactic antibiotic treatment for the prevention of catheter-associated urinary tract infections in ICU: did the AUA guidelines make a difference?. *Journal of robotic surgery*, 2017;11(3): 367-1.
30. Sampathkumar, P. Reducing catheter-associated urinary tract infections in the ICU. *Current opinion in critical care*, 2017; 23(5): 372-7
31. Ferguson, A. Implementing a CAUTI prevention program in an acute care hospital setting. with Chlorhexidine Gluconate bathing *Urologic Nursing*, 2018; 38(6): 273-202. <https://doi.org/10.7207/10.53-816X.2018.38.6.273>.
32. Pietraszak M ,Blodgett J, Gardner E, Blodgett P, Peterson V. A tool to assess the signs and symptoms of catheter-associated urinary tract infection in critically ill patient in ICU: development and reliability. *Clinical nursing research*, 2010; 24(4):341-56.
33. Dubbs B, & Sommerkamp K. Evaluation and management of urinary tract infection in the emergency department. *Emergency Medicine Clinics*, 2019;37(4): 77-23.
34. Dehghanrad F, Nobakht-e-Ghalati Z, Zand F, Gholamzadeh S, Rosenthal V.. Effect of instruction and implementation of a preventive urinary tract infection bundle on the incidence of catheter associated urinary tract infection in intensive care unit patients. *Electronic Journal of General Medicine*, 2019;16(2).
35. Weiss E ,Yakusheva O, Costa, K, Bobay K L, Parada P . Variability in catheter-associated asymptomatic bacteriuria rates among individual nurses in intensive care units: An observational cross-sectional study. *PloS one*, 2019;14(7), e 0218700.
36. Sartori M, Padilla B, Blok F, Castro-Díaz, M, Del Popolo, G. Definitions of

- Urinary Tract Infection Used in Interventional Studies Involving Neurourological Patients—A Systematic Review. *European Urology Focus*. ٢٠٢١; ٧(٢): ٣٢٥.
٣٧. Meddings J, Saint S, Fowler KE, Gaies E, Hickner A, Krein SL. The Ann Arbor criteria for appropriate urinary catheter use in hospitalized medical patients: results obtained by using the RAND/UCLA appropriateness method. *Ann Intern Med*. ٢٠١٥; ١٦٢ (٩ Suppl): S١–S٣٤
٣٨. Sabir N, Ikram A, Zaman G, Satti L, Gardezi A, Ahmed A. Bacterial biofilm-based catheter-associated urinary tract infections: Causative Causative pathogens and antibiotic resistance. *American journal of infection control*, ٢٠١٧; ٤٥(١٠): ١١٠١–٥.
٣٩. Durant J. Nurse-driven protocols and the prevention of catheter-associated urinary tract infections: a systematic review. *American journal of infection control*, ٢٠١٧; ٤٥(١٢): ١٣٣١–٤.
٤٠. Busl K, Perrin K, Vats A, Qureshi A, Hester J, Larson A. Catheter-Associated Urinary Tract Infection (CAUTI) in the NeuroICU: Identification of Risk Factors and Time-to-CAUTI Using a Case–Control Design. *Neurocritical care*, ٢٠٢١; ٣٤(١): ٢٧١–٨.

Effectiveness of adoption of positive coping strategies on women's knowledge and practices related to endometriosis

¹ *Sabah Lotfy Mohamed El Sayed*, ^٢ *Mohamed Lotfy Mohamed El Sayed*, ^٣ *Amany S. Badawy*,

¹ *Department of Obstetrics and Gynecology Nursing, Faculty of Nursing, Zagazig University, Egypt.*

^٢ *Department of Obstetrics and Gynecology, Faculty of Human Medicine, Zagazig University, Egypt.*

^٣ *Department of Obstetrics and Gynecology Nursing, Faculty of Nursing, Zagazig University, Egypt.*

Abstract

Background and Aim: Endometriosis affects ٥ to ١٥% of women in their reproductive years. It causes a wide range of social, psychological, and emotional issues. The study aimed to evaluate effectiveness of adoption of positive coping strategies on women's knowledge and practices related to endometriosis. **Subjects and Methods:** This study used quasi-experimental research design. The research was carried out in Egypt at the endoscopy section of Zagazig University Hospital and Al Ahrar Hospital. A purposive sample of ١٥٠ women with endometriosis was included four tools were used to collected the necessary data. (I) A systematic interviewing questionnaire (II) laparoscopic (III) the Numeric Pain Rating Scale, endometriosis rating by the American Society of Reproductive Medicine and (IV) women's knowledge and practice questioner. **Results:** The study findings revealed that adopting the identified coping strategies women's knowledge and practice with, pain related to endometriosis ($P < ٠,٠٠٠$). **Conclusion:** Adoption of Positive coping strategies had a significant effect on women's knowledge, practices related to endometriosis. **Recommendations:** This study emphasizes the critical significance of nurse education initiatives and programs in promoting awareness, knowledge, and behaviors and practices related to endometriosis among women.

Keywords: Endometriosis, Positive Coping Strategies, Women's Knowledge, Women's Practices.

Introduction

The presence of developing endometrial tissue outside of the uterine cavity is known as endometriosis.^(١) Endometriosis causes a multitude of symptoms in women, including dysmenorrhea, heavy periods, pelvic discomfort, dyspareunia, and infertility, all of which have a significant impact on their quality of life. However, some women show no signs or symptoms.^(٢) Endometriosis affects ٣,٧ percent of women aged ٢٤ to ٢٩ years in Australia, with some estimates of ٥٦,٠٠٠ women are affected.^(٣-٤) Between ١٩٩٨ and ٢٠١٣, the global prevalence of endometriosis grew by ٦,٤ percent.^(٥) These statistics are based on laparoscopic surgery, and some of them may not be representative of the overall population.^(٦-٧)

Endometriosis is commonly misdiagnosed by history and physical examination, however laparoscopic surgery is the gold standard of diagnosis.^(٨) Endometriosis does not have a perfect cure. Treatment options include pain treatments [such as nonsteroidal anti-inflammatory drugs], hormone replacement, preventative surgeries, fertility management, hysterectomy, and ovarian resection. Other possibilities include alternative treatments

(such as acupuncture for pain relief), lifestyle changes, and home remedies.^(٩)

Obtaining advice from families, healthcare workers, and the Website, implementing self-managing procedures and eliminating ineffective lifestyles, selecting activities and habits, and identifying self-management strategies appropriate to women's lives and stages of the disease are all described as coping strategies for women with endometriosis.^(١٠-١١)

The study significance

In Egypt, the prevalence of endometriosis is unknown, and the diagnosis can only be confirmed with laparoscopy. Endometriosis has numerous effects on a woman's daily life, social relationships, and sexual life. Nurses and other healthcare providers play an important role in implementing positive coping strategies related to endometriosis, an urgent need to enhance women's knowledge and skills by increasing their information and providing ongoing advice on the care of women diagnosed with endometriosis.^(١٢)

Aim of the study

The study aimed to evaluate effectiveness of adoption of positive coping strategies on women's knowledge and practices related to endometriosis.

Research hypothesis

Women knowledge and practices, pain related to endometriosis will improve as a result of adoption of positive coping strategies.

Subjects and Method

Subjects

To achieve the study's aim, a quasi-experimental study design was adopted.

Study Setting

The study was conducted at the Gynecological laparoscopy Unit at Zagazig University Hospital and Al-Ahrar Hospital, Zagazig. The department of Gynecology includes two internal units and one operating room. It works seven days a week and focuses on the cure and care of women with endometriosis and gynecology issues [internal unit]. The laparoscopy unit staff consists of ten senior gynecologists, five junior experts, and five nurses with a nursing diploma. In the gynecology department, there are no nurses responsible for health education.

Study Subjects

A purposive sampling of ١٥٠ women was selected based on the following criteria: all women diagnosed with endometriosis by laparoscopy during the data collection period and who were willing to participate

in the study, while women diagnosed with other gynecological or medical conditions or issues were excluded from the study.

Sample size

During the one-year study period [January ١, ٢٠١٩ to December ٣١, ٢٠١٩], ٦٣٦ women were admitted to the Gynecological Endoscopy Unit for laparoscopic surgery, ١٥٠ of whom were diagnosed with endometriosis, according to hospital records.

Methods

Official approval

The study was approved by the Dean of Zagazig University's Faculty of Nursing and then passed on to the administration of Zagazig University's hospitals.

Ethical Considerations

The study was approved by the Scientific Research Ethics Committee, Faculty of Nursing, Zagazig University, and Chairman of the Board of Administrators of Zagazig University Hospitals, pursuant to ethical code number (NUR٢٠١٩). The researchers, informed each participant at the start of the interview that they had the right to withdraw and would have no influence on the hospital services given. The researcher safeguarded all of the participants'

information, and pseudonyms were utilized to maintain their identity.

Tools for data collection

Data was collected using four tools.

Tool I: A structured interviewing sheet.

It was developed by the researcher based on relevant literature

Part (A): Sociodemographic characteristics of women diagnosed with endometriosis. This contained data such as age [year], educational level, residence, employment status, and income level.

Part (B): Menstrual and gynaecological history of women diagnosed with endometriosis. This covered the age of first menstruation [years], period days, menstrual cycle length [days], infertility duration [years], and pelvic surgical history such as laparoscopy or laparotomy.

Part (C): Endometriosis signs, symptoms and problems. It comprised questions related to painful periods [dysmenorrhea], pain during intercourse, menstrual cycle irregularity, vaginal bleeding between menstrual cycles, heavy menstruation, infertility, digestive and urinary problems [diarrhea, constipation, bloating, or nausea]. Assessment of endometriotic symptoms included the presence of inner scarring, adhesions, chocolate cysts on the ovaries,

obstruction of the intestines and ureters as well as recurrent absenteeism from work.

Tool II: Degrees, and categories/ classification types of endometriosis diagnosed by laparoscopic.

The degree of endometriosis was classified as minimal [first degree], mild [second degree], moderate [third degree], and severe [fourth degree] by the American Society for Reproductive Medicine [١٩٧٩].^[١٣]

Endometriosis was classified as unilateral or bilateral ovarian endometriosis, peritoneal endometriosis, endocervical endometriosis, ovarian and rectovaginal endometriosis, intestinal endometriosis, urogenital endometriosis, or extensive invasive peritoneal endometriosis.

Tool III: Women's knowledge and practice of endometriosis. It was developed by researchers based on relevant literatures and included two parts:

Part (A): Women's knowledge of endometriosis. It included the definition, etiology, manifestations, diagnosis, complications, and therapy of endometriosis.

Scoring system for knowledge:

- Correct and complete answer scored as (١).

- Incorrect / wrong answer score as (٠).

Total score for knowledge:

- Good level of knowledge : ٦٠-١٠٠ %
- Poor level of knowledge: less than ٦٠%

Part (B): Women's practice, habits and how they cope with endometriosis.

A healthy lifestyle included limiting dairy and processed foods, eating less red meat, and eating more fruits, vegetables, and whole grains. Regular exercises also support the body release endorphins and reduce estrogen level. Moreover, extra rest, especially during the menstrual period, and sleeping on one side with the knees pulled over the chest has an important role in relieving the discomfort associated with endometriosis symptoms.

Scoring system for practice:

- Always done scored as (١).
- Not done scored as (٠).

Total score of expertise:

- Correctly done: ٦٠-١٠٠ %
- Incorrectly /not done: < ٦٠%.

Tool IV: Visual Analogue Scale. It was adopted from **William and Hoggart (٢٠٠٥)**

A ١١-point digital rating scale was used to assessed the intensity of pain-related endometriosis such as dysmenorrhea, dyspareunia, and non-menstrual pelvic pain, and all patients were asked to rate the degree of their pain at the initial interview and follow-up visit.^(١٤-١٥) This pain was graded "from zero to ١٠, with zero indicating no pain and ten indicating severe pain, using the color scale scheme: Yellow (Grade ٠) means no pain, Green (Grade ١-٣) means mild pain, Blue (Grade ٤-٦) means moderate pain, and Red (Grade ٧-١٠) means severe pain.^(١٦)

Validity

Four specialists in the Fields of Obstetrics and Gynecology from the Faculty of Medicine and Nursing examined the tools for clarity and relevance of content. The tools had not been altered in any way.

Reliability

The Cronbach alpha-coefficient test was used to test reliability, and the internal consistency of visual analogues scale was found to be $r = ٠,٨٣$.

Pilot study

A pilot study was done on a sample of ١٠% (١٥ women) of the study sample prior to data collection to assess the clarity and applicability of the tools, the feasibility of

the study, and the period needed to collect data. The main study sample included the pilot sample.

Data collection

Interviews with women were done by the researchers. Each interview lasted ٣٠ to ٤٠ minutes and twice a week [on Saturday and Wednesday] between ٩ a.m. and ٣ p.m. from January to December ٢٠١٩.

Phases of the study. The study interference was carried out through three phases as follows:

١. Assessment phase

Women who met the inclusion criteria and were accepted to join in the study were interviewed two times individually. At the start of the interview, the researcher greeted the endometriosis-affected women, described the purpose of the study, and obtained their verbal consent. In the pre-and postoperative phase, the researchers filled out pre-prepared questionnaires before and after the intervention.

٢. Planning phase

Different methods of teaching were developed and used. A guidance brochure on endometriosis was designed in easy Arabic to suit the diverse educational levels of women based on the findings of the assessment phase, related literature, and

educational sessions addressing endometriosis. This was presented through video and PowerPoint presentations on a laptop, as well as discussion sessions and an informative booklet. The lecture covered the definition, etiology, pathophysiology, and stages of endometriosis, as well as endometriosis symptoms and effects, diagnosis, and pharmacological and surgical treatment options. Further, the coping strategies were discussed.

٣. Implementation phase

Positive coping strategies were educated for women diagnosed with endometriosis. The content was presented by researchers jointly with the educational tools (brochure, videos, PowerPoint presentation and laptop) and using different educational methods as lectures and discussion.

Problem-solving approaches session. This included knowledge regarding restricted physical exercise, increased knowledge about endometriosis (heard about endometriosis before it was diagnosed, foods or exercise schedules), work or home activities, and social relationships during menstruation, as well as self-managing approaches (relaxation or exercises)^(١٧)

Strategies that concentrated on emotions

session. This included accepting the illness by knowing how to deal with endometriosis, adopting proper behavior, talking with self, encouraging relaxation, and spiritualists (praying and beseeching God) are important methods of dealing with endometriosis symptoms. ^(١٧)

Coping strategies for a healthy lifestyle

session. It included information to help relieve pelvic muscle spasms, take a warm bath or place a heating pad or hot water bottle in the lower abdomen, and massage the pelvic area before menstrual period to reduce menstrual discomfort associated with endometriosis. ^(١٧)

٤. Evaluation phase

One month following the intervention, assessment was carried out using the same pre designed tools of data collection [I, II, III, and IV]. A month was selected in order to most women were expected to be in the same phase of their menstrual cycle, which can be associated with endometriosis symptoms.

Statistical analysis:

The IBM SPSS statistical program, version ٢٢, was used to enter and analyses the data. The categorical variables were described

using the mean, standard deviation, and percentages. The difference between the quantitative variables was determined using the t-test. To examine the relationship between categorical variables, the Chi-Square test was performed. The p-value was deemed to be significantly at lower than ٠,٠٥ and highly significant at ٠,٠٠١

Results

Table ١ illustrations that nearly two thirds of the studied women [٦٥,٣ % and ٤٠% respectively] were under the age of ٢٠ and had just an elementary education. Furthermore, ٦٠,٧ % of them lived in cities and slightly more than three-quarters (٧٥,٣ % and ٧٧,٣ %, respectively) were unemployed and had insufficient income.

Table ٢ shows that the mean age at first menstruation, menses days, and menstrual cycle length were ١١,٢ ± ١,٢ year, ٧,٣ ± ١,٣ day, and ٢٦,٢ ± ٢,٧ day, respectively. Furthermore, the mean duration of infertility was ٥,٥–٢,٣ years, and ٤٤% of them had undergone pelvic surgery.

Table ٣ revealed that more than three-quarters of the studied women (٧٩,٣ % and ٧٧,٣ % respectively) suffer from painful periods (dysmenorrhea) and pain with intercourse. Furthermore, at any point of their menstrual cycle, ٤٨ % and ٥٠,٧ %

respectively reported menstrual irregularity and vaginal bleeding between menstrual cycle and, more than half of them [53,3 %] infertile. Concerning problem associated with endometriosis nearly one third of the studied women had adhesions [32,7 %] and a quarter of them had chocolate ovarian cyst (20 %).

Table 4 demonstrates that about half of the women (47%) had a moderate degree, a mild degree (22,7%), and a severe degree (12%) of endometriosis. As regards to categories of endometriosis diagnosed by laparoscopy, 26,7 % had unilateral endometriosis and 24,7 % had bilateral endometriosis.

Table 5 shows that 29,3% and 80,7% of women had a poor level of knowledge and incorrect practices of endometriosis before adopting coping strategies, respectively. However, 54,7% and 86,7% of them had a good level of knowledge and correct practice of endometriosis after adopting coping strategies. In addition, before adopting coping strategies, the average knowledge and practice scores for endometriosis were $5,91 \pm 2,93$ and $7,80 \pm 4,43$, respectively,

compared to $35,81 \pm 3,27$ and $36,20 \pm 4,01$, respectively, with significant improvement after adopting coping strategies ($P \leq 0,0001$ and $P \leq 0,0001$ respectively).

Table 6 illustrates that 54,7% of women had moderate pain intensity with the mean pain score was $8,32 \pm 17,61$ regarding endometriosis symptoms before coping strategies were adopted. While after adopting coping strategies, 60,7% of them had mild pain with a mean pain score of $3,11 \pm 14,97$, respectively. There is a significant difference in the pain score before and after the adoption of coping strategies ($P < 0,0001$).

Table ١. Characteristics of women diagnosed with endometriosis (n=١٥٠).

Item	Frequency	Percent
Age [years]		
١٨- < ٢٠	٩٨	٦٥,٣%
٢٠- < ٣٠	٢٢	١٤,٧%
٣٠- > ٤٠	٣٠	٢٠,٠%
Educational level		
Illiterate	١٠	٦,٧%
Primary school	٦٠	٤٠,٠%
Secondary school	٥٠	٣٣,٣%
College or above	٣٠	٢٠,٠%
Place of Residence		
Urban	٩١	٦٠,٧%
Rural	٥٩	٣٩,٣%
Working status		
Worked	٣٧	٢٤,٧%
Not worked	١١٣	٧٥,٣%
Level of income		
Sufficient	٣٤	٢٢,٧%
Insufficient	١١٦	٧٧,٣%

Table ٢. Menstrual and gynecological history of women diagnosed with endometriosis (n=١٥٠).

Items	Mean \pm SD	
Age of first menstruation [years]	١١,٢ \pm ١,٢	
Menses [days]	٧,٣ \pm ١,٣	
Length of the menstrual cycle [days]	٢٦,٢ \pm ٢,٧	
Duration of infertility [years]	٥,٥ \pm ٢,٣	
	Frequency	Percent
History of pelvic surgery		
Yes	٦٦	٤٤%
No	٨٤	٥٦ %

Table ٣: Signs, symptoms, and problems of women diagnosed with endometriosis (n=١٥٠).

Items	Frequency	Percent
Symptoms of endometriosis		
Dysmenorrhea (Painful periods)	١١٩	٧٩,٣
Dyspareunia (Pain with intercourse)	١١٦	٧٧,٣
Irregularity of the menstrual cycle	٧٢	٤٨,٠
Vaginal bleeding between menstrual cycle	٧٦	٥٠,٧%
Heavy menstruation	٥٦	٣٧,٣
Digestive symptoms	٥٧	٣٨,٠
Urinary symptoms	٤٥	٣٠,٠
Signs of endometriosis		
١ ^{ry} Infertility	٨٠	٥٣,٣
٢ nd Infertility	٧١	٤٧,٣
Problems of endometriosis		
Internal scarring	٦	٤,٠
Adhesions	٤٨	٣٢,٠
Frequent absence from work	٢٧	١٨,٠
Ureteral obstruction	١٠	٦,٧
Intestinal obstruction	٢٤	١٦,٠
Chocolate cyst on the ovaries	٣٠	٢٠,٠

N.B: The total is not exclusive because some women had more than one problem and symptom.

Table ٤. Endometriosis degrees and classifications as determined by laparoscopic examination [n=١٥٠].

Items	Frequency	Percent
Degrees of endometriosis diagnosed by laparoscopy		
Minimal [١ st degree]	٢٧	١٨٪
Mild [٢ nd degree]	٣٤	٢٢,٧٪
Moderate [٣ rd degree]	٧١	٤٧,٣٪
Severe [٤ th degree]	١٨	١٢,٠٪
Categories of endometriosis diagnosed by laparoscopy		
Unilateral ovarian endometriosis	٤٠	٢٦,٧
Bilateral ovarian endometriosis	٣٧	٢٤,٧
Pelvic endometriosis	١٢	٨,٠
Rectovaginal endometriosis	١٣	٨,٧
Ovarian and rectovaginal endometriosis	١٣	٨,٧
Bowel endometriosis	٥	٣,٣
Urinary tract endometriosis	١٠	٦,٧
Deep infiltrating pelvic endometriosis	١٢	٨,٠
More than one	٧	٤,٧

N.B: The total is not exclusive because some women had more than one category.

Table ٥. Knowledge and practice of women with endometriosis before and after adopting coping strategies (n=١٥٠).

Items		Adopting coping strategies				X ^۲ -test	P-value
		Before		After			
		No	%	No	%		
Level						۱۰,۳۹	۰,۰۰۱
Knowledge	Poor	۱۱۹	۷۹,۳	۲۳	۱۵,۳		
	Good	۳۱	۲۰,۷	۱۲۷	۸۴,۷		
Practice	Incorrectly done/not done	۱۲۰	۸۰,۰	۳۱	۱۴.	۹.۵۵	۰,۰۲
	Correctly done	۳۰	۲۰,۰	۱۲۹	۸۶,۰		
Mean ±SD						t-test	P-value
Knowledge score		۵,۹۱±۲,۹۳		۳۵,۸۱±۳,۲۷		-۸۱,۶۵۸	< ۰,۰۰۰۱
Practices score		۷,۸۵±۴,۴۳		۳۶,۲۵±۴,۵۱		-۵۸,۲۵۰	< ۰,۰۰۰۱

Table ٦: Pain related to endometriosis symptoms in women before and after adopt coping strategies (n=١٥٠).

Pain related with endometriosis symptoms	Adopting coping strategies				X ^Y -test	P-value
	Before		Before			
	No	%	No	%		
Severity of pain					11,67	0,04
Mild	16	10,7%	91	60,7%		
Moderate	81	54,0%	40	30,0%		
Severe	53	35,3%	14	9,3%		
Mean score of pain					t-test	P-value
Mean ±SD	8,32±17,61		3,11±14,97		11,049	<0,000 ^{***}

Discussion

Endometriosis is a recurrent and chronic illness. It affects 6-10% of women of reproduction age, with 20-50% of those affected infertile and 71-87% are suffering from persistent pelvic pain. ^[19]

Endometriosis is characterized by both specific and generalized symptoms. Dysmenorrhea, cyclic and non-cyclic pelvic discomfort, dyschezia, dysuria, and dyspareunia are some of the specific symptoms. Intestinal and bladder problems, pain spreading into the legs, and associated complaints such as vomiting, headache, dizziness, painful periods, irregular pelvic pain, lower back pain, and persistent exhaustion are the nonspecific symptoms. Chiantera, V., et al (2017)⁽²⁰⁾.

According to the present findings, nearly two thirds of women were between the ages of 18 and 20. Eisenberg, V. H., et al (2018)⁽²¹⁾ on the other hand, concluded that a significant percentage of endometriosis was found among women aged 20 to 29. The current findings showed that most women with primary education and those living in urban regions had the highest percentages of endometriosis. Furthermore, the majority of them were unemployed and had insufficient income. These findings

contrast with those of Peters, K. M., et al (2014)⁽²²⁾ who found that endometriosis was common in educated women. This may be due to cultural differences and barriers as Arab women are less likely to see and consult a gynecologist, and a lack of education leads to a delay in endometriosis diagnosis.

The mainstream of women with endometriosis experienced dysmenorrhea, pain during sexual intercourse, irregular menstrual cycles, vaginal bleeding between menstrual cycles, and primary infertility, according to the current study. This conclusion supports up the findings of Parazzini, F., et al (2013)⁽²³⁾ who found that endometriosis is associated with menstrual cycle duration, the intensity of menstrual flow, and dysmenorrhea.

Markham, R., et al. (2019)⁽²⁴⁾, who studied 529 women with endometriosis and 208 women without an existing gynecological complaint, found that all pain manifestations were common among women with endometriosis. They also stated that endometriotic patients had dysmenorrhea, dyspareunia, lower back pain, ovulatory pain, pelvic pain not related to menstruation, dysuria, and rectal pain. In addition, there was a strong association between the

intensity of dysmenorrhea, frequency of dyspareunia, and other pain symptoms.

Furthermore, Saha, R., et al (2017)⁽²⁰⁾ found a link between profound dyspareunia and endometriosis. Women with endometriosis had more complaints of pain with sexual relation, dyschezia, and dysuria, according to Schliep, K. C., et al (2010)⁽²¹⁾. Women with endometriosis rated their pain as "strong and progressing during menstrual and non-menstrual stages" in a qualitative research conducted by Moradi, M., et al (2014)⁽²²⁾. Endometriosis symptoms include persistent pelvic pain, dysmenorrhea, dyspareunia, and infertility, according to Luciano & Luciano (2011)⁽²³⁾ reported that endometriosis can induce symptoms arising from other organs such as dyschezia, tenesmus, dysuria, and hematuria.

According to the results of the current study, adhesions and chocolate ovarian cyst were the most common signs of endometriosis. These results are comparable with a study of 480 patients with endometriosis by Hao, M., et al (2009)⁽²⁴⁾ examining the incidence of pelvic adhesions and the relationship between pelvic adhesions and pain symptoms in women with endometriosis. They found that the majority of peritoneal adhesions were specific to endometriosis.

Nurses must design and develop realistic techniques to manage pain related to symptoms of endometriosis. Positive coping strategies for endometriosis pain were found to have a significant effect on pain relief in women with endometriosis symptoms. According to Roomaney, R., and Kagee, A (2016)⁽²⁵⁾ patients can organize activities and plan for coping with the diseases because endometriosis discomfort is repetitive.

The majority of women with endometriosis diagnosed by laparoscopy had a moderate degree of endometriosis (3rd degree). This agrees with Shah and Adlakh (2014)⁽²⁶⁾ who discovered that the majority of women had endometriosis in stages III and IV. This consistency in findings could be due to the fact that most women with endometriosis present late. This study also shows that most of women with endometriosis diagnosed by laparoscopy had ovarian endometriosis, which is in agreement with ---. Ovarian endometriosis was more common among women in their reproductive years, Zhu, J., et al. (2018)⁽²⁷⁾.

According to the current study, women's knowledge improved significantly after they adopted coping methods, with statistically significant improvements (P < 0.001). This

conclusion is consistent with a research conducted at EL Mansoura University by Abd El-Mouty, S. M., et al. (2016)⁽²⁷⁾ to educate 160 female workers from various faculties about endometriosis. They detected a significant difference in the participants' level of knowledge after the educational and follow-up sessions than before the educational sessions. Women's knowledge of endometriosis increases significantly as a result of the endometriosis education and health sessions that are planned and implemented.

Similarly, Jacobsson, L. R., et al. (2012)⁽²⁸⁾ who reported that women with endometriosis benefit from more information and support in order to improve their coping ability. As a result, the study suggests that health care providers should provide women with knowledge about how to deal with endometriosis such as limited physical activity, healthy diet or exercise schedules, as well as work or home activities, social relationships during menstruation, and self-managing approaches (relaxation or exercises). These practices have a significant effect in controlling and dealing with symptoms of endometriosis.

The practices of women with endometriosis improved after adoption of the positive

coping strategies with a statistically significantly difference ($P < .000$) according to the current study. Similarly, Roomaney, R., and Kagee, A (2016)⁽²⁹⁾ conducted a study in South Africa on coping strategies used by women with endometriosis in the public health care system. They found that problem-solving and emotion-management strategies helped them cope with endometriosis. The present study findings is also support those of Gaston-Johansson, F., et al. (2013)⁽³⁰⁾ who found that self-statements, prayer, and positive behavior activity were the most popular coping strategies utilized by breast cancer patients receiving chemotherapy. The present research findings proved that nurses and other health care providers can help women with endometriosis to adopt positive coping strategies through health education to improve their health and wellbeing.

Conclusion

Adoption of Positive coping strategies had a significant effect on women's knowledge, practice related to endometriosis. So, the research hypothesis is met based on the finding of the present study.

Recommendations

The findings point to the importance of researching and adopting coping strategies

and ways that can assist women in dealing with endometriosis and referring them to relevant resources.

Limitations of the study

Because many women were unaware of endometriosis symptoms and were discharged from the hospital within ٢-٣ hours of laparoscopic surgery, this study was limited by its small sample size. However, it is generalizable in the same conditions and locations

References

١. Koninckx, P. R., Ussia, A., Adamyan, L., Wattiez, A., Gomel, V., & Martin, D. C. Pathogenesis of endometriosis: the genetic/epigenetic theory. *Fertility and sterility*, ٢٠١٩; ١١١(٢), ٣٢٧-٣٤٠.
٢. Soliman, A. M., Coyne, K. S., Zaiser, E., Castelli-Haley, J., & Fuldeore, M. J. The burden of endometriosis symptoms on health-related quality of life in women in the United States: a cross-sectional study. *Journal of Psychosomatic Obstetrics & Gynecology*, ٢٠١٧; ٣٨(٤), ٢٣٨-٢٤٨.
٣. Fisher, C., Adams, J., Hickman, L., Sibbritt, D. The use of complementary and alternative medicine by ٧٤٢٧ Australian women with cyclic perimenstrual pain and discomfort: a cross-sectional study. *BMC complementary and alternative medicine*, ٢٠١٦; ١٦(١), ١-١١.
٤. Nisenblat, V., Prentice, L., Bossuyt, P. M., Farquhar, C., Hull, M. L., & Johnson, N. Combination of the non-invasive tests for the diagnosis of endometriosis. *Cochrane Database of Systematic Reviews*. ٢٠١٦, (٧).
٥. Vos, T., Barber, R. M., Bell, B., Bertozzi-VA., Biryukov, S., Bolliger, I., Brugha, T. S. Global, regional, and national incidence, prevalence, and years lived with disability for ٣٠١ acute and chronic diseases and injuries in ١٨٨ countries, ١٩٩٠-٢٠١٣: a systematic analysis for the Global Burden of Disease Study ٢٠١٣. *The lancet*, ٢٠١٥; ٣٨٦(٩٩٩٥), ٧٤٣-٨٠٠.
٦. De Wilde, R. L., Alvarez, J., Brölmann, H., Campo, R., Cheong, Y., Lundorff, P., Wallwiener, M. Adhesions and endometriosis: challenges in subfertility management. *Archives of gynecology and obstetrics*, ٢٠١٦; ٢٩٤(٢), ٢٩٩-٣٠١.
٧. Adamson, G. D., Kennedy, S., Hummelshoj, L. Creating solutions in endometriosis: global collaboration through the World Endometriosis Research Foundation, ٢٠١٠.

٨. Schrager, S. B., Falleroni, J., Edgoose, J. Evaluation and treatment of endometriosis. American family physician, ٢٠١٧; ٨٧(٢), ١٠٧-١١٣.
٩. American College of Obstetricians and Gynecologists. Endometriosis. Retrieved October ٣١, ٢٠٢٠, from <https://www.acog.org/Patients/FAQs/Endometriosis>.
١٠. Lazarus, R. S., & Folkman, S. Transactional theory and research on emotions and coping. European Journal of personality, ١٩٨٧; ١(٣), ١٤١-١٦٩.
١١. Auduly, Å., Asplund, K., & Norbergh, K. G. The integration of chronic illness self-management. Qualitative health research, ٢٠١٢; ٢٢(٣), ٣٣٢-٣٤٥.
١٢. American Society of Reproductive Medicine Classification of endometriosis. Fertil Steril J, ١٩٧٩; ٣٢(١): ٦٣٣-٤.
١٣. Sayed, H. A. E., & Aboud, S. A. H. H. Effect of an educational intervention on quality of life and sexual function in women with endometriosis. International Journal of Studies in Nursing, ٢٠١٨; ٣(٢), ١٢٧.
١٤. Childs, J. D., Piva, S. R., Fritz, J. M. Responsiveness of the numeric pain rating scale in patients with low back pain. Spine, ٢٠٠٥; ٣٠(١١), ١٣٣١-١٣٣٤.
١٥. Bijur, P. E., Latimer, C. T., Gallagher, E. J. Validation of a verbally administered numerical rating scale of acute pain for use in the emergency department. Academic emergency medicine, ٢٠٠٣; ١٠(٤), ٣٩٠-٣٩٢.
١٦. Williamson, A., & Hoggart, B. Pain: a review of three commonly used pain rating scales. Journal of clinical nursing, ٢٠٠٣; ١٤(٧), ٧٩٨-٨٠٤.
١٧. Roomaney, R., Kagee, A. Coping strategies employed by women with endometriosis in a public health-care setting. Journal of health psychology, ٢٠١٦; ٢١(١٠), ٢٢٥٩-٢٢٦٨.
١٨. Altman, G., Wolczyk, M. Endometriosis: overview and recommendations for primary care nurse practitioners. The journal for nurse practitioners, ٢٠١٠; ٦(٦), ٤٢٧-٤٣٤.
١٩. American College of Obstetricians and Gynecologists. Practice bulletin no. ١١٤: management of endometriosis. Obstet Gynecol, ٢٠١٠; ١١٦(١), ٢٢٣-٢٣٦..
٢٠. Chiantera, V., Abesadze, E., Mechsner, S. How to understand the complexity of endometriosis-related pain. Journal of

- Endometriosis and Pelvic Pain Disorders, ٢٠١٧; ٩(١), ٣٠-٣٨.
٢١. Eisenberg, V. H., Weil, C., Chodick, G., & Shalev, V. Epidemiology of endometriosis: a large population-based database study from a healthcare provider with ٧ million members. *BJOG: An International Journal of Obstetrics & Gynaecology*, ٢٠١٨; ١٢٥(١), ٥٥-٦٢.
٢٢. Peters, K. M., Wrigley, P., Fraser, I. The cost of endometriosis in Australia. In ١٢th World Congress on Endometriosis, ٢٠١٤; (٣٠).
٢٣. Parazzini, F., Cipriani, S., Bravi, F., Pelucchi, C., Chiaffarino, F., Ricci, E., & Viganò, P. (). A metaanalysis on alcohol consumption and risk of endometriosis. *American journal of obstetrics and gynecology*, ٢٠١٣; ٢٠٩(٢), ١٠٦-١٥
٢٤. Markham, R., Luscombe, G. M., Manconi, F., Fraser, I. S. (). A detailed profile of pain in severe endometriosis. *Journal of Endometriosis and Pelvic Pain Disorders*, ٢٠١٩; ١١(٢), ٨٥-٩٤.
٢٥. Saha, R., Marions, L., Tornvall, P. Validity of self-reported endometriosis and endometriosis-related questions in a Swedish female twin cohort. *Fertility and sterility*, ٢٠١٧; ١٠٧(١), ١٧٤-٨.
٢٦. Schliep, K. C., Mumford, S. L., Peterson, C. M., Chen, Z., Johnstone, E. B., Sharp, H. T., Buck Louis, G. M. Pain typology and incident endometriosis. *Human reproduction*, ٢٠١٥; ٣٠(١٠), ٢٤٢٧-٣٨.
٢٧. Moradi, M., Parker, M., Sneddon, A., Lopez, V., Ellwood, D. Impact of endometriosis on women's lives: a qualitative study. *BMC women's health*, ٢٠١٤; ١٤(١), ١-١٢.
٢٨. Luciano, D. E., Luciano, A. A. Management of endometriosis-related pain: an update. *Women's Health*, ٢٠١١; ٧(٥), ٥٨٥-٥٩٠.
٢٩. Hao, M., Zhao, W. H., & Wang, Y. H. Correlation between pelvic adhesions and pain symptoms of endometriosis. *Zhonghua fu chan ke za zhi*, ٢٠٠٩; ٤٤(٥), ٣٣٣-٦.
٣٠. Shah, P. R., Adlakha, A. Laparoscopic management of moderate: Severe endometriosis. *Journal of minimal access surgery*, ٢٠١٤; ١٠(١), ٢٧.
٣١. Zhu, J., Arsovska, B., Sterjovska-Aleksovska, A., & Kozovska, K. Acupuncture treatment of subfertility and ovarian endometrioma. *Open access*

٢٢. Macedonian journal of medical sciences, ٢٠١٨; ٦(٣), ٥١٩.
٢٣. Abd El-Mouty, S. M., Al_Wehedy, A., Hassan, S. I Raising Awareness of Working Women in Mansoura University towards Endometriosis: A Follow up Study. IOSR Journal of Nursing and Health Science; ٢٠١٦; ٥(٥): ١٩٥٩-٢٣٢٠.
٢٤. Jacobsson, L. R., Hallert, C., Milberg, A., & Friedrichsen, M. Coeliac disease—women's experiences in everyday life. Journal of clinical nursing, ٢٠١٢; ٢١(٢٣-٢٤), ٣٤٤٢-٥٠..
٢٥. Gaston-Johansson, F., Haisfield-Wolfe, M. E., Reddick, B., Goldstein, N., Lawal, T. A. The relationships among coping strategies, religious coping, and spirituality in African American women with breast cancer receiving chemotherapy. In Oncology Nursing Forum, ٢٠١٣; ٤٠, (٢).

Effect of Educational Program for Nurses on Clinical Outcomes of Cancer patients with Metastatic Spinal Cord Compression

'Shaimaa Abd El Salam. Khalil, 'Sheren Mohammed.Diab, 'Mohammed A. Alam El-Din, 'Om Ebrahiem Ali. El-Melegy

'Assistant lecturer, Medical –Surgical Nursing, Faculty of Nursing, Tanta University, Egypt.

'Lecturer of Critical Care and Emergency Nursing Tanta University, Egypt

. 'Professor of Clinical Oncology, Faculty of Medicine, Tanta University, Egypt.

'Professor of Medical- Surgical Nursing Faculty of Nursing, Tanta University, Egypt

Abstract

Background: Spinal cord compression is a common oncological emergency that requires early detection and prompt treatment as it can result in permanent neurological deficit. Nurses are often involved in supporting patients living with cancer. They may be the first healthcare professional to recognize the “red flag” symptoms of MSCC. Early recognition by the nurses will prompt timely investigation, treatment and potentially reduce the risks of patient’s having a permanent disability. **Aim:** To determine the effect of educational program for nurses on clinical outcomes of cancer patients with Metastatic Spinal Cord Compression. **Method:** Design, A quasi- experimental research design was utilized in this study .Setting, the study was conducted at Clinical Oncology and Nuclear Medicine Department at Tanta University Hospital.. **Subjects:** convenience sample of ٤٠ nurses and ٣٠ cancer patients. **Tools:** **Tool I:** Structured Interview Schedule. **Tool II:** Nursing Care Observational Checklist. **Tool III:** Patient's Assessment Structured Interview Schedule. **Tool (IV):** Patient's Outcomes sheet. **Results :** a highly significant difference was noticed related to the total level of knowledge and practice of studied nurses through periods of study (pre-immediate and post one month assessment periods) with P value= ٠,٠٠٠١. A highly significant difference was found related to the total level of knowledge for the studied patients thought the periods of the study as P value =٠,٠٠٠١. **Conclusion:**The oncology nurse's knowledge and practice improved significantly after attendance of program sessions. **Recommendation:** Conduct periodical training programs, workshops and seminars for oncology nurses to refresh their knowledge, and practice about metastatic spinal cord compression and its early detection and management.

Key words: Metastatic, spinal cord compression, red flag, educational program.

Introduction

Metastatic spinal cord compression can be defines as an oncological emergency and serious complications of metastatic cancer(cancer cells spread to the spine) or cancer disease progression in which the spinal cord becomes compressed through direct pressure of the tumor. Patients with suspected MSCC can experience inappropriate delays in accessing their acute care in medical services ^(١). Although the exact incidence of SCC isn't known, it's estimated to affect ٥% of patients with cancer; the incidence is reported at ١٠% in patients with spinal metastases. In the United States, more than ٢٠,٠٠٠ cases of MSCC are reported each year ^(٢-٤).

MSCC is a feature of advanced cancer, commonly seen in patients with breast, lung and prostatic cancer which estimated ٦٠% of cases. It can be also seen in patients with solid tumors as renal, gastrointestinal and pelvic which typically impact the lumbosacral spine. Tumors may spread to the spine vertebro-venous plexus, or by direct invasion ^(٥, ٦).The most common presenting feature and often the first symptom for spinal metastases are

increasing back pain. Spinal pain may be the only symptom as the tumor puts more pressure on the spine; the signs and symptoms become worse and more serious. The pain may be localized or generalized and is due to compression, pathological fractures, Pain is reported by ٩٠ to ٩٨ % of all cases. ^(٧-١٠).

Usually the progression of other symptoms of spinal cord compression as motor, sensory, autonomic, bowel and bladder dysfunction may occur slowly. Tingling, numbness, clumsiness, stiffness and heaviness of the limbs may be the early signs of motor deficit they may present with an unsteady gait or ataxia (failure of muscle co-ordination) and foot drop ^(١١, ١٢).

Treatment depends on the type of tumor, its location, the level and severity of the compression and the patient's functional level. SCC treatment is usually effective and includes the following: Radiation therapy is the standard treatment; it resolves pain by decreasing or shrinking the tumor mass ^(١٣-١٤).Treatment in the early stages of The first-line treatment for severe pain in patients with SCC is opioids. No steroidal anti-inflammatory drugs may also be used if pain isn't severe. Adjuvant therapies, including antidepressants, antiepileptic drugs, or

steroids, may be prescribed to augment the effects of analgesics^(١٥, ١٦).

Surgery is preferred in the presence of spinal instability and neurological signs in patients who have a moderate to good prognosis. Patients might be given radiotherapy once have recovered from surgery, to shrink any areas of cancer that might be left in the spine^(١٧-٢٠). Radiotherapy treatment aims to shrink the cancer cells that are pressing on the spinal cord^(٢١).

Nurses play a vital role in the detection and management of SCC. After diagnosis of this oncologic emergency, the nurse will assist with stabilizing the patient's clinical status and work to prevent further complications^(٢٢-٢٣). Nursing role can be concluded in many steps as assessment of patient airway and necessitating emergency end tracheal intubation specially if the tumors located in the cervical spine may alter pulmonary function, neurological assessment, optimize patient mobility and mitigate sequelae of immobility, assessment and care of the skin and risk for pressure ulcer development, assessment of bowel and bladder functions and also patient education and support^(٢٤-٢٦). Nursing assessment usually consists of two main domains, taking the patients health history and physical examination. The

history of the symptoms and disease process will help determine if the patient is experiencing autonomic dysfunction^(٢٧-٢٩). Therefore, Nurses play a vital role in the management of SCC. The nurse will assist with stabilizing the patient's clinical status and work to prevent further complications, and also play an important role in the rehabilitation of the patients and their families before and after hospital discharge, so this study was done to evaluate the effect of educational program for nurses on clinical outcomes of cancer patients with metastatic Spinal Cord Compression^(٣٠-٤٧).

Aim of the study: To determine the effect of educational program for nurses on clinical outcomes of cancer patients with Metastatic Spinal Cord Compression.

Research hypothesis

Improvement of oncology nurses knowledge and practice.

-Cancer patients who receive nursing intervention about Metastatic Spinal Cord Compression (MSCC) were exhibited to improve their knowledge and clinical outcomes.

Study design

Setting

The study was conducted at Clinical Oncology and Nuclear Medicine Department at Tanta University Hospital. The hospital has ٧ floors for males and females consist of ٥ wards, eachward contains ٦ beds (The capacity of the two units includes ٣٠ beds).

Subjects

The sample of this study will consist of:

- a) A convenient sample of ٤٠ nurses.
- b) A purposeful sample of ٣٠ adult patients of both sexes.

Tools: The data of the study collected using four tools:

Tool (I): Structured Interview Schedule:

This tool was developed by the researcher after reviewing of the related literature^(٤٨) and it included two parts:

Part one: "Nurses' Socio-Demographic data" This includes: nurses' code, age, sex, marital status, experience in general nursing and in oncology department and their previous training programs.

Part two: Nurses' Knowledge Assessment Sheet:

It was constructed by the researcher after reviewing of related literature^(٤٩) and used to assess the nurse's knowledge before and after implementation of pre and post education program regarding Metastatic spinal cord compression.

Scoring system of nurses' knowledge assessment

All nurses need to choose one or more correct answer to each question. Three levels of knowledge scoring for questions as the following: Correct and complete answer scored (٣) While Correct and incomplete answer scored (١) and wrong and don't know (٠).

Tool (II): Nursing Care Observational Checklist

This tool was developed by the researcher based on review of relevant literature^(٥٠) to assess the actual nursing care provided for patients with Metastatic spinal cord compression (MSCC) before and after implementation of the Educational program.

Scoring system

The total scoring system was as following:

A correct practice scored (١) score, while the incorrect (zero) score. The total score will be categorized as (٧٠٪ and more) considered as satisfactory level of practice and (less than ٧٠٪) considered as unsatisfactory level of practice.

Tool (III): Patient's Assessment Structured Interview Schedule

This tool was developed by the researcher to collect baseline data based on review of

relevant literature ^(٥١) and it included two parts

Part one: Patient Socio-demographic and medical data

-Socio-demographic data include: patient's age, sex, marital status, educational level, occupation.

-Medical data include: date of admission, diagnosis, previous and duration of hospitalization, past and present medical history, family history...etc.

Part two: Patient's knowledge assessment tool:

This tool was developed by the researcher based on review of relevant literature ^(٥٢) to assess patient's knowledge about the disease.

Scoring system

The total score of patient's knowledge was calculated and classified as following:

Correct answer scored (١), while incorrect or incomplete answer scored (٠).

Tool (IV): Patient's Outcomes sheet: It was consist of two parts to assess patient physical and psychological outcomes which include:

Part (١): Physical assessment tool:

This part was developed by the researcher and consists of ٧ parts:

Part A: Spinal Cord Independence Measurer scale

This scale was developed by Catz et al ١٩٩٧ ^(٥٣) was be adopted by the researcher and to assess the Confidentiality and Privacy of the studied patients was maintained. patient's activity of daily living which included three items as the following:

١) Self-care (feeding, grooming, bathing, and dressing).

٢) Respiration and sphincter management.

٣) Mobility (bed and transfers and indoor/outdoor).

Scoring System:

Scores range from (٠-١٠٠), where a score of ٠ defines total dependence and a score of ١٠٠ is indicative of complete independence. Each subscale score is evaluated within the ١٠٠-point scale (self-care: ٠-٢٠; respiration and sphincter management: ٠-٤٠; mobility: ٠-٤٠).

Part B: Pain Assessment Tool:

This tool was developed by Jensen et al at ١٩٩٢ ^(٥٤) and was adopted by the researcher and to assess pain severity using the Numerical rating scale (NRS) which has internal validity and a reliability coefficient of ٠,٩٥.

Scoring system: classified into (no pain (٠), mild (١-٣), moderate (٤-٦), severe (٧-٩) and worse pain.

Part (٢): Psychological assessment tool

Anxiety assessment Scale: Beck anxiety inventory (BAI) ^(٥٥).

This scale and was developed by Beck et al (١٩٨٨) and was adopted by the researcher to assess the patient and family emotions, mood and anxiety level related to disease and treatment.

It uses a four point rating scale ranging from not at all(٠), mildly but it didn't bother(١), moderately: it was very unpleasant, but I could stand it(٢), severely: I could barely stand it(٣). Anxiety levels are defined as minimal (٠-١), mild (١-٢), moderate (٢-٣), and sever (٣-٤).

Methods: The study was accomplished through the following steps:

Administrative process

١-An official hospital permission and written approval to carry out the study was obtained from the responsible authority of Tanta oncology and Nuclear Medicine Department before conducting this study through official letters from Faculty of Nursing explaining the purpose of the study.

٢. Ethical consideration

- Informed and written consent was obtained from every nurse & patient and caregiver included in the study after explanation of the aim of the study.

- They were informed that participation is voluntary and that they could withdraw at any time of the study.
- Confidentiality and autonomy were maintained by the use of code number instead of name.
- Consent from the faculty's ethical committee was obtained before the study conduction.

٣. Validity of the tools

- All tools were tested for content validity by nine jury of experts in the field of Medical-Surgical nursing, critical care nursing at the faculty of Nursing, and oncology field professors and accordingly needed modifications were done.

٤. Reliability of the tools.

Reliability statistics:

- Alpha Cronbach's test was used to test tool reliability and reliability factor was = ٠,٨٩٦.
- Cronbach's Alpha for Tool ١ is ٠,٩١٢ applied on ٥ nurses.
- Cronbach's Alpha for Tool ٢ is ٠,٨٧٣ applied on ٥ nurses.
- Cronbach's Alpha for the sheet of nurses in total is ٠,٨٩٤ applied on ٥ nurses.
- Cronbach's Alpha for Tool ٤ is ٠,٩٤ items applied on ٥ patients.

٥. A pilot study

It was conducted before the actual study on ١٠% of the patients (Five nurses and five cancer patients), in order to test the clarity, feasibility and applicability of the different items of the developed tools Modifications, rephrasing and some additional terms were done by the researcher before the main study, according to the experience gained from this pilot study. Data obtained from those patients were excluded and not included in the current study.

- **The present study was conducted at ٣ phases as the following**

- **I- Assessment phase**

a-For nurses: -Nurses' knowledge related to cancer patients with Metastatic Spinal Cord Compression will be assessed two time pre and post (immediately and post one month) the educational program by using Tool (I) part (٢)

b-For patient's:-The researcher used Tool (III) part I at the first time of patient's admission for collection of patient's data.

II-Planning phase

This phase was formulated based on data from the assessment phase, literature review priorities, goals, determined needs, baseline measures, researches and expected outcomes criteria were taken into consideration when planning patients care.

III- Implementation Phase: Educational program for nurses regarding care of patients with Metastatic spinal cord compression was developed and implemented by the researcher based on determining needs, baseline measures, relevant literature ,researches and expected outcomes .

Educational methods and aids

Teaching methods and aids was used during the session It included: Group discussions, demonstration and re-demonstration.

Teaching aids include: Arabic language booklet, Handout, Data show presentation, lab top and posters. The booklets distributed to the studied nurses at the end of sessions.

Statistical analysis

Statistical presentation and analysis of the Present study was conducted, using the mean, and Linear Correlation Coefficient [r]tests by SPSS V٢٠.

Results

Table (١) illustrates the percentage distribution socio-demographic characteristics of the studied nurses. In relation to age, it was noticed that (٣٧,٥%) of the studied nurses ranged from (٣٠ - < ٤٠) years old. (٨٧,٥%) were females and (١٢,٥%) were males (٨٠%) were married,

(20%) were single, and there was about (70%) of the studied sample had experience from < 10 to < 20 years compared with more than two third (60%) of them had experience in oncology department.

Figure (1): showed the Levels scores of total nurses' knowledge about the disease.

It was found that there was a highly statistically significant difference as P value= 0.0001.

Table (2) showed Percent distribution of levels and mean scores of total nurses' practice about nursing care. There was a highly statistically significant difference between total practice scores through the periods of the study as P value= 0.0001.

Figure (3): Mean scores of total patients' physical assessment; It was found that the mean scores of total patients' physical assessment before implementing the program was about 88.12 compared with 97.43 after one month.

Figure (4): Levels scores of total patients' anxiety, It was noticed that (40%) of the studied patients had moderate level of anxiety before the program compared with (66.7%) after one month of implementation program.

Table (4): Relationship between total anxiety state of patient and total pain

score before and after program implementation (n=30). It was revealed that there was a significant positive correlation between the total anxiety state of patient and total pain score before and after program implementation as P value 0.026 and 0.001.

Table (5): Relationship between total knowledge, practice of the studied nurses and their socio-demographic data before and immediate after implementation the program, It was found that there was a positive correlation between total knowledge, practice of the studied nurses and their socio-demographic data before and immediate after program intervention.

Table (6) Correlation between levels of total knowledge, nurses' practice about nursing care before and after the program. It was noticed that there was a positive correlation in the immediate and one month after implementing the program.

Table (١): Percentage distribution of socio-demographic characteristics of the studied nurses. (n=٤٠)

Socio-demographic characteristics of nurses	The studied nurses (n=٤٠)	
	No.	%
Age in years:		
< ٢٠	٣	٧,٥
٢٠ - < ٣٠	١٠	٢٥,٠
٣٠ - < ٤٠	١٥	٣٧,٥
٤٠ - < ٥٠	١٠	٢٥,٠
≥ ٥٠	٢	٥,٠
Range	١٨ - ٥٦	
Mean ± SD	٣٤,٠٠٠ ± ١٠,١٠٤	
Sex:		
Male	٥	١٢,٥
Female	٣٥	٨٧,٥
Marital status		
Married	٣٢	٨٠,٠
Single	٨	٢٠,٠
Educational level		
Diplome	١٣	٣٢,٥
Intermediate education degree	٢٧	٦٧,٥
Years of experience in nursing		
< ١٠	١٣	٣٢,٥
١٠ - < ٢٠	١٥	٣٧,٥
٢٠ - < ٣٠	١٠	٢٥,٠
≥ ٣٠	٢	٥,٠
Range	٢ - ٣١	
Mean ± SD	١٣,٩٢٥ ± ٨,٦٧١	
Years of experience in oncology department		
< ١٠	١٥	٣٧,٥
١٠ - < ٢٠	١٥	٣٧,٥
٢٠ - ٣٠	١٠	٢٥,٠
Range	٢ - ٣٠	
Mean ± SD	١٢,٣٧٥ ± ٨,٠٠٨	
Previously in-service training program		
No	٤٠	١٠٠,٠

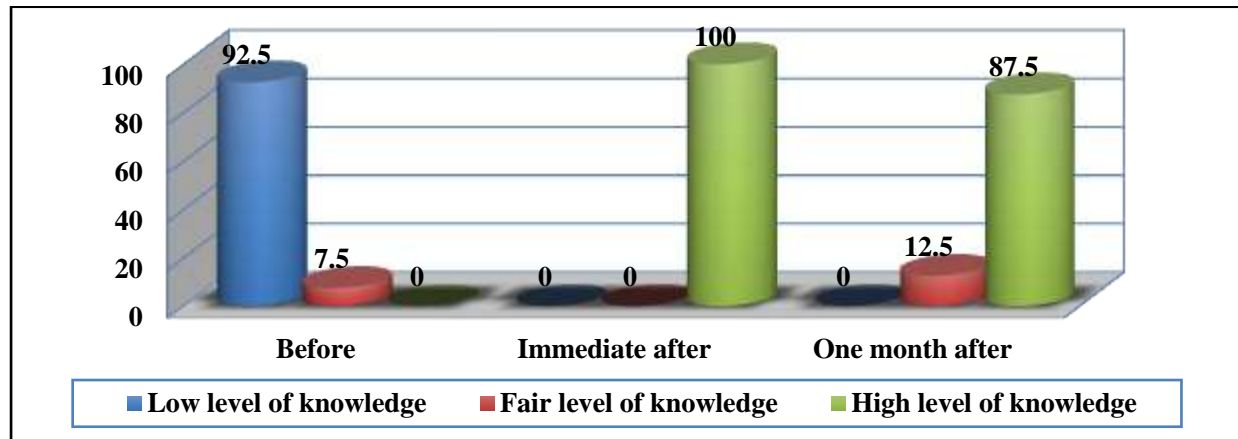


Figure (١): Levels scores of total nurses' knowledge about the disease

Table (٢): Percent distribution of levels and mean scores of total nurses' practice about nursing care

Total practice scores	Practice of the studied nurses before, immediate and one-month after program implementation (n=٤٠).						χ^2	P
	Before		Immediate after		One month after			
	(n=٤٠)		(n=٤٠)		(n=٤٠)			
	No	%	No	%	No	%		
Levels of total practice:								
Unsatisfactory level of practice < ٧٠% (٠ - ٤٨)	٤٠	١٠٠,٠	٠	٠,٠	٣	٧,٥	١٠٧,٩٣	٠,٠٠٠,١* *
Satisfactory level of practice ≥ ٧٠% - ٧٤% (٤٩ - ٦٩)	٠	٠,٠	٤٠	١٠٠,٠	٣٧	٩٢,٥		
Total practice scores:								
Range	١٩ - ٢٩		٥٩ - ٦٩		٤٧ - ٦٦			
Mean ± SD	٢٣,٠٨ ± ٢,٤٧		٦٣,٦٠ ± ٢,١٥		٥٤,٤٥ ± ٤,٤٥			
F value								
P	١٧٧٠,١٩ ٠,٠٠٠,١**							
Changes of total practice scores before and immediate after program intervention:								
Range	٣٣ - ٤٦							
Mean ± SD	٤٠,٥٢ ± ٣,٠١							
Z value	٥,٥٢٢							
P	٠,٠٠٠,١**							
Changes of total practice scores before and after one month of program intervention:								
Range	٢٣ - ٤١							
Mean ± SD	٣١,٣٧ ± ٥,٢٠							
Z value	٥,٥١٤							
P	٠,٠٠٠,١**							

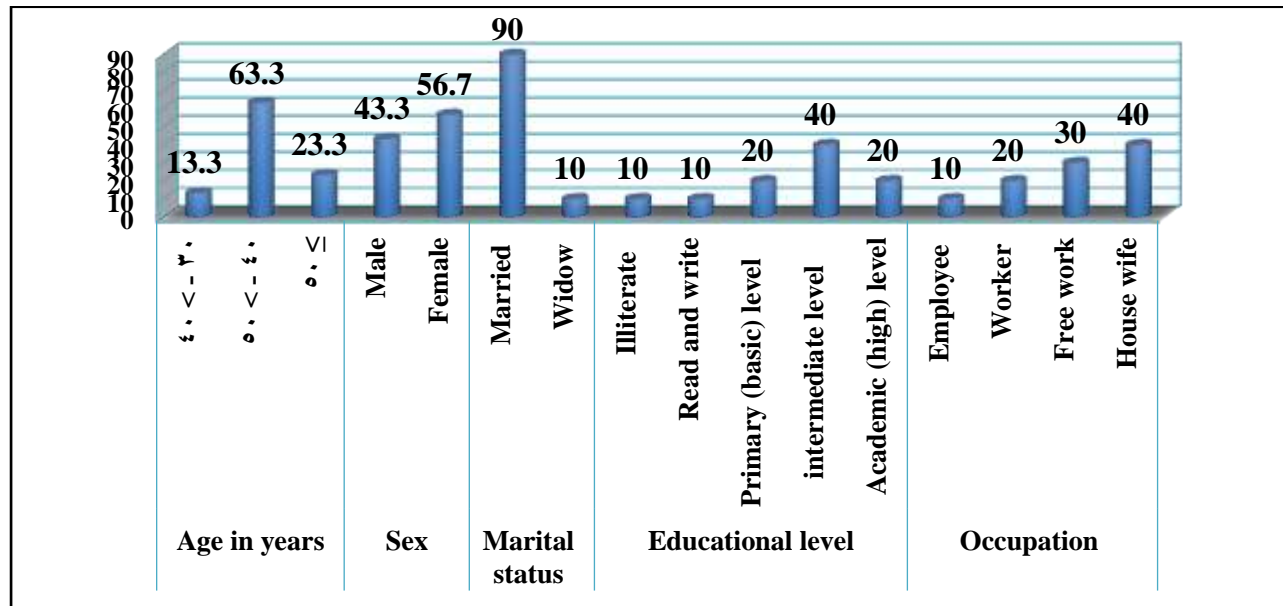


Figure (٢): Biosocial-demographic characteristics of the studied patient. (n=٣٠)

Table (٣): Percent distribution of levels and mean scores of total patients' knowledge about the disease

Total knowledge about the disease	Knowledge of the studied patients before, immediate and after one-month of program implementation (n=٣٠).						χ^2	P
	Before (n=٣٠)		Immediate after (n=٣٠)		One month after (n=٣٠)			
	No	%	No	%	No	%		
Levels of total knowledge:								
Low level of knowledge < ٦٠% (٠ - ٥)	٢٣	٧٦,٧	٣	١٠,٠	٦	٢٠,٠	٤٠,٤٤٩	٠,٠٠٠,١**
Fair level of knowledge ٦٠% - ٧٤% (٦ - ٧)	٥	١٦,٦	٣	١٠,٠	٦	٢٠,٠		
High level of knowledge (≥ ٧٥%) (٨ - ١٠)	٢	٦,٧	٢٤	٨٠,٠	١٨	٦٠,٠		
Total knowledge scores:								
Range	١ - ٨		٥ - ١٠		٤ - ٩			
Mean ± SD	٣,٩٣٣±١,٨٥		٨,٠٣٣±١,٢٧		٧,١٦٦±١,٥٥			
F value	٥٦,١٦٠							
P	٠,٠٠٠,١**							

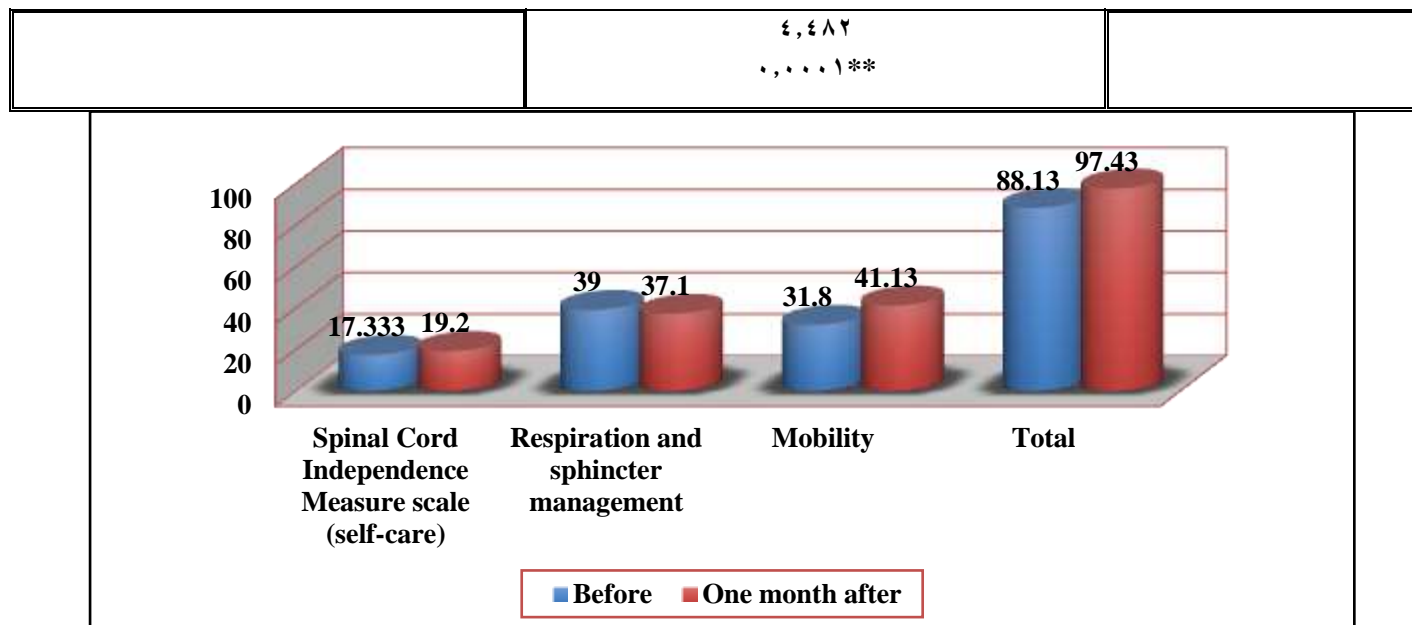


Figure (٣): Mean scores of total patients' physical assessment

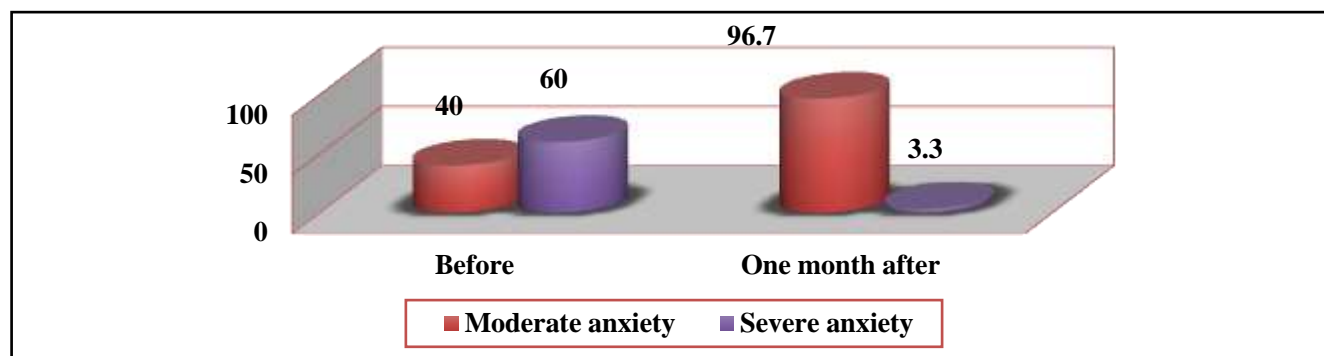


Figure (٤): Levels scores of total patients' anxiety

Table (٤): Relationship between total anxiety state of patient and total pain score about before and after program implementation (n=٣٠).

Total anxiety levels	Total pain scale of the studied patients (n=٣٠)											
	Before intervention (n=٣٠)						After implementation (n=٣٠)					
	Moderate (n=٢٤)		Severe (n=٦)		χ^2	P	Mild (n=٤)		Moderate (n=٢٦)		χ^2	P
	No.	%	No.	%			No.	%	No.	%		
Levels of total anxiety:												
Moderate anxiety	١١	٣٦,٧	١	٣,٣	١,٧٠ ١	٠,١٩٢	٤	١٣,٣	٢٥	٨٣,٣	٠,١٥ ٩	٠,٦٩٠
Severe anxiety	١٣	٤٣,٣	٥	١٦,٧			٠	٠,٠	١	٣,٣		
r	٠,٣٤٨						٠,٥٦٣					
P	٠,٠٢٦*						٠,٠٠١*					

r=Correlation Coefficient*Statistically Significant difference at (P<٠,٠٥)

Table (٥): Relationship between total knowledge, practice of the studied nurses and their socio-demographic data immediate after than before program intervention

Socio-demographic data	Mean change of total knowledge scores among the studied nurses immediate after than before (n=٤٠)		Mean change of total practice scores among the studied nurses immediate after than before (n=٤٠)	
	Mean \pm SD	χ^2 Value P	Mean \pm SD	χ^2 Value P
Age (years):				
<٢٠	٢٠,٦٦ \pm ٦,٠٢	١,٦٤٦ ٠,٨٠٠	٤١,٣٣ \pm ١,١٥	١,٠١٤ ٠,٩٠٨
٢٠ - <٣٠	٢٤,٨٨ \pm ٦,٨٤		٤١,٣٠ \pm ٢,٢٦	
٣٠ - <٤٠	٢٣,٧٣ \pm ٥,٣٥		٤٠,٠٠ \pm ٣,٥٢	
٤٠ - <٥٠	٢٢,١٠ \pm ٥,٦٠		٤٠,٣٠ \pm ٢,٩٤	
≥ ٥٠	٢٥,٥٠ \pm ٠,٧٠		٤٠,٥٠ \pm ٣,٥٣	
Sex:				
Male	٢٤,٠٠ \pm ٦,٢٤	٠,٠٦١	٤١,٨٠ \pm ٢,٠٤	٠,٩٣٩
Female	٢٣,٣٤ \pm ٥,٥٤	٠,٨٠٦	٤٠,٣٤ \pm ٣,١٠	٠,٣٣٢
Marital status				
Married	٢٤,١٢ \pm ٦,١٩	٠,٠٠٧	٤٠,٣٧ \pm ٣,٥٠	٠,٠٠٣
Single	٢٣,٢٥ \pm ٥,٤٧	٠,٩٣٢	٤٠,٥٦ \pm ٢,٩٣	٠,٩٥٩
Educational level				
Diplome	٢١,٩٢ \pm ٦,٣٤	٠,٨٨٧	٤٠,٦١ \pm ٣,٢٥	٠,٠٤٢
Intermediate education degree	٢٤,١٤ \pm ٥,٠٩	٠,٣٤٦	٤٠,٤٨ \pm ٢,٩٥	٠,٨٣٨
Years of experience in nursing				
< ١٠	٢٣,٧٦ \pm ٦,٣٧	٠,٦٥٦ ٠,٨٨٣	٤١,٣٠ \pm ٢,٠١	٠,٩٨٧ ٠,٨٠٤
١٠ - < ٢٠	٢٣,٧٣ \pm ٥,٣٥		٤٠,٠٠ \pm ٣,٥٢	
٢٠ - < ٣٠	٢٢,١٠ \pm ٥,٦٠		٤٠,٣٠ \pm ٢,٩٤	
≥ ٣٠	٢٥,٥٠ \pm ٠,٧٠		٤٠,٥٠ \pm ٨,٣٦	
Years of experience in oncology department				
< ١٠	٢٤,٠٠ \pm ٦,٠٨	٠,٢٥٩ ٠,٨٧٩	٤١,٥٣ \pm ٢,٢٦	٢,٢٧٥ ٠,٣٢١
١٠ - < ٢٠	٢٣,٢٠ \pm ٥,١٧		٣٩,٧٣ \pm ٣,١٧	
٢٠ - ٣٠	٢٢,٢٠ \pm ٥,٦٥		٤٠,٢٠ \pm ٣,٥٨	

Statistically Significant difference at (P<٠,٠٥)

Table (٦): Correlation between levels of total knowledge and total nurses' practice about nursing care before and after the program

	Total knowledge scores	
	R	P
Total practice scores		
Before	-٠,٠٤٠	٠,٨٠٧
Immediate after program intervention	٠,٠١٢	٠,٩٤٢
One month after program intervention	٠,١٦٦	٠,٣٠٥

Discussion

Metastatic spinal cord compression (MSCC) is one of the most serious complications of cancer. All current cancer patients with a diagnosis of cancer and bone metastases are issued with an alert card detailing the potential symptoms of spinal cord compression and the emergency pathway contacts⁽⁶⁶⁾. Metastatic spinal cord compression (MSCC) remains a challenging oncological emergency and requires effective multidisciplinary management for optimal effects on patients' morbidity and quality of life⁽⁶⁷⁾.

The finding of current study revealed that ages of nurses in this study ranged from (30 - < 40) years old. . These findings were in agreement with **Al Attar W. 2015**⁽⁶⁸⁾ who report that the majority (80%) of nurses in study group are within the age of (31-40), and also supported by **Won Kim H and et al 2019**⁽⁶⁹⁾ who reported that Majority (87,2 %) of respondents belonged to the age group of (26-35) years.

In relation to sex, in the present study it was found that (87,0%) were females and

(12,0%) of them were males .This is in line with **Musleh Band et al 2015**⁽⁷⁰⁾, who reported that (87,3%) of the studied nurses were females and 12,7% were males. This is with disagreement with **Sharour L 2018**⁽⁷¹⁾ who report that 61,8 % were males and 38,2 % were females, and also rejected by **El-Aqoula and et al A 2020**⁽⁷²⁾, who reported that 60,3 % were males and 39,7% were females.

Regarding educational level, the current study revealed that nearly two third (67,0%) of the studied nurses had intermediate educational degree. This is in same line with **Majeed H and Al Attar W 2015**⁽⁷³⁾, who reported that 60% had intermediate educational degree level (Nursing institute). This study is in contrast with **Abdullah D And Rasheed O 2018**⁽⁷⁴⁾, who recorder that 62,0% of the studied nurses had nursing school educational level. This study differs from what was reported by **Admass B, Endalew N, Tawuye H, and Mersha A 2020**⁽⁷⁵⁾ who reported that the majority (83,3%) of participants had a bachelor's degree in nursing. This difference is due to the different setting of data collection (oncology clinics, wards, intensive care units).

Concerning to marital status our study showed that (80%) of the studied nurses were married, (20%) were single, which in line with **Salim N. and et al 2019⁽¹⁷⁾**, who reported that (67%) were married and (33%) were single. Similarly, **Zayed Hand et al 2019⁽¹⁸⁾**, who recorded that more than two thirds of the respondents (70.9%) were married. **Related to years of experience** in oncology department, the current study showed that there was about two third (60%) of the studied nurses had experience in oncology department from < 10 to < 20 years. This is in agreement with **Metwaly E and Hamad A 2019⁽¹⁹⁾**, who reported that (66.7%) of nurses had more than 5 years of experience. This study and its results are against with to what was reported by **Habib A and et al 2018⁽²⁰⁾**, who recorded that the Participant's Experience (48.1%) had from 5 to less than 10 years of experience, and also contradicted with **Germossa Gand et al 2018⁽²¹⁾**, who reported that the participant's experience (67.7%) had from 2-5 years of experience.

Regarding attendance of the studied sample for previous educational program, the current study showed that (100%) of the studied nurses were not attend any educational program before. This is

supported by **Hosen S and et al 2019⁽²²⁾**, who recorded that 72.9% of nurses had not any training. This differ may result because the studied sample in the previous setting had not attend before any educational program about metastatic spinal cord compression and care of their patients.

Concerning to the total nurses' level of knowledge, it was revealed that 92.5% of the studied nurses had low level of knowledge in pre assessment period, while 100% (all of them) had high level of knowledge in the immediate post period, and then decreased to be 87.5% in the post one month assessment period. It was found that there was a highly statistically significant difference as P value= 0.0001. This result is nearly in line with **Elsevier B 2019⁽²³⁾**, who reported that Fifty-seven (57%) of the participants had an unsatisfactory level of knowledge. Most of them had knowledge deficits regarding pathology, Oral mucositis definition, assessment, scoring, treatment, and patient education and advice. These results also in agreement with **b M and et al 2020⁽²⁴⁾**, who reported that there was a significant improvement in knowledge. The post-tests after course completion and again at the 3-month interval showed mean values of 88.28% and 89.30%, respectively (p = .36),

In the current study, there was a highly statistically significant difference between total practice scores in before and immediately after implementing the program and also between the total practice scores in before and after one month period as P value= 0.0001. These result are in agreement with Jihad Sh and Khudur K 2020⁽⁴⁵⁾, who reported that the knowledge and practice scores of participants were inadequate for study group in the pre-test.

The finding of current study revealed that ages of patients in this study ranged from 40 - < 60 years. The findings of the current study are contradicted with Younsi A, and et al 2020⁽⁴⁶⁾, who reported that patient's age ranged from 60-70 years. This study and its results also against with to what was reported by Morgen S and et al 2016⁽⁴⁷⁾, who recorded that the average age of the patients was 60 years old, and it was also not comparable to that reported by Iida K and et al 2018⁽⁴⁸⁾, who recorded a median age ranged from 61 to 64 years old. This is as a result of the researcher commitment of the inclusion criteria regarding the studied patients age.

Regarding the sex of the studied patients, In the present study, it was

revealed that (66.6%) were females and (33.3%) were males, this result is in line with Bellut D and et al 2015⁽⁴⁹⁾ who reported that (66.6%) were females and (33.3%) were males. This study is rejected by Yolu W and Yang Sh 2017⁽⁵⁰⁾ who reported that 66.6% were male and 33.3% were females. This is may be due to most of the studied patients had a diagnosis of breast cancer.

Regarding patient diagnosis, the current study revealed that the most common patient diagnosis was breast (66.6%) followed by prostatic (33.3%), (10%) had Multiple myeloma and 6.6% had other types of cancer, which is supported by Nakata E and et al 2020⁽⁵¹⁾ who reported that patient diagnosis were breast (12 patients, 31.0%), lung (8 patients, 21.0%), prostatic (8 patients, 21.0%), stomach, colorectal and other cancers (10 patients, 26.3%). This study differs from what was reported by MCQUAIL M and et al 2018⁽⁵²⁾, who reported that (33.3%) of studied patients had prostatic and lung cancer and only (16.6%) had breast cancer. This study and its results also against with to what was reported by Shah S and et al 2021⁽⁵³⁾ who reported that lung (33.3%), breast (16.6%), and renal

(١٠,٣%). This difference as a result of increased the females sample in the study.

Regarding patients' physical assessment related to Spinal Cord Independence Measure scale (self-care, respiration and mobility), this study showed that there was a statistical significance difference as P value as P value ٠,٠٠٠١. These findings were in agreement with a study result about "Functional status of patients with metastatic spinal cord compression "reported by **Santos D, Leite I and Guerra M** ٢٠١٨^(٨٢) who reported that there was difference in the functional status ($p = ٠,٠٠٤$) and in the motor domain ($p = ٠,٠٠١$) according to the level of neurological deficits. These findings were also supported by **Fatima N** ٢٠٢٠^(٨٤) who reported that there was significant difference in the ambulatory functional status of the patents through the study as P value ٠,٠٠١.

Conclusion

Based on the findings of the present study, it can be concluded that:

The educational program improved the knowledge and practice score of the studied nurses towards care of cancer patient with Metastatic Spinal Cord Compression.

- Concerning to the bio-sociodemographic characteristics of the studied nurses, it was

noticed that (٣٧,٥%) of the studied nurses ranged from (٣٠ - < ٤٠) years old. Also, it was found that (٨٧,٥%) were females and (١٢,٥%) of them were males. Also, it was found that half (٨٠%) of the studied nurses were married, (٢٠%) were single.

- Concerning to the bio-sociodemographic characteristics of patients, it was noticed that (٦٣,٣%) of the studied patients ranged from (٤٠ - < ٥٠) years old. Also, it was found that (٤٣,٣٣%) were males and (٥٦,٦٦%) of them were females, (٩٠%) were married, (١٠%) were widow.
- It was found that there is a highly significant difference related to the total level of knowledge and practice of studied nurses through periods of study (pre-immediate and post one month assessment periods) with P value= ٠,٠٠٠١.

Recommendations

Based on the findings of the current study, the following recommendations are derived and suggested:

١-Recommendation for patients:

All patients are in need to a simplified illustrated and comprehensive Arabic booklet about spinal cord compression treatment.

٢- Recommendation for nurses:

- In-service educational program should be conducted for oncology nurses to enhance their knowledge and practice toward their cancer patients to reduce complications of metastatic spinal cord compression.

References

- ١- Robson P. Metastatic spinal cord compression: a rare but important complication of cancer. Clin Med Journal of Clinical Medicine (Lond). ٢٠١٤; ١٤(٥): ٥٤٢-٤٥.
- ٢- Bader D., Worsley P. Technologies to monitor the health of loaded skin tissues. ٢٠١٨; ١٧(١): ٤٠.
- ٣- Fisher M., Davies C., Lacy H. Doherty D. Oncology Section EDGE Task Force on cancer: measures of cancer-related fatigue - a systematic review. Rehabil Oncol. ٢٠١٨; ٣٦(٢): ٩٣-١٠٥.
- ٤- Fremmelevholm A. , Soegaard K. Pressure ulcer prevention in hospitals: a successful nurse-led clinical quality improvement intervention. Br J Nurs. ٢٠١٩; ٢٨(٦): ٥٦- ٧٠.
- ٥- Boussios S., Cooke D., Hayward C., Kanellos F., Tsiouris A., Chatziantoniou A., Kyriakou N., Rathansi A. International Journal of Cancer Research and Treatment. ٢٠١٨; ٣٨(٩): ٤٩٨٧-٤٩٩٧.
- ٦- McCurdy M., Shanholtz C. Oncologic emergencies. Crit Care Med. ٢٠١٢; ٤٠(٧): ٢٢١٢-٢٢.
- ٧- Watanabe N., Sugimoto Y., Tanaka M., Mazaki T., Arataki S., Takigawa T., Kataoka M., Kunisada T. , Ozaki T. Neurological recovery after posterior spinal surgery in patients with metastatic epidural spinal cord compression. Acta Med Okayama . ٢٠١٦; ٧٠(٦): ٤٤٩-٥٣.
- ٨- Hoskin P., Misra V., Hopkins K., Holt T., Brown G., Arnott S., Sharon T., Reczko K., Beare S., Lopes A., Forsyth S. SCORAD III: randomized noninferiority phase III trial of single-dose ١٥- Coleman R. The use of bisphosphonates in cancer treatment. ٢٠١١; ١٢١٨(١): ٣-١٤.
- ٩- Jabejdar P., Lo S., Redmond K., Soliman H., Myrehaug S., Husain A., Heyn C., Kapadia A., Chan A., Sahgal A. Spinal metastases: multimodality imaging in diagnosis and stereotactic body radiation therapy planning. Future Oncol ٢٠١٧; ١٣(١): ٧٧-٩١.
- ١٠- Lee A., Dunne M., Small C., Kelly P., McArdle O., O'Sullivan J., Hacking D., Armstrong J., Pomeroy M., Moriarty M., Clayton-Lea A., Parker I., Collins D.,

- Thirion P. (ICORG ٠٥-٠٣): Prospective randomized non-inferiority phase III trial comparing two radiation schedules in malignant spinal cord compression (not proceeding with surgical decompression); the quality of life analysis. *Acta Oncol*, ٢٠١٨; ٨(١١): ١-٨.
- ١١-Roberta K., Karen I. Understanding spinal cord compression. *Lippincott Nursing center Journal*. ٢٠١٩; ٤٦(٩): ٤٤-٥١.
- ١٢- National Institute for Health and Care Excellence. NICE pathways: metastatic spinal cord compression. ٢٠١٩. <https://tinyurl.com/y٤qmbdj٧> (accessed ١٧ September ٢٠٢٠).
- ١٣- Miyoshi Y., Kawahara T., Yao M., Uemura H. Clinical outcome of surgical management for symptomatic metastatic spinal cord compression from prostate cancer. *BMC Urol*. ٢٠٢٠; ٢٠(١): ١٤٣-٥٠.
- ١٤-Surveillance of metastatic spinal in adults: risk cord compression in adults: risk assessment, caused by metastatic tumor." *Clinical Neurosurgery*, ٢٠١٦; ٥٢(٦): ٦٥-٧٠.
- ١٥- Coleman R. The use of bisphosphonates in cancer treatment. ٢٠١٧; ١٢١٨(١): ٣-١٤.
- ١٦-Kassamali H., Ganeshan A., Hoey E., Crow P., Henerson J. Pain management in spinal metastases: the role of percutaneous vertebral augmentation. *Ann Oncol*, ٢٠١١; ٢٢(٤): ٧٨٢-٨٦.
- ١٧-Itagaki M., Talenfeld A., Kwan S., Talenfeld A., Kwan Sh., Brunner j., Mortell K., Brunner M. Percutaneous vertebroplasty, kyphoplasty for pathologic vertebral fractures in the Medicare population: safer and less expensive than open surgery. *J Vasc Interv Radiol*, ٢٠١٢; ٢٣(١١): ١٤٢٣-٢٩.
- ١٨-Bhatt A., Schuler J., Boakye M., Woo Sh. Current and emerging concepts in non- invasive and minimally invasive management of spine metastasis. *Cancer Treat Rev* ٢٠١٣; ٣٩(٢): ١٤٢-٥٢.
- ١٩-Laufer I., Rubin D., Lis E., Cox B., Stubblefield M., Yamada Y., Bilsky M. The NOMS framework: approach to the treatment of spinal metastatic tumors. *Oncologist* ٢٠١٣; ١٨(٦): ٧٤٤-٥١.
- ٢٠-Loblaw D., J. Perry, Chambers A., Laperriere N. Systematic review of the diagnosis and management of malignant extradural spinal cord compression: the Cancer Care Ontario Practice Guidelines Initiative's Neuro-Oncology Disease Site Group. *Journal of Clinical Oncology*, ٢٠١٥; ٢٣(٩): ٢٠٢٨-٣٧.

- 21-Gabriel J. Acute oncological emergencies. Nurs Stand. 2012; 27(4):30-41.
- 22-Patchell A., Tibbs P., Fregin W., .Payne R. Saris S.,JKryscio R., Young B. Direct decompressive surgical resection in the treatment of spinal cord compression caused by metastatic cancer: a randomized trial. Lancet.2010; 376 (9486): 643-8.
- 23-Prasad D., D. Schiff . Malignant spinal-cord compression. Lancet Oncology.2005; 6 (1): 10-24.
- 24-Trok R., Andrewese T. Nursing considerations for supporting cancer patients with metastatic spinal cord compression: a literature review. British Journal of Nursing, 2019;28(17):24-9.
- 25- National Institute for Health and Care Excellence. NICE pathways: metastatic spinal cord compression. 2019. <https://tinyurl.com/y4qmbdj7> (accessed 17 September 2020).
- 26-Spratt D., Beeler W., Moraes F. RhinesL. Gemmete J.,Chaudhary N., Shultz D., Smith S., Berlin A., Dahele M., Slotman B., Younge K., Bilsky M., ParkP., Szerlip N. An integrated multidisciplinary algorithm for the management of spinal metastases: an International Spine Oncology Consortium report. Lancet Oncol. 2017;18(12): 220-30.
- 27-Wänman J, Grabowski P, Nyström H, Gustafsson P., Bergh A., A Widmark A., Crnalic S. Metastatic spinal cord compression as the first sign of malignancy. 2017;18(4):407-12.
- 28-Porth C. Essentials of Pathophysiology: Concepts of Altered Health States. 7rd ed. Philadelphia, PA: Wolters Kluwer Health/ Lippincott Williams and Wilkins; 2011,33-50.
- 29-Lewis Sh., Dirksen Sh., Bucher L. Medical Surgical Nursing (assessment and management of clinical problems).10th ed., John Wiley& Sons, INC company, 2011;1(1):1118-1126.
- 30-Nieder C. Patients with metastatic spinal cord compression profit from rapid multidisciplinary diagnostics and treatment. Strahlenther Onkol. 2019; 190(4):367-78.
- 31-Hinkle J., Cheever K. Medical-surgical nursing. 14th ed, china. Philadelphia com. 2018; 870-77.
- 32- Murakami H., Kawahara N., Demura S., Kato S., Yoshioka K., Sasagawa T. Perioperative complications and prognosis for elderly patients with spinal

- metastases treated by surgical strategy. Orthopedics. 2010; 33(3):160-8.
- 33- Lawton A., Lee K.,Cheville A., Ferrone M.,Rades D.,Balboni T., Abrahm J. Assessment and Management of Patients With Metastatic Spinal Cord Compression: A Multidisciplinary Review . Journal of Clinical Oncology, 2018; 37(1):01-11.
- 34- Tate D., Wheeler T., Lane G.,Forchheimer M., Anderson K., Sorensen F. Recommendations for evaluation of neurogenic bladder and bowel dysfunction after spinal cord injury and/or disease. Journal of spinal cord medicine, 2020; 33(2):141-64.
- 35- Trok R., Andrewese T. Nursing considerations for supporting cancer patients with metastatic spinal cord compression: a literature review. British Journal of Nursing, 2019; 28(17):24-9.
- 36-McClurg D., Lowe-Strong A. Does abdominal massage relieve constipation? Nurs Times. 2011; 107(12):20-26.
- 37-Krassioukov A., Eng J., Claxton G., Sakakibara B., Shum S. Neurogenic bowel management after spinal cord injury: a systematic review of the evidence. Spinal Cord. 2010; 48 (10):718-33.
- 38-Slavin J. Fiber and prebiotics: Mechanisms and health benefits. Nutrients. 2013; 5(4):1417-30.
- 39- Consortium for Spinal Cord Medicine Bladder management for adults with spinal cord injury: a clinical practice guideline for health-care providers. J Spinal Cord Med. 2006; 29(5):527-73.
- 40- Goetz L., Cardenas D., Kennelly M., Bonne Lee B., Linsenmeyer T. Moser C, Pannek J. Wyndaele J., Sorensen F. International Spinal Cord Injury Urinary Tract Infection Basic Data Set. Spinal Cord 2013; 51(9):700-704.
- 41- Sharpe L., Butow P., Smith C., McConnell D., Clarke S. The Relationship between Available Support, Unmet Needs and Caregiver Burden in Patients with Advanced Cancer and their Caretakers. Journal of Psycho-oncology. 2005; 14 (2):102-14.
- 42-Erdogan Z. and Yavuz E. Quality of Life in Caregivers of Cancer Patients. Arch Med Rev J. 2014; 22(2):226-36.
- 43-Ruff R., Adamson V., Ruff S. Wang X. Directed rehabilitation reduces pain and depression while increasing independence and satisfaction with life for patients with paraplegia 2007; 44(1):1-10.

- ٤٤-Kang E., Lee S., Kim H., Min K., Hur G., Shim J., Kang K., Oh S., Seo J., Lee S., Kim J. Prognostic Factors and Skeletal-Related Events in Patients with Small Cell Lung Cancer with Bone Metastases. J Oncology. ٢٠١٦; ٩٠(٢):١-١١.
- ٤٥-Workman L. Medical Surgical Nursing Care, Management of Patients with Problems of the Nervous System. ٧th ed., London: John Wiley and Sons Co, ٢٠١١; ٤١١-١٣.
- ٤٦-Patnaik S., Turner J., Inaparthi P., Kieffer w. Metastatic spinal cord compression. British Journal of Hospital Medicine. ٢٠٢٠; ٨١(٤):١-١٠.
- ٤٧: Yin Q., Wang C, Yu J., and Zhang Q. Quantitative assessment-based nursing intervention improves bowel function in patients with neurogenic bowel dysfunction after spinal cord injury. Medicine (Baltimore). ٢٠٢٠; ٩٩(٥١): ٢٣٣٥٤.
- ٤٨- Shah S, Kutka M, Lees K, AbsonCh, Hadaki M, CookeD, Neill Ch, Sherif M, Karathanasi A, Boussios S. Management of Metastatic Spinal Cord Compression in Secondary Care: A Practice Reflection from Medway Maritime Hospital, Kent, UK. Journal. ٢٠٢١; ١١(٢), ١١٠.
- ٤٩-Dea N, Versteeg A, Sahgal A, Verlaan J, Charest-Morin R, Rhines L, Sciubba D, Schuster J, Weber M, Lazary A., Fehlings M, Clarke M, , Arnold P, Boriani S, Bettgowda H, Laufer, I, Gokaslan Z, Fische Ch. Metastatic Spine Disease: Should Patients With Short Life Expectancy Be Denied Surgical Care? Neurosurgery, ٢٠٢٠; ٨٧(٢), ٣٠٣-١١.
- ٥٠-Nakata E, Sugihara Sh, Sugawara Y, Nakahara R, Furumatsu T, Tetsunaga T, Kunisada T, Nakanishi K, Akezaki Y and Ozaki T. Multidisciplinary treatment system for bone metastases Oncology letters J, ٢٠٢٠; ١٩(٤), ٣١٣٧-١٤٤.
- ٥١- Rodger S. Management of patients with non-traumatic spinal cord injury. Nursing Times, ٢٠١٩; ١١٥: ٣, ٣٤-٣٧.
- ٥٢- Li J., Wei W., Xu F., Wang Y., Liu Y. and Fu Ch. Clinical Therapy of Metastatic Spinal Tumors. The journal Frontiers in Surgery, ٢٠٢١; ٨(١), ١-١٤.
- ٥٣-Catz A., Itzkovich M., Agranov E., Ring H., Tamir A. SCIM-spinal cord independence measure: a new disability scale for patients with spinal cord lesions. ١٩٩٧; ٣٥(١٢): ٨٥٠-٥٦.
- ٥٤- Jensen T and Karoly P. Self-report scales and procedures for assessing pain in adults. In The Handbook of Pain

- Assessment (Turk DC &Melzack R eds). The Guildford Press CO., ١٩٩٢; ١٣٥-٥١
- ٥٥- Beck A., Epstein N., Brown G., Steer R. An inventory for measuring clinical anxiety: Psychometric properties. Journal of Consulting and Clinical Psychology. ١٩٨٨, ٥٦(٦): ٨٩٣-٧.
- ٥٦-Loblaw D., Laperriere N. Mackillop W.A Population based study of malignant spinal cord compression in Ontario. Clin Oncol (R CollRadiol) ٢٠١٣; ١٥(٤):٢١١-٧.
- ٥٧- Macdonald, A., Lynch D., Garbett I. Nazeer N. Malignant spinal cord compression. J. R. Coll. Physicians Edinb. ٢٠١٩;٤٩(٢): ١٥١-٦.
- ٥٨- Al Attar W. Effectiveness of the nursing educational program upon nurse's knowledge and practices concerning chemotherapy precautions. ٢٠١٥;٤(٦):٧-١٣.
- ٥٩- Won Kim H ., Hee Kim D. , Hee Kim Y., Ju Lee E., Yi Kang S. , Bit Lee D ., ji Kim Y. Clinical nurses' awareness and caring experiences for patients with cervical cancer: A qualitative study. ٢٠١٩;١٤(٥):٢١٧-٤٠.
- ٦٠- Musleh B.,Erfan S., Mohammed M. ,AbdElAziz M. Impact of an Educational Program about Cancer Pain Management on Nurses' Knowledge, Attitudes, and Practice at Intensive Care Unit. ٢٠١٥;٣(٦):٤٠-٩.
- ٦١-Sharour L. Improving oncology nurses' knowledge, self-confidence, and self-efficacy in nutritional assessment and counseling for patients with cancer: A quasi-experimental design. ٢٠١٨; ٦٢ (٢٠١٩):١٣١-٤.
- ٦٢-El-Aqoul A., Obaid A., Jarrah I., Al-Rawashdeh K., and Al Hroub A. Effectiveness of Education Program on Nursing Knowledge and Attitude toward Pain Management. ٢٠٢٠; ٧(٤): ٣٨٢-٨.
- ٦٣-Majeed H. , Al Attar W. Effectiveness of an Educational Program on Nurses' Knowledge Concerning Side Effect of Radiotherapy at Al-Amal National Hospital for Cancer Management in Baghdad City. ٢٠١٥;٥(٢):٥١١-٣٧.
- ٦٤-Abdullah D., Rasheed O. Nursing Staff Knowledge regarding Safe Chemotherapy Administration at Oncology Center in Kirkuk City. ٢٠١٨;١٢(١):١٤٤-٥٥.
- ٦٥-Admass B., Endalew N., Tawuye H., Mersha A. Knowledge and Attitude of Ethiopian Oncology Nurses About Cancer Pain Management: National Survey. ٢٠٢٠; ١٢(١): Jordan.

- International Journal of Nursing Sciences. ٢٠١٩; ٦(٣): ٢٨٣-٧.
- ٦٦-Salim N. · Joshua R. AbuBaker N. Chehab F. Jose A. Effect of a Nursing In-Service Education Program on Nurses' Knowledge and Attitudes towards Pain Management in a Governmental Hospital in the United Arab Emirates: Experimental Random Assignment Study. ٢٠١٩; ٢(٤): ١٤٦-٥٣.
- ٦٧-Zayed H., Saied S. , El-Sallamy R. , Shehata W. Knowledge, attitudes and practices of safe handling of cytotoxic drugs among oncology nurses in tanta university hospitals. ٢٠١٩; ٤٣(١): ٧٥-٩٢.
- ٦٨-Metwaly E. and Hamad D. Effect of palliative care program on nurses' performance regarding prostate cancer and patients' outcomes. ٢٠١٩; ١٦(٣): ١٩٥-٢٠٥.
- ٦٩-Habib A., Zein El din Y. , Ibrahim E. Oncology Nurses' Knowledge and Practices Regarding Handling Hazardous Drugs: Developing Procedure Manual For Safe Handling Of Hazardous Drugs. ٢٠١٨; ٧(٢): ١-١١.
- ٧٠-Germossa G., Sjetne I., Helles R. The Impact of an In-service Educational Program on Nurses' Knowledge and Attitudes Regarding Pain Management in an Ethiopian University Hospital. ٢٠١٨; ٦(١): ٢٢٩-٣٥.
- ٧١-Hosen S., Hassan M., Islam S., Raseduzzaman M., Hossain M., Nafiujjaman M., Nishat T , Hasan J. Evaluation of knowledge and practice of handling chemotherapy agents by nurses: ٢٠١٩; ٦(١٠): ٦٩-٧٨.
- ٧٢-Elsevier B.A cross-sectional study on oncology nurses' knowledge and practice of oral mucositis among cancer patients in compression (MSCC) treated with palliative : Surgical timing and survival rate. ٢٠١٧; ١٢(١٢): ١٢٨-٣٣.
- ٧٣-Taj M, Lalani B, Madhani N, Ouma C, Njumwa L, Ukani H, Oluoch M, Sayani S, Zaidi F, Sulaiman Z. Oncology nursing training: A blended teaching approach in resource-limited countries. Journal of Clinical Oncology, ٢٠٢٠; ٣٨(١٥): ١٨٩-٩٩.
- ٧٤- Jihad Sh. , Khudur K. Effectiveness of an Education Program on Nurses' Knowledge and practice toward Radioiodine therapy at Alamal Hospital in Baghdad city. ٢٠٢٠; ٢٤(١): ٦١٥٧-٦٤.
- ٧٥-Younsi A., Riemann L., Scherer M., Unterberg A. , Zweckberger K. Impact of decompressive laminectomy on the functional outcome of patients with metastatic spinal cord compression and

- neurological impairment. 2020; 37(2): 377–90.
- ٧٦-Morgen S., Engelhom S., Larsen C., Sogaard R. , Dahl B. Health-related Quality of Life in Patients with Metastatic Spinal Cord Compression. 2016; 8(3):309–10.
- ٧٧- Iida K., Matsumoto Y., Nokitaka M., Setsu N., Harimaya K., Kawaguchi K., Hayashida M., Okada S., , Nakashima Y. The neurological outcome of radiotherapy versus surgery in patients with metastatic spinal cord compression presenting with myelopathy. 2018; 13(1): 9–12.
- ٧٨-Bellut D., Burkhardt J., Mannion A., Porchet F. Assessment of outcome in patients undergoing surgery for intradural spinal tumor using the multidimensional patient-rated Core Outcome Measures Index and the modified McCormick Scale .2010; 39(2):77–110.
- ٧٩-Yolu W. , Yang Sh. Metastatic spinal cord compression (MSCC) treated with palliative decompression: Surgical timing and survival rate. 2017; 12(12): 128–33.
- ٨٠- Nakata E., Sugihara Sh., Sugawara Y., Nakahara Y., Furumatsu T., Tetsunaga T., Kunisada T., Nakanishi K., Akezaki Y., Ozaki T. Multidisciplinary treatment system for bone metastases for early diagnosis, treatment and prevention of malignant spinal cord compression. 2020; 19(4): 3137–44.
- ٨١-Mcquail M., mrcsi m., McCartney B., baker J., frsci m., Jaadan M., mrsc b., John P. , McCabe J. Management of Metastatic Spinal Cord Compression in Ireland: Are SurgeonsOverlooked. 2018; 12(4): 428–33.
- ٨٢- Shah S., Kutka M. , Lees K., Abson Ch., Hadaki M., Cooke D., Neill Ch., Sheriff M., Karathanasi A. , Boussios S. Management of Metastatic Spinal Cord Compression in Secondary Care: A Practice Reflection from Medway Maritime Hospital, Kent, UK.2021; 11(110):1102–33.
- ٨٣-Santos D. ,Leite I. , Guerra M . Functional status of patients with metastatic spinal cord compression.2018; 23(9):3220–31.
- ٨٤- Fatima N. Predictors of Ambulatory Functional Status Following Decompressive Surgery for Metastatic Spinal Cord Compression.2020; 17(1): 447–814.

Effect of Nursing Intervention on Fatigue for Multiple Sclerosis Patients

**Rasha Awad Abd'Elamgied Salime^١, Donia Atef Ibrahiem Elzehiri^٢, Reda Abdel Salam Ibrahim^٣*

^١Lecturer of Adult Health Care Nursing, Faculty of Nursing, Helwan University, Egypt

^٢Lecturer of Community Health Nursing, Faculty of Nursing, Helwan University, Egypt

^٣Lecturer of Medical Surgical Nursing department, Faculty of Nursing Tanta University

*Corresponding author: rasha_awad@nursing.helwan.edu.eg OR
drrashasalime@gmail.com

Abstract

Background Fatigue is one of the more frequent symptoms of multiple sclerosis and could adversely effect on patients general health status. **Aim:** Evaluate the effect of nursing intervention on fatigue for multiple sclerosis patients. **Design** A quasi-experimental design was utilized. **Setting** The study was carried out in the neurological department) at El Demerdash hospital. **Subjects** A convenience sample of available patients within ٦ months of about ١٤٤ patients involved. **Tools** Three tools were used for data collection; first tool: patients' socio-demographic and health status characteristics; knowledge questionnaire and patient-reported fatigue self-care practices questionnaire second tool: Fatigue Severity Scale. ٣rd tool: Modified Fatigue Impact Scale. **Results:** The multiple sclerosis patients' means \pm SD scores in all knowledge items were improved after fatigue nursing intervention. Also, a highly statistically significant improvement in all items of reported pre and post fatigue intervention practices (p -value $< ٠,٠٠١$). There was a statistically significant strong direct correlation between total scores of pre and post knowledge and reported self-care practices of fatigue nursing interventions ($p < ٠,٠٠١$). Significant improvement in the reported multiple sclerosis patients' fatigue severity scores means level in the post-test than that of the pre-test, $P < ٠,٠٠١$. **Conclusion** Implementation of nursing intervention could improve fatigue and decrease its

severity with improved the patients' knowledge and fatigue nursing intervention reported practices. Also, there was noticed statistically significant strong positive correlation between total scores of pre-and post-knowledge and with total scores of pre- and post-reported practices of fatigue nursing intervention. **Recommendations** Implementation of fatigue nursing intervention for every patient with Multiple sclerosis to equip them with the knowledge essential to undertake fatigue intervention and achieve long-lasting control of fatigue. Conducting health educational programs and campaigns to raise the multiple sclerosis patients' awareness about the disease and fatigue intervention practices.

Keywords Multiple sclerosis, Fatigue & Nursing intervention

Introduction

Multiple sclerosis, a chronic progressive inflammatory degenerative disease of the central nervous system (CNS), where the immune system fights itself (an autoimmune disorder), leading to the destruction of myelin sheaths (demyelination) and axonal damage of the (CNS) causing long-term disability especially among young adult ⁽¹⁾. Recently, the prevalence of MS has been changing dramatically worldwide. Based on the scientific epidemiological studies the global prevalence of MS is estimated to be more than 2.5 million; as well as more than 400,000 patients in the United State of America (USA) are affected ⁽²⁾. As well as requires considerable time and enormous financial resources to achieve the rehabilitation targets. Some studies have reported that the causes of the disease are not exactly known, but there are genetic and environmental factors such as vitamin D deficiency, Epstein-Barr virus, and Herpes virus infections that activate T cells and lead to myelin sheaths ⁽³⁾. There are many types of MS, differing based on the advancement and deterioration of the disease. They include the Relapsing-remitting form multiple sclerosis (RRMS), primary progressive MS (PPMS), secondary progressive MS (SPMS), clinically isolated syndrome, and radiological isolated

syndrome. The McDonald diagnostic criteria state that the diagnosis of MS depends on clinical presentation, imaging, and presence of dissemination in space, as well as time, by either clinical or imaging features to rule out other diagnoses ⁽⁴⁾.

Multiple Sclerosis is mostly diagnosed among patients in their twenty and thirty years old, although it can develop at any age. Also, studies have concluded that the MS symptoms include physical disability, and commonly experience fatigue (70–90%), gait imbalance and weakness (30, 40%), bowel and bladder dysfunction, visual disturbances and optic neuritis symptoms (20, 30%), cognitive dysfunction, sexual dysfunction, pain, and depression; and these symptoms result in a substantial negative impact on health status, limitations in daily activities, restrictions in participation in work life and leisure activities as well as causing different health related problems ⁽⁵⁾. Additionally, fatigue is the greatest usually recounted symptom amongst peoples with MS, upsetting 70–90% of patients. The original mechanisms are unidentified and maybe several: more than 30 primary and secondary pathological fatigue pathways were recognized ^(6,7).

The absolute cause of fatigue in MS is still unidentified, nevertheless, it is hypothesized that MS-related fatigue may result from centrally mediated processes characterized by MS itself, such as demyelination and axonal loss in the CNS or immune actions (Primary fatigue) or from MS-related complications (trigeminal neuralgia, spasms, psychological issues, etc.), musculoskeletal problems (pain, posture, gait anomalies), sleep problems, and medications (Secondary fatigue) that ultimately associated with limited workability and with worse of general health status ^(٨). Fatigue is often harshly restricting a patient's work, family, and social life. Clinically, patients with MS report fatigue as exhaustion, lack of energy, increased sleepiness or worsening of symptoms, and weakness exacerbated by activity and heat ^(٩,١٠).

Fatigue affects MS general health status in multidimensional spheres ^(١١). Fatigue may affect physical and cognitive function, psychosocial state. Several studies have illustrated that the health status is worse in patients with MS as contrasted with healthy controls with a higher prevalence of depression and fatigue. Fatigue is primary the main contributing factor of poor health status of MS patients ^(١١,١٢). Hence, the crucial role of nurse includes the nursing interventions that aim to

both modify and control the patient's illness by supporting patient self-care practices through helping the patient to cope with fatigue symptom ; promoting safe, best function; and supporting a wellness- and modify health related problems. Nurses can suggest behavioral changes such as conditioning programs, exercise, and improved nutrition. Patients can be referred to an occupational therapist, which can teach them about and help them implement energy-conservation techniques ^(٤).

So, nurses can play a valuable role in fatigue nursing intervention by taking the time to assess patients' fatigue and its effects on general health of MS patients, and developing nursing interventions, . Although a variety of nursing intervention options are available for MS-related fatigue, no single option has emerged as the best. Therefore, further research on the treatment and nursing interventions of this symptom in the MS population is needed ^(٥).

Significance of the study

The Multiple sclerosis is a silent disease that begins and affects hearing and speech, ٥٩,٦٧١ the number of MS patients in Egypt in addition to, ٥٩ patients to every ١٠٠,٠٠٠ citizens the disease incidence rate, ٧٥% from the total number of patients females and ٢٦ years the mean age of incidence rate in Egypt ^(١٣). From

the actual clinical observation the fatigue problem affecting about ٨٠٪ of patients with Multiple sclerosis and is considered as one of the most recurrent problems of (MS), and it can affects their general health status. As it can interfere whether the physical state as well psychosocial and cognitive health of MS patients ^(١٤). Therefore, nurses must regularly assess fatigue in their patients with MS. A variety of nursing intervention are available for MS-related fatigue, and patients and their support systems must be made aware that fatigue can be managed ^(١٥,١٦).

Aim of the stud

This study aim to evaluate the effect of nursing intervention on fatigue for multiple sclerosis patients through the following objectives:

- ١- Assess the patients' knowledge about MS and fatigue reported intervention practices.
- ٢- Assess the fatigue severity and its related health problems (physical, cognitive, and psycho-social health status).
- ٣- Plan and implement MS nursing intervention about fatigue based on patients' needs.
- ٤- Evaluate the effectiveness of nursing intervention on fatigue for MS patients.

Research hypothesis

H١: Fatigue nursing intervention has a positive effect on (MS) patient's knowledge and fatigue reported intervention practices.

H٢: Fatigue severity will be modified after implementing fatigue nursing intervention.

H٣: Fatigue nursing intervention will improve general health status (physical, cognitive, and psychological status) of MS patients.

Subjects and methods

Research design

A quasi-experimental research design was utilized to meet the aim of the study.

The setting of the study

This study was conducted at the neurological department (MS Day Care Unit) at El Demerdash hospital affiliated with Ain Shams University. The MS unit is located on the second floor of the neurology department in the internal medicine building which consists of one room with ٨ chairs capacity they work every day from Saturday to Wednesday except on Thursday and Friday of every week from ٩ am to ٥ pm daily.

Sample

A convenience sample of available patients within ٦ months. Based on the flow rate obtained from the MS Day Care Unit

information system within the period of data collection time the total population = ٢٢٥ and according to Solvin's formula for sample size calculation the required sample was ١٤٤ members^(١٧).

$$n = \frac{N}{1 + N(e)^2} = 144 \text{ patients}$$

Where:

- n= Corrected sample size.
- N = Population size.
- e = Margin of error, and e = ٠,٠٥ based on the research condition.

Tools for data collection

Three tools were used for data collection.

First tool: Developed by the researchers after strength review of the relevant literature **National Center for Biotechnology Information (NCBI) & European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS)**^(١٨,١٩). It designed In the Arabic language based on related literature, it was divided into three parts; **Part I** patients' socio-demographic characteristics and health status; asked about as age, gender, education level, marital status, present job, family member no., rooms no., Residence & Monthly family income, duration of MS and the types of MS.

Part II knowledge questionnaire sheet to assess patients' knowledge regarding MS and fatigue it includes ١٠ questions about the definition of MS, signs & symptoms of MS, MS diagnosed, the causes, risky age group, MS complications, meaning of fatigue associated with MS, and types and how the MS patient deal with the feeling of fatigue and exhaustion associated with multiple sclerosis.

Scoring system

Knowledge obtained from studied patients was checked with a model answer and scored as the following: Complete correct answer takes "three", while the incomplete answer takes "two" And a wrong answer or don't know takes "one". The Patients' knowledge total score ٣٠ grads & converted into percentage and construed as follows:

- Good >٧٠% with scores ranged from ٢١-٣٠ marks.
- Fair ٦٠ - ٧٠% with scores ranged from ١٨-٢١ marks.
- Poor < ٦٠% with score ranged from ١-١٧ marks.

Part III Patient-reported fatigue intervention practice questionnaire developed by the researchers after reviewing the relevant literature **National Center for**

Biotechnology Information (NCBI) & Karatepea etal ^(18,20). Used to assess patients' reported practices regarding fatigue nursing intervention. It is composed of 20 items that are divided into four domains; healthy diet, regular resting & sleeping, physical exercises, and things avoided for MS patients.

Scoring system

This part was rated on a three-point rating scale of performance “always” grade three, “sometimes” grade two, “rarely” grade one. The total score of this part was 30 grades. The higher scores indicated higher practice levels. They were categorized as: scores equal to or more than 10 % were considered as satisfactory practice level and scores lower than 10 % were considered as unsatisfactory practice level.

Second tool Fatigue Severity Scale (FSS): standardized scale adopted from **Amtmann, etal** ⁽²¹⁾ It is a self-reported scale & consists of a 9-item scale that measures the severity of fatigue and how much it affects the person's activities and lifestyle in patients with a variety of disorders especially among MS patients. Administration time is less than 5 mins.

Scoring system Answers are scored on a seven-point scale where 1 = strongly disagree and 7 = strongly agree. This means the

minimum score possible is nine and the highest is 63. Higher the score=greater fatigue severity. The more common way of scoring: mean of all the scores with minimum score being 1 and the maximum score being 7. Mean (SD) FSS scores for healthy individuals; 2.3 (0.7). A cut-off score of 4 or more is considered indicative of problematic fatigue.

Third tool Modified Fatigue Impact Scale (MFIS) Adopted from **D'Souza,** ⁽²²⁾, developed by The Consortium of Multiple Sclerosis Research Centers. It is a short version of the 35-items. The MFIS 9 measures fatigue effect on general health status through its effect on cognitive, physical, and psychosocial function considered by some authors to be three important sub-scales in patients with MS. It is a self-administered questionnaire and begins with introductory statements about how fatigue can affect a person's health status. Patients were asked to circle the one number (from a 9-point Likert scoring system) that best indicates how often fatigue has affected them during the past 4 weeks. The scale ascends from ‘never’, ‘rarely’, ‘sometimes’, ‘often’ and ‘almost always’ each scored 1–9, respectively.

Scoring system Items on the MFIS can be aggregated into three sub scales (physical, cognitive, and psycho-social), as well as into a total MFIS score. All items are scaled so that higher scores indicate a greater effect of fatigue on a person's health status. **Physical Sub scale** This scale can range from 0 to 36. It is computed by adding raw scores on the following items: 1+7+7+10+13+14+17+20+21. **Cognitive Sub scale** This scale can range from 0 to 40. It is computed by adding raw scores on the following items: 2+3+5+11+12+15+16+18+19. **Psycho-social Sub scale** This scale can range from 0 to 8. It is computed by adding raw scores on the following items: 6+8. **Total MFIS Score:** The total MFIS score can range from 0 to 84. It is computed by adding scores on the physical, cognitive, and psycho-social sub-scales

II. Operational Design

a- Preparatory phase

This phase comprised reviewing past and currently available literature and the different studies related to fatigue nursing intervention for MS Patients using text, articles, magazines, and the internet to get a clear picture of the research problem and develop the study tools for data collection.

Validity of tools

The study tools were tested for validity through the judgments of 0 experts in Community Health Nursing and Adult Health Nursing (two professors in Community Health Nursing & three professors in Adult Care Health Nursing).

Reliability of the tools

The reliability test for the present study tools was established by using Cronbach's alpha which showed good internal consistency and good reliability as follows: Knowledge part (Cronbach's alpha = 0.980) and practice part = 0.948). Cronbach's alpha scores for the FSS were ranged between 0.8899 and 0.940. MFIS questionnaires the 21 and 0-item have a (Cronbach's alpha coefficient of 0.81 and 0.80), respectively.

Ethical considerations

Ethical approval was obtained from the Scientific, Ethical Committee of Nursing Faculty at Helwan University. Additionally, oral consent form regarding agreement from the participant in the study was taken after explaining the objective of the study to them. As well, they were assured that anonymity and confidentiality guaranteed and the right to withdraw from the study at any time.

b- Pilot study

A pilot study was done on ١٠% of the study sample about ١٤ patients to evaluate tools' clarity, applicability, and feasibility and to estimate the time needed for filling in the tools. The pilot study data were analyzed, and no modifications were done to the study tools. So, those who participated in the pilot study were included in the main study sample.

c- Fieldwork

The study was conducted within ٦ months from the beginning of January to the end of June ٢٠٢١. The researchers started by introducing themselves to the study members through personal and group interviews. The participants were informed about the aim of the study. Each participant was interviewed separately, and the answers were marked by the researchers, about ٢٠-٣٠ minutes was needed to complete the questionnaire.

After that, fatigue nursing intervention was implemented. Then, the initial data were collected from the studied patients. The results were analyzed statistically and manually prepared, and the package was implemented for them based on educational needs. After completion of the fatigue nursing intervention implementation, the

evaluation of the studied members was carried out by using the same research tools. The researchers were presented in MS daycare unit room ٢ days/week, Saturday & Monday from ٩:٠٠ Am to ٢:٠٠pm.

The application of the fatigue nursing intervention was carried out in four phases

Phase I Assessment phase The researchers first introduced themselves and explained the purpose of the study briefly to the MS patients. Every patient was met individually. The MS patients assured that the obtained information will be treated confidentially and used only for the study. The searchers read and explained each item of the study scales in front of the patient and recorded his/her responses to each item.

Phase II Planning phase It involved designing the topics, which were arranged according to the needs of the study participants and the general objective to increase knowledge and practices regarding fatigue with MS; this achieved through the implementing fatigue nursing intervention, this based on analysis of the actual needs in pre assessment by using the pre-test tools. The fatigue nursing intervention booklet was prepared by the researchers, in simple Arabic language. The content of the booklet

included data about: the definition, signs & symptoms of MS, diagnosis, the causes, risky age group, types, complications of MS. Additionally, the definition of fatigue associated with MS, types of fatigue as well as intervention reported practices that includes the following parts; healthy food, regular periods of rest, regular exercises and avoidant all these nursing intervention included to improve fatigue health-related problems among multiple sclerosis patients.

Phase III Implementation phase The fatigue nursing intervention designed by the researchers in simple Arabic language and sessions began with an orientation about the program and its objectives. The researchers arranged a suitable free time for the participants as the researchers were presented in MS day care unit room ٣ days/week, Saturday & Monday from ٩:٠٠ Am to ٣:٠٠pm. Firstly, they introduced themselves to the participant and gave them a brief idea about the intervention topics. Every session took about ٣٠-٤٥ minutes. The total number of members was ١٤٤ the researchers divided them into ٣ groups every group from ٤٥-٥٠ members. Fatigue nursing intervention was applied in one session for every group, covers the theoretical part, and another one session for every group for

practical part. The teaching methods are designed and developed based on their assessment of educational needs and include lectures, group discussions, and role-play to perform healthy protective practices. The media was a booklet, pictures, PowerPoint presentation also, videos on the laptop screen.

Phase IV Evaluation phase It includes a post-test done after ٣ months of the fatigue nursing intervention by using the same formats of the pre-test tools to assess the effect of nursing intervention on fatigue.

III. Administrative Design

The present study was carried out after taking official permission from the faculty of Nursing Dean to the administrator of the neurological department (MS Day Care Unit) at El Demerdash hospital affiliated to Ain Shams University to collect the data. As well, the aim and expected outcomes of the study were explained clearly.

Statistical Design

Data entry and statistical analysis were performed using personal computer software, the statistical package for social sciences (SPSS), version ٢٠. Suitable descriptive statistics were used such as;

frequency, percentage, mean and standard deviation. A Chi-square test was used to detect the relation between the variables. Also, the correlation coefficient (r) test was used to estimate the closeness association between variables. A paired (t) test was used to compare the mean score between both studied variables. The p-value is the probability that an observed difference is due to chance and not a true difference. A significant level value was considered when the p-value ≤ 0.05 and a highly significant level value was considered when p-value ≤ 0.001 , while p-value > 0.05 indicates non-significant results.

Results

Table (1) indicates that 50.1% of the MS patients age ranges from 31-40 years with the mean age 30.83 ± 7.39 and 60.9 % were females. Regarding their marital status, 58.3% were married, 23.6% single, and 12.0% were divorced. As well as 34.0% had secondary and university educated. Also, 18.1% were housewife, 16.7% were an employee and only 0.6% were retired. As well as 54.9% of them their place of

Figure (1) Presents that there was a marked improvement among MS patients' total score of knowledge pre and post fatigue nursing

residence was the urban. Concerning the crowding index, 68.8% of MS patients had one to two members per room, 50.0% of their family income was enough for only necessities. Relating the disease duration 49.3% had MS for 2-5 years with mean years \pm SD 2.8 ± 2.0 and 63.2% of the studied patients had Relapsing-Remitting MS type.

According to the study hypothesis which confirmed MS patient's knowledge, fatigue intervention reported practices will be improved after implementation of nursing intervention; it will be discussed through the following parts of study results; tables (2,3,4,5,6) and figures (1&2).

Table (2) Illuminates that in the pre-test the huge margin of the MS patients' means \pm SD in all knowledge items was very low which shown that they did not have any knowledge about MS and fatigue nursing intervention. After implementing nursing intervention, there were highly statistically significant improvements were observed in the MS patients' mean scores in all tested items of knowledge ($P < 0.000$)

intervention. As well as the figure shows that 44.3% of the MS patients had poor knowledge pre- fatigue nursing intervention,

while 81,9% of them had good knowledge

Table (3) Refines that there were a highly statistically significant improvement in all items of pre and post-reported intervention reported practices of fatigue nursing intervention (p-value = 0,000).

Figure (2) Describes that there was an obvious improvement among MS patients' total score of reported practices pre and post fatigue nursing intervention. As well as the figure shows that 91,9 % of the MS patients had unsatisfactory reported practices pre-fatigue nursing intervention , while 93,0% of them had satisfactorily reported practices post fatigue nursing intervention.

Table (4) Discloses that there were noticed statistically significant strong positive

after the fatigue nursing intervention.

correlation between total scores of knowledge and total scores of reported pre and post fatigue nursing intervention($p < 0,001$).

Table (5) shows statistically significant improvement in the reported MS patients' FSS means scores in the post-test than that of the pre-test, $P < 0,001$.

Table (6) Confirms statistically significant improvement in the reported MS patients' MFIS means scores in all items in the post-test than that of the pre-fatigue nursing intervention, $P < 0,001$.

Table (١) Frequency Distribution of Multiple Sclerosis patients' Socio-demographic Characteristics & Health Status (No. = ١٤٤)

Characteristics	No. (%)	Characteristics	No. (%)
Age		Place of residence	
- ≤ ٢٠	١٠ (٦,٩)	- Rural	٦٥ (٤٥,١)
- ٢١-٣٠	٥٢ (٣٦,١)	- Urban	٧٩ (٥٤,٩)
- ٣١-٤٠	٧٢ (٥٠,١)	Crowding index	
- ≥ ٤١	١٠ (٦,٩)	- < ١	١٥ (١٠,٤)
Mean ± SD	٣٠,٨٣ ± ٧,٠٣٩	- ١-٢	٩٩ (٦٨,٨)
Sex		- ≥ ٣	٣٠ (٢٠,٨)
- Male	٦٢ (٤٣,١)	Family income	
- Female	٨٢ (٦٥,٩)	- Not enough	٦٠ (٤١,٧)
Marital status		- Enough only necessities	٧٢ (٥٠,٠)
- Single	٣٤ (٢٣,٦)	- Enough and saved	١٢ (٨,٣)
- Married	٨٤ (٥٨,٣)	Disease duration	
- Divorced	١٨ (١٢,٥)	- ≤ ١ Year	٦٠ (٤١,٧)
- Widow	٨ (٥,٦)	- ٢-٥ Years	٧١ (٤٩,٣)
Educational level		- ٦-١٠ Years	١٣ (٩,٠)
- Primary	٤٤ (٣٠,٦)	Mean ± SD	٢,٨ ± ٢,٠
- Preparatory	٣٢ (٢٢,٢)	Multiple Sclerosis type	
- Secondary	٣٤ (٣٤,٠)	- Relapsing Remitting MS	٩١ (٦٣,٢)
- University	٣٤ (٣٤,٠)	- Primary Progressive MS	٤١ (٢٨,٥)
Occupation		- Secondary Progressive MS	١٢ (٨,٣)
- Not worked	١٨ (١٢,٥)		
- Student	٢٠ (١٣,٩)		
- Housewife	٢٦ (١٨,١)		
- Worker	١٠ (٦,٩)		
- Free work	٢٣ (١٦,٠)		
- Handwork	١٥ (١٠,٤)		
- Employee	٢٤ (١٦,٧)		
- Retired (early)	٨ (٥,٦)		

Table (٢) Mean Scores and Standard Deviation for MS Patients' Knowledge about MS and Fatigue Pre, and Post- Nursing intervention (No. = ١٤٤).

Knowledge Items	Pre - nursing intervention Mean \pm SD	Post -nursing intervention Mean \pm SD	Paired t. test	P-value
Meaning of Multiple sclerosis	١,٢٣ \pm ٠,٣١	٢,٧٥ \pm ٠,٥٨	٢٣,٢٧٣	٠,٠٠٠**
Causes of Multiple sclerosis	١,٢٧ \pm ٠,٥٦	٢,٣٦ \pm ٠,٧٦	١٣,٥٦٩	٠,٠٠٠**
Types of Multiple sclerosis	١,٢٢ \pm ٠,٥٦	٢,٧٦ \pm ٠,٥٧	٢٣,٢٣٧	٠,٠٠٠**
Age of MS onset	١,١٧ \pm ٠,٥٠	٢,٧٣ \pm ٠,٦١	٢٢,٤٩٨	٠,٠٠٠**
MS manifestation	١,١٨ \pm ٠,٥١	٢,٧٤ \pm ٠,٦٠	١٦,٩٧٠	٠,٠٠٠**
MS diagnosis	١,٢٠ \pm ٠,٥٤	٢,٧٤ \pm ٠,٥٩	٢٣,٣٢٩	٠,٠٠٠**
Most common recurrent symptoms	١,٢٢ \pm ٠,٥٥	٢,٤٧ \pm ٠,٧٢	١٧,٢٩١	٠,٠٠٠**
Complication of MS	١,٢١ \pm ٠,٥٤	٢,٤٣ \pm ٠,٦٥	١٩,٠٦٦	٠,٠٠٠**
Concept of fatigue	١,٢١ \pm ٠,٥٤	٢,٥١ \pm ٠,٦٦	٢٠,١٦٠	٠,٠٠٠**
Nursing intervention of fatigue	١,١٨ \pm ٠,٥١	٢/٦٣ \pm ٠,٧١	٢٣,٣٢٩	٠,٠٠٠**
Total Scores= ٣٠ degree	١٢,١١ \pm ٤,٩٢	٢٦,١٣ \pm ٥,٥٩	٢٢,٧٣	٠,٠٠٠**

**Highly statistically significant at $p \leq 0,001$

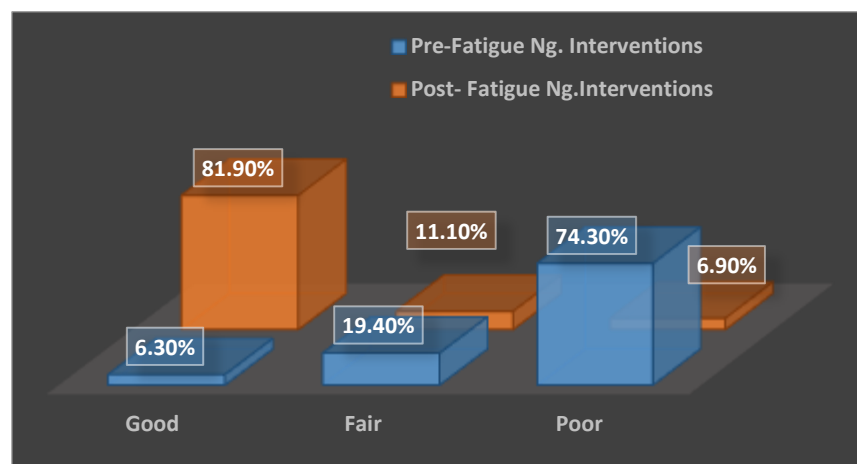
Figure (١) Distribution of Total Scores of MS Patients' Knowledge Pre, and Post- Nursing intervention (No. = ١٤٤).

Table (٣) Mean Scores and Standard Deviations of MS Patients' Reported Fatigue Practice Items Pre & Post -Fatigue Nursing intervention (No. = ١٤٤).

Fatigue Reported Practices	Pre- Intervention Mean ± SD	Post- Intervention Mean ± SD	Paired t. test	P-value
a-Healthy food				
- Drink adequate amount of water ٢ liters	١,٤١±٠,٧١	٢,٣٨±٠,٧٨	٩,٩٧٥	٠,٠٠٠**
- Use oil obtained from plants and fish	١,٣٦±٠,٦٨	٢,٠٩±٠,٨٣	٨,٠١٥	٠,٠٠٠**
- Drink cinnamon tea, ginger every day	١,٣٦±٠,٧٠	٢,٢٣±٠,٨١	٩,٢٦٣	٠,٠٠٠**
- Drink fresh juices	١,٣١±٠,٦٧	٢,٣١±٠,٧٧	١١,٥٦٣	٠,٠٠٠**
- Avoids cola, Alcohol, cafe	١,٤٦±٠,٦٧	٢,٣٠±٠,٧٩	٩,٣٠٧	٠,٠٠٠**
- Eats ٦ meals instead of ٣	١,٥٦±٠,٨٤	٢,١٧±٠,٧٦	٦,٠٣٤	٠,٠٠٠**
- Eat healthy food free from fats	١,٥٥±٠,٨٣	٢,٣٥±٠,٨٤	٧,٥٤٨	٠,٠٠٠**
- Eats a lot of vegetables and fruits	١,٢٨±٠,٦٢	٢,٣٥±٠,٨٤	١١,٤٦١	٠,٠٠٠**
- Eats foods rich in vit. B	١,٣١±٠,٦٥	٢,٣٨±٠,٧٦	١٢,٢٦٩	٠,٠٠٠**
Eats foods rich in omega ٣	١,٢٧±٠,٥٩	٢,٣٢±٠,٧٨	١٢,٣٨٦	٠,٠٠٠**
b- Regular periods of rest and sleeping				
- Take adequate rest period during the day	١,٢٨±٠,٦٢	٢,٤٨±٠,٧٣	١٦,٠١٤	٠,٠٠٠**
- Sleep and get up early at a fixed time every day	١,٣٣±٠,٦٦	٢,٤٩±٠,٦٣	١٥,٠٦١	٠,٠٠٠**
- Sleep ٨ hrs. daily	١,٣٥±٠,٦٧	٢,٤٨±٠,٦٥	١٥,٢٧١	٠,٠٠٠**
- Go to sleep and rest when feeling tired	١,٢٧±٠,٥٩	٢,٦٨±٠,٧٠	١٩,٠٤٥	٠,٠٠٠**
- Take a warm shower before going to sleep	١,٢٥±٠,٩٥	٢,٥٦±٠,٦٧	١٢,٨٥٤	٠,٠٠٠**
- Distribute activities throughout the day	١,٣٦±٠,٧١	٢,٣٨±٠,٨٤	١٠,٨٣١	٠,٠٠٠**
- Go away from anything that triggers angry	١,٢٧±٠,٦٢	٢,٢٦±٠,٧٠	١٢,٥٠٩	٠,٠٠٠**
- Plan activities and ask for help when need	١,٣١±٠,٦٦	٢,٦٣±٠,٦٣	١٨,٣٤٤	٠,٠٠٠**
c- Regular exercises				
- Perform simple exercises as walking ٣٠ min daily	١,٣٣±٠,٦٧	٢,٦٥±٠,٦٤	١٥,٠٩٦	٠,٠٠٠**
- perform exercises to strengthen the muscles	١,٣١±٠,٦٨	٢,٥٨±٠,٦٦	١٥,٤٩٩	٠,٠٠٠**
d- Avoidant				
- Avoids sugar and fats, chocolates	١,٢٦±٠,٦٢	٢,٤٨±٠,٦٩	١٥,٦٩٤	٠,٠٠٠**
- Avoids milk products	١,٢٩±٠,٦٤	٢,٢٩±٠,٩٤	١١,٣٤٥	٠,٠٠٠**
- Avoids smoking	١,٢٩±٠,٦٥	٢,٤٩±٠,٦٨	١٥,٧٩٣	٠,٠٠٠**
- Avoids salts	١,٣٤±٠,٧١	٢,٥٦±٠,٦٨	١٣,٩٤٨	٠,٠٠٠**

- Avoids sun exposure	١,٣١±٠,٦٨	٢,٧٨±٠,٦٦	١٨,١١١	٠,٠٠٠**
Total score of reported practice	٣٠,٨٣±١٠,٥١	٦٠,٥٢±٩,٦٣	٢٣,٧١٠	٠,٠٠٠**

** Highly statistically significant at p-value <٠,٠٠١

Figure (٢) Distribution of Total Scores of MS Patients' Self-care Reported practices Pre, and Post-Fatigue Nursing intervention (No. = ١٤٤).

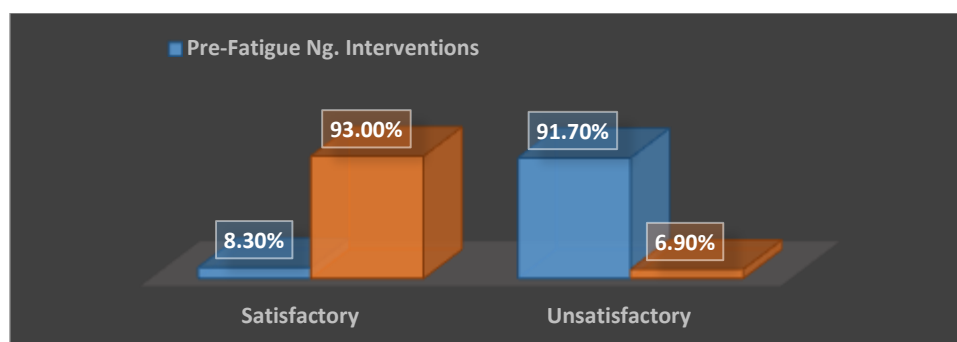


Table (٤) Correlation between MS Patients' Total Scores of Knowledge and Reported Practice Items Pre and Post Fatigue Nursing intervention (No. = ١٤٤).

Items	Total scores of knowledge			
	Pre- Ng. Intervention		Post- Ng. Intervention	
	r	P-value	r	P-value
Reported Practices	٠,٦٦٧	٠,٠٠٠**	٠,٧٠٨	٠,٠٠٠**

*Correlation is significant at ٠,٠٠١

Table (٥) Mean Scores of Fatigue Severity Scale (FSS) of MS Patients Pre- and Post-Fatigue Nursing intervention (No. = ١٤٤)

Total FSS	Mean \pm SD	Minimum / Maximum	Paired t. test	P-Value
Pre- Ng. intervention	٤٧,١٧ \pm ١١,١٤	٢٢-٦٣	٢٢,٣٤٨	٠,٠٠٠**
Post- Ng. intervention	٢٢,٨٣ \pm ٩,٢٣	١٠-٤٥		

** Highly statistically significant at p-value <٠,٠٠١

Table (٦) Mean Scores and Standard Deviations of Modified Fatigue Impact Scale on MS Patients Health Status Pre and Post Fatigue Nursing intervention (No. = ١٤٤)

MFIS items	Pre- Ng. intervention n Mean \pm SD	Post- Ng. intervention Mean \pm SD	Minimum / Maximum	Paired t. test	P-Value
-Physical Subscales ٠-٣٦ *٩Q Questions (٤+٦+٧+١٠+١٣+١٤+١٧+٢٠+٢١)	٢٨,٣٨ \pm ٥,١٩	١٥,٢٣ \pm ٦,١	٩-٣٦* ٣-٣٥**	١٩,٢٩١	٠,٠٠٠* *
-Cognitive Subscale ٠-٤٠ *١٠Q Questions (١+٢+٣+١١+١٢+١٥+١٦+١٨+١٩)	٣٢,٠٤ \pm ٦,٢٧	١٦,٧٦ \pm ٧,٠١	١٠-٤٠* ٣-٣٩**	١٨,٦١٩	٠,٠٠٠* *
-Psychosocial subscale ٠-٨*٢Q Questions ٨+٩	٦,٢٧ \pm ١,١٧	٣,٩٨ \pm ١,٥٦	٢-٨* ٢-٨**	١٢-٤٦٩	٠,٠٠٠* *
Total MFIS = ٨٤*٢١Q	٦٦,٦٩ \pm ١٢,٣١	٣٦,٢٨ \pm ١٣,٧١	٢١-٨٤* ٩-٨١**	١٨,٩٩٠	٠,٠٠٠* *

*pre- Ng. intervention, ** post- Ng. intervention
value <٠,٠٠١

** highly statistically significant at p

Discussion

Fatigue-related to Multiple Sclerosis (MS) is believed as a multidimensional symptom, manifesting in several aspects such as physical, cognitive, and psychosocial fatigue^(٢٢). So, the present study aims to assess the effect of nursing intervention on fatigue for multiple sclerosis (MS) patients.

Part I Socio-demographic characteristics and health status of MS patients:

The finding of the present studied patients showed that the mean age was 30.83 ± 7.39 and more than two-thirds of the studied patients was female. Regarding their educational level, more than one-third of the studied patients were secondary and university educated. As well as more than half of the study sample were married and nearly one-quarter of them were divorced. Around one-quarter of the patients were housewives. More than half their place of residence was urban and more than two-thirds there had one to two family members in one room. Half reported that their income was enough only necessities. As well as about half of the study sample with MS disease duration from 2-5 years & more than one-third of them had Relapsing Remitting (RRMS) type.

This finding was supported by *Beckerman, Eijssen & Ierhulsdonck* (٢٠٢٠)^(٢٣), whose title about “Fatigue Profiles in Patients with Multiple Sclerosis” their study was based on

the severity of fatigue and not on dimensions of fatigue. Reported that the age range 19-68 yrs. of participants with primary MS-related fatigue and ٧٥% were women. Another agreement with *Hussein, et al* (٢٠١٩)^(٢٤), whose title about “Demographic, clinical and Para-clinical characteristics of a sample of Egyptian MS patients attending MS clinic in Al-Azhar University Hospitals”. Reported that the same results as the mean age of onset in men were 29.13 ± 8.99 and in females was 28.13 ± 8.27 . As regards the mean age of patients in the current study, it was 32.09 ± 9.41 years old and the mean age of onset of disease was 28.42 ± 8.48 years old with the peak age of onset between 18-40 years old (84.3%). As well as the study results agreed with *Schiess, et al* (٢٠١٩)^(٢٥), whose title about “Characteristics of a cohort of MS patients in Abu Dhabi: how like the west? Multiple Sclerosis and Related Disorders”. Reported that the study included 100 multiple sclerosis patients showed that male: female ratio was 1: 2,70.

Regarding marital status the finding was supported by *D'hooghe* (٢٠١٨)^(٢٦) Whose title about “Improving fatigue in multiple sclerosis by smartphone-supported energy nursing intervention: The MS Tele Coach feasibility study”. Reported that by study Seventy-five were RRMS patients were recruited from 16 centers in Belgium, found

that about one-third of participants were married or living with a partner & about 10 of the other half were divorced.

On the same way the study by **Kapucu,AKKUŞ,&AKDEMİR(2019)** ⁽²⁶⁾ whose title about “Knowledge of Patients with Multiple Sclerosis About Their Disease and Prevention of Complications” were done on 110 Turkish MS patients revealed that, female more than male in the study, more than half of the sample were married, graduated from high school/university currently unemployed and had a disorder duration of 1-5 years. As well as this result supported by **Zakaria,etal(2017)** ⁽²⁷⁾, whose title about “Clinical characteristics of patients with multiple sclerosis enrolled in a new registry in Egypt, reported that MS was more common among females in Egypt, with RRMS being the most common presentation. These similarities between the research from the researchers’ points of view confirm the same MS disease-related characteristic features although different settings and countries. As well confirms the literature review that MS is about two to three times more common in women than men.

Part II Effect of Fatigue Nursing Interventions in Modification of MS patients’ knowledge:

As regarding the MS patient’s knowledge pre, and post- fatigue nursing intervention, the

current study indicated that in the pre-test the huge margin of the MS patients’ mean scores in all knowledge items were very low which shown that they did not have any knowledge about MS and fatigue nursing intervention. After implementing nursing intervention, there were highly statistically significant improvements were observed in the MS patients’ mean scores in all tested items of knowledge. This result contradicted with **Kapucu,AKKUŞ & AKDEMİR(2019)** ⁽²⁶⁾, the study which reported that nearly most of the study sample had adequate information about the disease, and more than three-quarters of them identified disease progression and prognosis.

Also, the results came in agreement with **Abolfazli(2014)** ⁽²⁸⁾, who conducted a study about “Knowledge and attitude assessment of Iranian multiple sclerosis patients receiving interferon beta” in Tehran and found that the mean calculated knowledge score was 30.9 ± 17.0 . These similarities and differences from the researchers’ point of view postulate the success of the fatigue nursing interventions. Therefore, extensive educational nursing intervention and programs should be implemented to raise awareness of these diseases, thus contributing to the efficient nursing intervention of MS and reducing the associated fatigue.

Part III Effect of nursing intervention on Fatigue for MS patients' Practices:

As regarding the MS patient's nursing intervention reported practices pre, and post-fatigue nursing intervention, the current study indicates that there was a highly statistically significant improvement in all items of reported pre and post fatigue nursing intervention practices. This result contradicted (٢٧), whose title about "Effects of multidisciplinary rehabilitation on chronic fatigue in MS: A Randomized Controlled Trial", revealed that Multidisciplinary fatigue rehabilitation was not more effective in terms of reducing nursing intervention reported fatigue practices in MS patients. This contradiction from the researchers' clinical experiences may have arisen from the difference in cultural conditions, field of education, and level of education of the patients. As well as this could ensure the success of the nursing intervention on the improvement of MS patients' reported practices about fatigue. Since most MS patients are in the age of adolescence and youth, habituation of adequate nursing intervention practices would be more convenient than in the case of other chronic diseases that emerge later in life.

On the same way the study by *khan,et al.*, (٢٠١٤) (٢٨) who reported that the amount of organized fatigue nursing intervention

programs for patients with MS looked effective in reducing fatigue and its related problems.

This part verified the research hypothesis **H₁**, which stated that Fatigue nursing intervention have a positive effect on (MS) patient's knowledge and reported practices regarding fatigue nursing intervention.

As regarding FSS of MS Patients Pre- and Post-Fatigue Nursing intervention the current study shows that statistically significant improvement in the reported MS patients' FSS scores means level in the post-test than that of the pretest. This finding was supported by, *Mirhosseini et al.*, (٢٠١٩) (٢٩), whose title about "The Effect of Benson Relaxation Technique on the Fatigue Severity of Patients with MS in Iran", The study findings suggested that Benson relaxation technique significantly reduced the mean FSS of fatigue and its effect on overall activity using MFIS improved, mood, walking ability, normal work, communicating with others, and life enjoyment in patients with MS.

While the results contradicted by *Rietberg et al.*, (٢٠٢٠) (٣٠), who revealed that the primary outcome measure overall score showed no significant differences between groups at ١٢ weeks and ٢٤ weeks follow-up, nor for sub-scales. This could postulate the vital role of nursing intervention that could improve MS

patient knowledge, as well as a self-care practice about fatigue, and confirmed its effectiveness in reducing fatigue severity among patients with MS.

As regarding mean scores and standard deviations of modified fatigue impact scale on MS patient's related health problem pre and post fatigue nursing intervention the present study revealed that statistically significant improvement in the reported MS patients' MFIS scores means level in its all items in the post-test than that of the pre-fatigue nursing intervention. This finding was fixed by, **Rooney et al.**, (٢٠١٩) ^(٢٧), whose title about "Minimally important difference of the Fatigue Severity Scale and Modified Fatigue Impact Scale in people with Multiple Sclerosis", who concluded that, a difference of the FSS & on the MFIS pre and post the fatigue rehabilitation program establishes a clinically significant difference in fatigue. Therefore, these appraisals represent a threshold value that can be used to interpret changes in the FSS and MFIS over time or in response to an intervention. On the opposite side, these results contradicted with **Rietberg et al.**, (٢٠٢٠) ^(٢٨). Study which reported that fatigue was quite invariant from baseline onwards, irrespective of the type of therapy applied. No differences were found not only on the primary outcome but also on two other

nursing intervention fatigue questionnaires, the FSS, and the MFIS.

This part confirmed the research hypothesis **H_١ & H_٢** which listed that Fatigue severity modified after nursing interventions as well as fatigue nursing intervention improved the physical, cognitive, and psychological status of MS patients.

Conclusion

Based on the results of the present study, it was concluded that implementation of fatigue nursing intervention could improve health-related problems associated with fatigue and decrease fatigue severity with improved the MS patients' knowledge and nursing intervention reported practices. Also, there were noticed statistically significant strong positive correlation between total scores of pre-and post-knowledge and with total scores of pre-and post-reported nursing intervention practices of fatigue nursing intervention. So, the research hypotheses were supported.

The study recommended that

- Implementation of fatigue nursing intervention for every patient with Multiple sclerosis to equip them with the knowledge essential to enable them to undertake fatigue nursing intervention and achieve long-lasting remission of the disease.
- Conducting health educational programs to raise the multiple

sclerosis patients' awareness about the disease and fatigue nursing intervention practices.

- Replication of this study on a large probability sample to achieve more generalization.

References

١. Alqwaifly, M., Alsuhaibani, A., Alharbi, S., Asim Alshowaiman , Omar Alluhayyan , Khaled Almutawwaa: The quality of life in patients with multiple sclerosis in Qassim; International Journal of Medicine in Developing Countries; ٢٠٢٠. ٤(١٢): ٢٠٥٠-٢٠٥٥. <https://doi.org/10.24911/IJMDC.01-1098309967>.
٢. Hartung, D.M.: Economics and Cost-Effectiveness of Multiple Sclerosis Therapies in the USA. Neurotherapeutics ; ٢٠١٧, ١٤, ١٠١٨-١٠٢٦. <https://doi.org/10.1007/s13311-017-0566-3>
٣. Rietberg MB, van Wegen EEH, Eyssen ICJM, Kwakkel G. The MS study group Effects of Multidisciplinary Rehabilitation on Chronic Fatigue in Multiple Sclerosis: A Randomized Controlled Trial. ٢٠٢٠; PLoS ONE ١٥(٩): e٠٢٧٧١٠. <https://doi.org/10.1371/journal.pone.027٧١٠>
٤. Johansson S., Skjerbæk J.C, Michael N . Associations between fatigue impact and lifestyle factors in people with multiple sclerosis – The Danish MS hospitals rehabilitation study, Multiple sclerosis and Related Disorders: ٢٠٢١, available at; DOI: <https://doi.org/10.1016/j.msard.2021.102799>
٥. Razazian, N., Kazeminia, M., Moayed, H., Daneshkhah, A., Shohaimi, S., Mohammadi, M., Jalali, R., & Salari, N.: The impact of physical exercise on the fatigue symptoms in patients with multiple sclerosis: a systematic review and meta-analysis. *BMC Neurology*, ٢٠٢٠; ٢٠.
٦. D'hooghe M. , Gassenb G.V., Daphne K.K, Bouquiauxd O., Cambrone M. , Decoof D. , Lysandropoulosg D., Wijmeerschh B. , Willekensi B. , PennerjI.,K., , Nagelsa G.,: Improving fatigue in multiple sclerosis by smartphone-supported energy nursing intervention: The MS Tele-Coach feasibility study, Published by Elsevier B.V. This is an open-access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Multiple Sclerosis and Related Disorders journal: ٢٠١٨, ٢٢: ٩٠-٩٦.
٧. Manjaly Z, Harrison N.A., Critchley, H. D. et al.: Pathophysiological and

- cognitive mechanisms of fatigue in multiple sclerosis J. Neurol. Neurosurg. Psychiatry, ٢٠١٩, ٩٠ (٦) , pp. ٦٤٢-٦٥١
٨. Nagaraj, K., Taly, A. B., Gupta, A., Prasad, C., & Christopher, R.: Prevalence of fatigue in patients with multiple sclerosis and its effect on the quality of life. Journal of neurosciences in rural practice, ٢٠١٧, ٤(٣), ٢٧٨-٢٨٢. <https://doi.org/10.4103/0976-3147.118774>
 ٩. Khan, F., Amatya, B., & Galea, M.: Nursing intervention of fatigue in persons with multiple sclerosis. Frontiers in neurology, ٢٠١٩, ٥, ١٧٧. <https://doi.org/10.3389/fneur.2019.00177>
 ١٠. Johnson, C. M., MSN, RN, CNL, CNRN : Managing fatigue in patients with multiple sclerosis, Nursing: ٢٠٢٠, June - ٤٢ (٦):٢٦-٢٩ doi: 10.1097/01.NURSE.0000٤١٣٦1٤.29.٦٠.٤.
 ١١. Kotterba, S., Neusser, T., Norenberg, C. *et al.* (). Sleep quality, daytime sleepiness, fatigue, and quality of life in patients with multiple sclerosis treated with interferon beta-١b: results from a prospective observational cohort study. *BMC Neurol* , ٢٠١٨, ١٢٣ <https://doi.org/10.1186/s12967-018-018٣-٥>
 ١٢. Miller, A., Dishon, S.: Health-related quality of life in multiple sclerosis: the impact of disability, gender and employment status. *Qual Life Res*, ٢٠١٨, ١٥: ٢٥٩-٢٧١.
 ١٣. Hassan M.,A., Fatigue in A sample of Egyptian Multiple Sclerosis Patients: A Cross Sectional Study *International Journal of Medical Arts* ٢٠٢١; ٣ [٣] July-September: ١٦٨١-١٦٨٨
 ١٤. Hamdy SM, Abdel-Naseer M, Shalaby NM, Elmazny AN, Nemr AA, Hassan A, Hegazy MI, Mourad HS, Kishk NA, Nada MA, Abdelalim A, Fouad AM, Shehata HS : Characteristics and predictors of progression in an Egyptian multiple sclerosis cohort: a multicenter registry study. *Neuropsychiatr Dis Treat.*; ٢٠١٧;١٣:١٨٩٥-١٩٠٣ [https://doi.org/10.2147/NDT.S14.0869](https://doi.org/10.21٤٧/NDT.S1٤.0٨٦٩)
 ١٥. Kooshiar, H., Moshtagh, M., Sardar, M.A., Foroughipour, M., Shakeri, M., & Vahdatinia, B. Fatigue and quality of life of women with multiple sclerosis: a randomized controlled clinical trial. *The Journal of sports medicine and physical fitness*, ٢٠١٥, ٥٥ ٦, ٦٦٨-٧٤.
 ١٦. Gil-González, I., Martín-Rodríguez, A., and Conrad, and R., et al.: Quality of life in adults with multiple sclerosis: a

- systematic review, ٢٠١٢٤٩. doi: ١٠.١١٣٦/bmjopen-٢٠٢٠-٢٠١٢٤٩.
١٧. Yamane T.: Elementary sampling theory, statistics introductory analysis, ٢nd edition, published by Harper & Row, ١٩٦٧: available online on https://www.google.com/search?q=solving+equation+for+sample+size+calculation+pdf&safe=strict&sxsrf=ALeKk٠٣YjflITdfRDvCd_QhObyz-
١٨. National Center for Biotechnology Information (NCBI). Fatigue in Multiple Sclerosis: Mechanisms, Evaluation, and Treatment. T Braley, R Chervin. Published ٠١ August ٢٠١٧. Accessed October. www.ncbi.nlm.nih.gov/pmc/articles/PMC٢٩١٠٤٦٥/.
١٩. European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) Online Library. Acupuncture for patients with multiple sclerosis-associated fatigues – a randomized controlled trial. Published ٢٧ October, ٢٠١٧, Accessed May ٢٠٢١. Online library.ectrims-congress.eu/ectrims/٢٠٢١/ACTRIMSSECT RIMS٢٠٢١/judith.bellmann-strobl.acupuncture.for.patients.with.multiple.sclerosis.html.
٢٠. Karatepea, K.A., Kayaa,T., Gu'naydina,R., Demirhana, A., Plnar C, eb and Muhtesem Gedizliog , ~ lub.: Quality of life in patients with multiple sclerosis: the impact of depression, fatigue, and disability. International Journal of rehabilitation research, ٢٠٢٠. Accessed May ٢٠٢١. At: <https://www.researchgate.net/publication/٥١٦٧٣٤٠٠>.
٢١. Amtmann, D., Bamer, A.M., Noonan, V., Lang, N., Kim, J., Cook, K.F (). Comparison of the psychometric properties of two fatigue scales in multiple sclerosis. Rehabilitation Psychology, ٢٠١٢, ٥٧, ١٥٩-١٦٦.
٢٢. D'Souza, E., : Modified Fatigue Impact Scale - ٥-item version (MFIS-٥). Occupational medicine (Oxford, England). ٢٠١٦, ٦٦. ٢٥٦-٢٥٧. ١٠.١٠٩٣/occurred/kqv١٠٦.
٢٣. Beckerman,H.,Eijssen,C.I.,Ierhulsdonck, M.C.V., : Fatigue Profiles in Patients with Multiple Sclerosis are Based on Severity of Fatigue and not on Dimensions of Fatigue, ٢٠٢٠, ١٠:٤١٦٧ | <https://doi.org/١٠.١٠٣٨/s٤١٥٩٨-٠٢٠-٦١٠٧٦-١>
٢٤. Hussein H., M., Aggag M.,F., Mohamed W.,O., Mohammad M.,T., Mahmoud A.,M. Demographic, clinical, and paraclinical characteristics of a sample of

- Egyptian MS patients attending MS clinic in al-Azhar university hospitals. *Al-Azhar Med. J.*, ٢٠١٩, Vol. ٤٨(٤), October, ٣٨٧-٣٩٦. DOI: ١٠.١٢٨١٦/amj.٢٠١٩.٦٤٩٤٦ h [ps://amj.journals.ekb.eg/article_٦٤٩٤٦.html](https://amj.journals.ekb.eg/article_٦٤٩٤٦.html)
٢٥. Schiess N, Fataftah T, Al-Kendi F, Szolics M.: Characteristics of a cohort of MS patients in Abu Dhabi: how similar to the west? *Multiple Sclerosis and Related Disorders*, ٢٠١٩, ٣:٧٦٠ -٧٦٣.
٢٦. Kapucu, s., AKKUŞ, Y., AKDEMİR, N.: Knowledge of Patients with Multiple Sclerosis about Their Disease and Prevention of Complications. *Journal of Neurological Sciences [Turkish]*, ٢٠١٩, ٢٨ : (٣) ٢٨; <http://www.jns.dergisi.org/text.php?id=٤٦١>.
٢٧. Zakaria, M. , Zamzam D., A. , Hafeez M.,A. , Mahmoud S. Swelam a , Shaimaa S. Khater a , Mai F. Fahmy a , Ayman Abdel Hady a , Mohamed M. Fouad a , Azza Abdel Nasser a , Hany Aref a , Mohsen Gadallah : Clinical characteristics of patients with multiple sclerosis enrolled in a new registry in Egypt. *Multiple Sclerosis and Related Disorders journal* [http://dx.doi.org/١٠.١٠١٦/j.msard. ٢٠١٦, ٠٦, ٠١٣ ٢٢١١-٠٣٤٨/& Elsevier B.V.](http://dx.doi.org/١٠.١٠١٦/j.msard.٢٠١٦.٠٦.٠١٣٢٢١١-٠٣٤٨/&ElsevierB.V)
٢٨. Abolfazli, R., Elyasi, A., Javadi, M. R., Gholami, K., Torkamandi, H., Amir-Shahkarami, M., Etemadifar, M., & Nasr, Z. Knowledge and attitude assessment of Iranian multiple sclerosis patients receiving interferon beta. *Iranian Journal of neurology*, ٢٠١٤, ١٣(٣), ١٦٠-١٦٧.
٢٩. Khan F., Amatya B., and Galea M.:Nursing intervention of fatigue in persons with multiple sclerosis, *Frontiers in Neurology* ·September ٢٠١٤ | Volume ٥ | Article ١٧٧ | ١.
٣٠. Mirhosseini, S., Mohammadi, A., Rezaei, M., Mirbagher, N.: The Effect of Benson Relaxation Technique on the Fatigue Severity of Patients with MS; *Journal of Client-Centered Nursing Care*, ٢٠١٩, ٥ (٣), pp. ١٧٥-١٨٢. <https://doi.org/١٠.٣٢٥٩٨/JCCNC.٥,٣,١٧٥>.
٣١. Rooney, s., Angus McFadyen, A., , Wood, L., & Paul, L., ; Minimally important difference of the Fatigue Severity Scale and Modified Fatigue Impact Scale in people with Multiple Sclerosis; *Multiple Sclerosis and Related Disorders Journal*. DOI: ١٠.١٠١٦/j.msard. ٢٠١٩, ٠٧, ٠٢٨.

Effect of Foot Reflexology with Pharmacological Treatment on Pain and Quality of Life among Elderly Suffering from Osteoarthritis

^١ Samia Ibrahim Baraka, ^٢ Ikbal Fathalla Elshafie, ^٣ Hanan Mohamed Al-saadane, ^٤ Entisar Abo Alghite El-Hossiny Elkazeh, ^٥ Samira El-Saied El-Mazayen.

^١ Assistant Lecturer, of Community Health Nursing, Faculty of Nursing, Tanta University, Egypt

^{٢,٤} Professor of Community Health Nursing, , Faculty of Nursing , Tanta University, Egypt

^٣ Professor of Physical Medicine, Rheumatology and Rehabilitation Department, Faculty of Medicine, Tanta University, Egypt

^٥ Assistant Professor of Community Health Nursing, Faculty of Nursing , Tanta University, Egypt.

Abstract

Elderly with osteoarthritis face considerable physical, social and emotional disabilities. In this chronic disease, there is no cure, improving elderly's quality of life and reduce joint pain are the best concern. **The aim of the study** was to evaluate the effect of foot reflexology with pharmacological treatment on pain and quality of life among elderly suffering from osteoarthritis in Tanta city. **Study design:** Experimental study design was used in this study. **Study settings:** This study was conducted at outpatient clinic in Physical, Rheumatology and Rehabilitation Department at Tanta University Hospital. **Study subjects:** A simple randomized sample of ١٧٥ elderly with osteoarthritis was included in the study. **Study tools:** Four tools were used by the researcher. **Tool I:** Structured Interview Schedule: which composed of three parts. **Part I:** Socio-demographic characteristics of the elderly. **Part II:** Medical history of the elderly. **Part III:** Anthropometric physical parameters. **Tool II:** Western Ontario and McMaster (WOMAC) Osteoarthritis Index. **Tool III:** Quality of Life Questionnaire. **Tool IV:** Knowledge regarding pharmacological treatment of OA. **Results:** The total mean WOMAC index was significantly reduced. Meanwhile, the total quality of life score increased immediately post and three months after implementation of the intervention ($p < ٠,٠٠٥$). Elderly knowledge about pharmacological treatment significantly improved immediately post program implementation for both groups ($p < ٠,٠٠٥$). **Conclusion:** Foot reflexology appears to have a significantly remarkable effect on pain reduction and improved quality of life. Also, the educational program of pharmacological osteoarthritis treatment was effective and improved elderly's knowledge of both groups. Therefore, Foot reflexology technique should be recommended in hospital protocols and gerontological nursing curriculum beside pharmacological treatment of osteoarthritis.

Key words: Foot Reflexology –pharmacological treatment – Pain- Quality of life- Osteoarthritis.

Introduction

Osteoarthritis (OA) is the most common musculoskeletal diseases (MSDs), affecting older people >٦٥ years old ^(١). It affects nearly ٣.٣ million globally and about ٣٢,٥ million in the United States ^(٢). Osteoarthritis is a classic age-related disorder. Although older age is the greatest risk factor for OA. Osteoarthritis isn't an inevitable consequence of aging process ^(٤). Aging changes in the musculoskeletal system increase the propensity to OA, but the joints affected and the severity of the disease are most closely related to other OA risk factors such as joint injury, obesity, genetics, and anatomical factors that affect joint mechanics ^(٥). Osteoarthritis can occur in any joint, but the joints more commonly affected by OA are the hands, feet, spine, and large weight-bearing joints, such as the knees and hips ^(٦).

There are two types of osteoarthritis: primary and secondary. Primary osteoarthritis is a chronic degenerative disease that is related to aging but not caused by any existing diseases or injury. Secondary osteoarthritis tends to show up earlier in life, often due to a specific cause such as an injury, a job that requires kneeling or squatting for long time, diabetes, or obesity ^(٧). The most common symptoms are joint pain and

stiffness. Usually, the symptoms progress slowly over years. Other symptoms may include joint swelling, decreased range of motion, when the back is affected, weakness or numbness of the arms and legs is existed ^(٨).

Osteoarthritis can cause inactivity in older people, secondary to pain and loss of function, and ultimately damages the quality of life. ^(٩). Osteoarthritis affects negatively on all context of quality of life, physically, in the form of pain, stiffness, and muscle weakness ^(١٠). Psychologically, in the form of fear and anxiety, depression from long duration of therapy, low self-esteem from dependence on others in doing self-activities, ineffective motivation, and financial constraints. Socially from absence from workplaces, social gatherings, and festivities ^(١١,١٢).

There is no definite curative treatment of OA, but all options are directed toward the relieving of OA signs and symptoms. There are pharmacological and non-pharmacological treatments of OA ^(١٣). Pharmacological treatment has a lot of side effects. Therefore, the need for using non-pharmacological treatment is urgently important ^(١٤). Non-pharmacological treatment such as weight reduction, physical exercise, using an assistive device,

occupational therapy, and using complementary and alternative therapy^(١٥). Reflexology is called zone therapy, which is an alternative medicine involving the application of pressure to the feet and hands with specific thumb, finger, and hand techniques that produce an effect elsewhere in the body^(١٦). Reflexology helps flush out the toxins from the body and this is important for relaxation of the body. Reflexology is an effective means of healing the body by relieving stress and muscle tension^(١٧). Community health nurse plays different roles when caring for elderly with osteoarthritis, undergoing of foot reflexology as care provider, educators, collaborator, administrator, and researcher. Today, community health nurse focus on the holistic health care and it is believed that complementary therapies are part of holistic nursing as it is one of the cheapest method of enhancing the whole dimensions of the health promotion of the elderly^(١١,١٢). It is expected from the community health nurses to develop nursing applications based on the complementary medicine in the elderly care. Also, community health nurse plays important role on promoting elderly compliance with the pharmacological method by giving them accurate, and concise knowledge

about their correct uses, side effect and instruction to prevent them^(١٨).

Aim of the Study

The aim of the study was to evaluate the effect of foot reflexology with pharmacological treatment on pain and quality of life among elderly suffering from osteoarthritis in Tanta city.

Research Hypothesis:

Foot reflexology with pharmacological treatment expect to positively reduce pain and improve quality of life more than pharmacological treatment only among elderly suffering from osteoarthritis.

Subjects and method

١- Subjects

Study design: Experimental research design was used in this study.

Study Setting: The study was conducted at outpatient clinic in Physical, Rheumatology and Rehabilitation Department at Tanta University Hospital.

Subjects: A simple randomized sample of ١٧٥ newly registered elderly with osteoarthritis.

Inclusion Criteria:

- ١- Subjects were eligible for inclusion in the study if their age was ٦٠ years old or over and they gave oral informed consent.
- ٢- Subjects who were free from vascular disease that affecting the lower extremities as calf pain, recent major

surgery, broken bones, sprains and bruises of the lower extremities.

- 3- Subjects who were free from mental or congenital health problems.

Subjects were classified into two groups.

- Group A was managed by foot reflexology with pharmacological treatment. This group included 100 elderly, classified into three equal subgroups of mild, moderate and severe degree of osteoarthritis and each subgroup included of 30 elderly.
- Group B was managed by pharmacological treatment only. It included 30 elderly.

Tool of data collection

Four tools were used by the researcher in order to obtain the necessary data.

Tool I: Structured Interview Schedule

This tool included three parts:

Part (1): Socio-demographic characteristics: such as age, sex, marital status, level of education, occupation, residence, and monthly income.

Part (2): Medical history: which included items related to onset, duration of the disease, family history, signs and symptoms, type of management (pharmacological & non – pharmacological treatment), drugs used (type, common side effects and their compliance) and degree of the disease.

Part (3): Anthropometric physical parameters: This part included measuring

of height (cm), weight (kg) and thigh circumference.

a)- The body mass index (BMI) was calculated according to Guidelines for Taiwan, (2011)⁽¹⁴⁾. It categorized into four levels: Underweight (BMI < 18.5), Ideal weight (BMI ≤ 18.5 - < 24.9), Overweight (BMI ≤ 25 - < 29.9) and Obese (BMI ≥ 30.0).

b)- Measuring Thigh Circumference: The thigh circumference was measured in cm and compared to the normal contralateral knee to determine the amount of quadriceps atrophy present⁽¹⁵⁾.

Thigh circumference was categorized into three levels:

- Less than 25th percentile indicated quadriceps muscle atrophy, from 25th to 50th percentile indicated normal quadriceps muscle circumference and from 50th and more percentile indicated of more quadriceps muscle circumference.

Tool II: Western Ontario and McMaster (WOMAC) Osteoarthritis Index:

This index was developed and adopted by Bellamy, (2000)⁽¹⁶⁾. It is a self-reporting measure of physical disabilities and comprised of 24 questions in three subscales (WOMAC pain, stiffness and physical function disability). There were five alternatives on the Likert scale for each question. They were 0 = no constraints

or difficulties, 1= slight, 2=moderate, 3=severe, 4= extreme constraints. The total score ranged from 0 to 96. **The total score was classified as the following:** No or slight constraints (0 - 24 degrees), moderate constraints (25 - 48 degrees), severe constraints (49 - 72 degrees) and extreme constraints (73 - 96 degrees).

Tool III: Quality of Life Questionnaire

This tool was developed by McHorney C, Ware J & Sherbourne C, (1992)⁽²²⁾ and composed of 36 questions (items) measuring physical and mental health status in relation to eight health domains: physical functioning, role limitations due to physical health, role limitations due to emotional health, vitality (energy/fatigue), emotional well-being, social functioning, pain and general health. **The total scoring system for elderly's quality of life was as follow:** Poor quality of life: <0% of the total score, fair quality of life: 0 - <50% of the total score and good quality of life: >50% of the total score.

Tool IV: Knowledge of the studied elderly regarding pharmacological treatment of OA

This tool was developed by the researcher based on the literature review^(10,10,23,24). It consisted of 43 multiple choice questions that covered the following items: drug used, drug side effects, contraindications,

instructions of use and compliance of these drugs. **Knowledge score was calculated as follows:** the correct answer scored "one", the incorrect answer scored "zero". **The total scoring system for elderly's knowledge** was classified into: Poor knowledge: <0% (<21 grades), Fair knowledge: 0 - 60% (21-27 grades) and Good knowledge: >60% (> 27 grades) of the total knowledge score.

Method

The study was carried out as follows:

1-Obtaining approval was obtained from the Dean of the Faculty of Nursing to Manager of Physical, Rheumatology and Rehabilitation Center in Tanta University Hospital to conduct the study.

2- Ethical considerations: -

Subjects were informed about the confidentiality of the information and the nature of the study does not cause any harm or pain. Subjects were assured that the data collected will be used only for the purpose of the study. Oral consents of subjects were obtained to participate in the study after explaining the aim of the study.

3- Developing the study tools:

- The study tools I part (1&2) and tool IV were developed based on review of related literature^(10,10,23,24) but, tools (II, III & I part 3) were adopted and translated into Arabic language. Five expertise in the

field of community health nursing & physical, rheumatology and rehabilitation department of Tanta University Hospital tested the face and the content validity =٩٥%.

٤- Conducting pilot study:

- A pilot study was carried out on ٢٠ elderly to test the tools for its clarity, organization, applicability of the study tools. The necessary modifications were done accordingly. The Pilot study was excluded from the study sample (Cronbach's Alpha which was ٠,٨٦).

٥- Actual Study: was conducted through the following phases:

- I- Assessment phase:** in which the researcher used the pre designed study tools and interviewing each elderly of both groups (A&B) individually in the predetermined setting to assess knowledge regarding pharmacological treatment, pain level and quality of life for elderly suffering from osteoarthritis as a pre-intervention assessment.
- II- Planning phase:** Health education program about pharmacological treatment for both groups and foot reflexology intervention for the study group were organized. This phase included two parts.
A-Planning phase for foot reflexology program.

The intervention program was be planned according to elderly's needs determined at the assessment phase with the assistance of professor of physical medicine, rheumatology & rehabilitation department as well as based on literature review.

B- Planning phase for health education program: two health education sessions about medications and their compliance were administered for both groups.

The planning phase included the following steps:-

- ١-Setting the goal and objectives of intervention program:
- ٢-Preparing and organizing the content of the intervention program which covered the reasons behind the application of the session.

III- Implementation phase:

- The researcher took a training sessions on reflexology technique by professor of Physical, Rheumatology and Rehabilitation department at Tanta University Hospital for a period of one month.
- The program was totally carried out by the researcher in the previously mentioned setting throughout the week according to the work schedule of the department.

Group A: Study Group

Foot reflexology technique: The researcher met the subjects three times per week for group A with severe osteoarthritis (٣٦ sessions/٣months) and ٢ times per week for group A for those with mild and moderate degrees of osteoarthritis (٢٤ sessions/٣months). Health education program: The researcher gave two health education sessions during the application of the foot reflexology technique individually for each elderly.

The sessions of the reflexology technique: consist of

A-Preparatory phase

Elderly sit in a supine position, and the nurse sit on a chair facing the elderly's feet, with the feet of the elderly at the nurse's chest level. Relaxation techniques (deep breathing exercise and using smoothing essential oils (lavender oil) was applied firstly to the both feet for ٥ minutes.

B-Application phase of foot reflexology on elderly's feet.

This phase took ١٥ minutes for each foot. All reflex points that affect whether directly or in directly on reducing of pain and improve of function of the affected joints were stimulated with thumb pressing, finger pressing, rubbing, stroking and squeezing plus all the affected joints

with osteoarthritis such spinal column, shoulder and the elbow and solar plexus for ١٥ minutes. Finally, finishing the massage by lifting the foot under the ankle with an inactive hand, then pulling the static tissue in the ankle for a short seconds (١٥ seconds and then releasing it), as well as constant pressure on this area in circular movements from top to bottom and back.

GROUP B: Control Group

- The researcher divided the control group into ٢ equal small subgroups
- (each group was about ٢٥elderly). The researcher gave sessions of health education on consecutive days through the week. The total days for these sessions were ٢ days for ٢ subgroups of control group. . Each session took ٦٠ minutes.
- The implementation phase was conducted on the second months of starting of the data collection and the total duration of the study was about ٨-٩ months from the first of February to the middle of January ٢٠٢١ except period from ٢٨ march to ١٦ July ٢٠٢٠ because it is period of corona ban on outpatient clinics .

Evaluation phase:

The Effects of the foot reflexology and educational program on elderly's pain and quality of life were done through comparing the pretest and posttest. This phase was done three times before,

immediately and three months after the intervention program implementation.

Results

Table (I) represents the distribution of the studied elderly according to their socio-demographic characteristics. This table showed that the mean age of the study group was 69.0 ± 6.829 years and 61.9% of them were females, while the mean age of the control was 68.63 ± 6.11 years and 72.9% of them were females, 41.9% of the study group were married and 30.0% were widow compared to 38.6% and 34.3% were married and widow respectively of the control group. About 20.7% of the study group and 31.4% of the control group were illiterates compared to 29.6% and 31.0% of the study and control groups respectively were university and postgraduates. 00.2% and 62.9% of the study and control groups respectively had adequate income. Nearly 41% and 30.7% of the study and control groups respectively lived with spouse, 07.1% and 60.0% of the study and control groups respectively came from rural area.

Table (II) represents the distribution of the studied elderly according to their medical history of OA, duration, affected joints, symptoms, OA degrees, body mass index and thigh circumference and. It showed that 62.8%, 62.9% of the study and

control groups respectively had OA from < 5 years, while 4.8% and 0.7% respectively had OA from 20 < 30 years. The majority of both the study and control groups (88.6% and 90.7% respectively) had knee joint OA. Concerning reported symptoms of OA, about 74.8%, 74.8% and 72.4% of the study group complained of stiffness, increase pain during physical activities and limited physical movement respectively, followed by crackling sound by 64.8% and finally swelling by 01.4%. As regards the control group 80% and 74.3% of them reported limited physical movement and increased pain respectively, followed by joint stiffness by 68.6% and finally swelling by 44.3%. One third (33.3%, 33.3%, 33.3%) of the study group had mild, moderate, and severe degrees of the osteoarthritis. This is compared to 32.9%, 30.7% and 31.4% of the control group had mild, moderate, and severe degree respectively. Regarding the mean of BMI of the study group, it was 23.07 ± 4.98 , while it was 20.10 ± 6.02 Kg/(m)² for the control group. More than half (03.3% and 07.1%) of the study and control groups respectively had thigh circumference $\geq 95^{\text{th}}$ percentile compared to 11.4% and 8.6% of the elderly from both groups respectively suffered from muscle atrophy.

Table (III) Shows that the mean total score of WOMAC of the study group was 70.60 ± 18.02 pre intervention, while it was 43.40 ± 13.6 immediately after implementation of the intervention. After three months of the implementation of the intervention, it was 40.64 ± 16.31 . There was a statistically significant improvement of the total WOMAC score from the baseline total score to the total score three months after implementation of intervention ($p=0.000$). For the control group, slightly more than half (51.4%) had moderate constraints, while 1.4% had mild or no constraints pre and three months after the implementation of the intervention with no a statistically significant difference from the base line assessment to the three months posttest ($p=0.130$). There was a statistically significant difference between the total mean of WOMAC index three months after implementation of the intervention between the study and control groups ($p=0.021$).

Table (IV) represents mean and standard deviation of the study group in relation to degree of OA and WOMAC index subscale. There was a statistically significant improvement in the mean scores of elderly with mild, moderate and severe degrees of osteoarthritis pre, immediately post and three months after implementation

of the intervention regarding total WOMAC pain subscale, stiffness subscale and total physical function disabilities ($p<0.05$). Regarding the total WOMAC score, the great improvement was seen in mild degree with the mean of 34.08 ± 2.16 pre intervention, to 14.08 ± 1.84 immediately post and 17.33 ± 1.23 three months after intervention with statistically significant difference (pre, immediately post), (pre, three months) and immediately post, three months ($p=0.000$). The total WOMAC for the moderate degree changed from 57.10 ± 2.27 to 46 ± 2.02 three months posttest with a statistically significant difference from pre intervention to three months after implementation of the intervention ($p=0.000$). The total WOMAC score for severe degree was 79.92 ± 2.11 as the initial assessment and changed to 70.84 ± 1.46 three months after implementation of the intervention with a statistically significant difference in pre, immediately post and pre- three months posttest only ($p=0.000$) and there was no a statistically significant difference in immediately post and three months posttest ($p=0.109$).

Table (V) Shows the distribution of the studied elderly in relation to total score of quality of life. The total mean score of the quality of life of the study group increased

from 32.81 ± 12.38 pre intervention to 52.77 ± 16.21 immediately post and 55.06 ± 16.78 three months after the implementation of the intervention, with a statistically significant difference between them ($P=0.000$). Regarding the control group, there was no a statistically significant difference in the total mean quality of life score pre, immediate post and three months after the implementation of the intervention ($p=0.008$). There was a statistically significant difference between the total mean three months quality of life score of the study and the control groups ($p=0.000$).

Table (VI) represents mean and standard deviation of the studied elderly in relation to total quality of life and degree of osteoarthritis among the elderly suffering from osteoarthritis. Concerning the total mean score of quality of life, for elderly with the mild degree of osteoarthritis, it was found that the total mean quality increased from 40.87 ± 1.01 pre intervention to be 63.04 ± 2.06 and 65.77 ± 2.89 immediately post and three months after the implementation of the intervention with a statistically significant difference from pre intervention to three months after the implementation of the intervention ($p=0.000$). For elderly with

moderate degree of osteoarthritis, the total mean score of quality of life increased from 36.78 ± 3.68 pre intervention to be 50.16 ± 2.18 and 57.01 ± 1.71 immediately post and three months after the implementation of the intervention respectively with a statistically significant difference from pre to three months after the implementation of the intervention ($p=0.000$). For elderly with severe degree of osteoarthritis, the total mean score of quality of life increased from 20.14 ± 1.32 pre intervention to 30.83 ± 1.31 and 32.01 ± 1.33 immediately post and three months after the implementation of the intervention with a statistically significant difference from pre intervention to three months after the implementation of the intervention ($p=0.000$).

Table (VII) Shows the distribution of the studied elderly according to their total knowledge score regarding the pharmacological treatment, it was observed that, all the study and control groups had poor level of knowledge with the total mean of 9.14 ± 2.90 and 9.40 ± 2.61 respectively preprogram. After the implementation of the educational program, more than half (56.2%) and more than two fifths (40.7%) of both the study and control groups respectively had fair level with the total means of 20.97 ± 3.31

for the study group and $٢١,٧٤ \pm ٣,١٦$ for the control group immediately post educational program. There was a statistically significant difference between preprogram and immediately post educational program in each the study and control groups ($p= ٠,٠٠٠$), also there was a statistically significant difference between immediately post educational program total mean knowledge between the study and control groups ($P= ٠,٠٠٠$).

Table (VIII) shows correlation between quality of life , WOMAC and knowledge regarding the pharmacological treatment of the Osteoarthritis. the present study revealed that there was a negative correlation between total quality of life score and total WOMAC index, also negative correlation between total knowledge score and total WOMAC index

for the study and control group pre, immediately post and three months after the implementation of the intervention. Moreover, there was a positive correlation between quality of life and total knowledge score for both groups pre, immediately post and three months after the implementation of the intervention.

(I): Distribution of the studied elderly according to their socio-demographic characteristics

Socio-demographic Characteristics	The studied elderly (n=١٧٥)			
	Study group (n=١٠٥)		Control group (n=٧٠)	
	n	%	n	%
Age/years				
٦٠ < ٧٠	٦٥	٦١,٩	٤٩	٧٠
٧٠ - ٨٠	٣٤	٣٢,٤	١٨	٢٥,٧
> ٨٠ years	٦	٥,٧	٣	٤,٣
Range	(٦٠ - ٨٦)		(٦٠ - ٨٥)	
Mean \pm SD	٦٩,٥٠ \pm ٦,٨٢٩		٦٨,٦٣ \pm ٦,٦١	
Gender				
Female	٦٥	٦١,٩	٥١	٧٢,٩
Male	٤٠	٣٨,١	١٩	٢٧,١
Material Status				
Married	٤٤	٤١,٩	٢٧	٣٨,٦
Widow	٣٢	٣٠,٥	٢٤	٣٤,٣
Divorced	١٥	١٤,٣	١٠	١٤,٣
Single	١٤	١٣,٣	٩	١٢,٩
Education				
Illiterate	٢٧	٢٥,٧	٢٢	٣١,٤
Read and write	١٣	١٢,٤	٩	١٢,٩
Elementary	١٥	١٤,٣	٥	٧,١
Secondary	١٩	١٨,١	١٢	١٧,١
University & postgraduates	٣١	٢٩,٦	٢٢	٣١,٥
Occupation before retirement				
Housewife	٣٨	٣٦,٢	٢٥	٣٥,٧
clerical work	٢٣	٢١,٩	١٦	٢٢,٩
Manual work	٢١	٢٠	١٣	١٨,٦
Professional work	١٧	١٦,٢	١٥	٢١,٤
Private work	٦	٥,٧	١	١,٤
Income				
Adequate	٥٨	٥٥,٢	٤٤	٦٢,٩
Not Adequate	٢٩	٢٧,٦	١١	١٥,٧
Adequate and Save	١٨	١٧,١	١٥	٢١,٤
Living with				
Spouse	٤٣	٤١,٠	٢٥	٣٥,٧
Alone	٢٩	٢٧,٦	٢٤	٣٤,٣
son/daughter	١١	١٠,٥	٤	٥,٧
Geriatric room	١٤	١٣,٣	٩	١٢,٩
Relatives	٨	٧,٦	٨	١١,٤
Residence				
Rural	٦٠	٥٧,١	٤٢	٦٠
Urban	٤٥	٤٢,٩	٢٨	٤٠,٠

Table (II): Distribution of the studied groups in relation to their medical history of osteoarthritis

Medical History	The Studied Elderly (n=١٧٥)			
	Study Group (n=١٠٥)		Control Group (n=٧٠)	
OA ^a duration \years	N	%	n	%
<٥	٦٦	٦٢,٨	٤٤	٦٢,٩
٥ < ١٠	١٦	١٥,٢	١٤	٢٠
١٠ < ١٥	١٠	٩,٥	٧	١٠
١٥ < ٢٠	٨	٧,٦	١	١,٤
٢٠ < ٢٥	٥	٤,٨	٤	٥,٧
***Affected Joints				
knee joint	٩٣	٨٨,٦	٦٧	٩٥,٧
Neck Joint	٣٩	٣٧,١	٢٩	٤١,٤
Spinal cord vertebra	٣٦	٣٤,٣	٢٨	٤٠
hip joint	١٦	١٥,٢	١٠	١٤,٣
Fingers joint	١٢	١١,٤	٧	١٠
elbow joint	٩	٨,٦	٩	١٢,٩
***symptoms of OA ^a				
Stiffness	٧٧	٧٤,٨	٤٨	٦٨,٦
Increased pain during performing of physical actives	٧٧	٧٤,٨	٥٢	٧٤,٣
Limited of physical movement	٧٦	٧٢,٤	٥٦	٨٠,٠
Crackling sound when bending joint	٦٨	٦٤,٨	٣٧	٥٢,٩
Swelling around joint	٥٤	٥١,٤	٣١	٤٤,٣
Degree of OA ^a				
Mild	٣٥	٣٣,٣	٢٣	٣٢,٩
Moderate	٣٥	٣٣,٣	٢٥	٣٥,٧
Severe	٣٥	٣٣,٣	٢٢	٣١,٤
Height (Meter) Mean & SD	١,٦٢±٠,٠٧٨		١,٦٣±٠,٠٧٩	
Weight\ (Kg) Mean & SD	٩٠,٦٥±١٣,٨٣		٨٦,٩١±١٤,٣٤	
BMI ▪ ١٨,٥- ٢٤,٩ Kg\ (m) ^٢ ▪ ٢٥-<٣٠ Kg\ (m) ^٢ ▪ ≥ ٣٠ Kg\ (m) ^٢	١١	١٠,٥	٦	٨,٦
	١٤	١٣,٣	١١	١٥,٧
	٨٠	٧٦,٢	٥٣	٧٥,٧
Range	(٢٢,٥ – ٤٤,١)		(٢٢,٥- ٥٠,٦٠)	
Mean & SD	٣٣,٠٧± ٤,٩٨		٣٥,١٥± ٦,٥٢	
Thigh Circumference				
▪ < ٢,٥ th percentile (muscle atrophy)	١٢	١١,٤	٦	٨,٦
▪ From ٢,٥ th - ٩٠. th percentile (normal)	٣٧	٣٥,٢	٢٤	٣٤,٣
▪ From ٩٥ th & more	٥٦	٥٣,٣	٤٠	٥٧,١

Table (III): Distribution of the studied groups in relation to their total score of WOMAC osteoarthritis index

WOMAC Score	The Studied Elderly (n=١٧٥)														t test & p value between ٣ month total score study & control groups
	Study Group (n=١٠٥)							Control Group (n=٧٠)							
	Pre intervention		Immediate post intervention		٣ months Post intervention		X ^٢ P	Pre intervention		Immediate post intervention		٣ months Post intervention		X ^٢ P	
	N	%	n	%	n	%		n	%	N	%	n	%		
WOMAC Score															
No or mild	١	١	٣٤	٣٢,٤	٣٢	٣٠,٥	١٦٨,٢١	١	١,٤	١	١,٤	١	١,٤	٢,٣٤	٨,٨٩ ٠,٠٢١**
Moderate	٣٣	٣١,٤	٣٠	٢٨,٦	٢٧	٢٥,٧	٠,٠٠٠**	٣٦	٥١,٤	٣٥	٥٠	٣٦	٥١,٤	٠,١٣٥	
Severe	٣٦	٣٤,٣	٣١	٢٩,٥	٣٠	٢٨,٦		٢٥	٣٥,٧	٢٦	٣٧,١	٢٥	٣٥,٧		
Extreme	٣٥	٣٣,٣	١٠	٩,٥	١٦	١٥,٢		٨	١١,٤	٨	١١,٤	٨	١١,٤		
Range	(٢٠-٩٥)		(١٥-٧٦)		(١٩-٧٩)		F\P	(١٦-٨٧)		(١٦-٨٧)		(١٦-٨٧)		F\P	
Mean &SD	٦٠,٦٥±١٨,٠٢		٤٣,٤٥±١٣,٦		٤٥,٦٤±١٦,٣١		١٥٢,٧١ ٠,٠٠٠**	٥١,٤٠±١٦,٤		٥١,٤٢±١٦,٥		٥١,٤٢±١٦,٥		٢,٠٢٩ ٠,١٥٩	

Table (IV): Mean and standard deviation of the study group in relation to degree of OA and WOMAC index subscale

OA Degrees	The study Group n=١٠٥			
	Pre intervention	Immediate post-intervention	٣months post intervention	F P
	Mean &SD	Mean &SD	Mean &SD	
Total WOMAC Pain Subscale				
Mild	٧,٩٢±٠,٦٤	٣,٣٣±٠,٤٨	٣,٥٨±٠,٣٣	٢٩,١٥ ٠,٠٠٠**
Moderate	١٣,١٠±٠,٥٨	٩,٧٠±٠,٤٩	١٠,٤٠±٠,٤٣	٥٣,٦١ ٠,٠٠٠**
Severe	١٦,٢٣±٠,٦٦	١٣,٧٦±٠,٣٠٣	١٣,٦٩±٠,٣٠٨	١٣,٩٦ ٠,٠٠١**
Total WOMAC Stiffness Subscale				
Mild	٢,٦٦±٠,٢٢	٠,٩١±٠,٢٣	٠,٨٣±٠,٢٧	٤٦,٥٤ ٠,٠٠٠**
Moderate	٤,٧٠±٠,٣٣	٣,٧٠±٠,٣٤	٣,٣٠±٠,٣٠	١١,٤٥ ٠,٠٠٤**
Severe	٦,٦١±٠,٢١	٥,٧٦±٠,١٦	٥,٧٠±٠,٢١	١٨,٣٣ ٠,٠٠٠**
Total Physical function disabilities Score				
Mild	٢٤,٠±١,٩٣	٩,٦٧±١,٥٦	١٣,٣٣±١,٢	٥٤,٨٩ ٠,٠٠٠**
Moderate	٣٩,٣٠±٢,١٦	٣٢,٦٠±١,٠٩	٣٢,٤٠±١,٧٧	٥,٧٣ ٠,٠٠٠**
Severe	٥٧,٠٧±١,٧٢	٥١,٢٣±١,٢٣	٥٢,٠±١,٤	١٣,٠٦ ٠,٠٠٠**
Total WOMAC Score				
Mild	٣٤,٥٨±٢,١٦	١٤,٥٨± ١,٨٤	١٧,٣٣± ١,٢٣	١٢٢,٠٧ ٠,٠٠٠**
t P (Pre & immediate post)	١٤,٩٠ ٠,٠٠٠**			
t P (Pre & ٣months)	١٥,٨١ ٠,٠٠٠**			

tP (immediate post & ٧ months)	٤,٣١ ٠,٠٠٠**			
Moderate	٥٧,١٠±٢,٢٧	٤٥,٩٠± ١,٤٧	٤٦±٢,٠٢	١١٢,١٣ ٠,٠٠٠**
tP (Pre & immediate post)	١٥,٤١ ٠,٠٠٠**			
tP (Pre & ٧ months)	١٥,١٦ ٠,٠٠٠**			
tP (immediate post & ٧ months)	١,٥١ ٠,١٤٠			
Severe	٧٩,٩٢±٢,١١	٧٠,٢٣± ١,١٨	٧٠,٨٤± ١,٤٦	٣٧,٣٦ ٠,٠٠٠**
tP (Pre & immediate post)	٨,٧١ ٠,٠٠٠**			
tP (Pre & ٧ months)	٧,٨٠ ٠,٠٠٠**			
tP (immediate post & ٧ months	١,٦٤٥ ٠,١٠٩			

Table (VI) : Mean and standard deviation of the studied elderly according to total quality of life and degree of osteoarthritis among the elderly suffering from osteoarthritis

Total score of quality of life	The Studied Elderly (n=١٧٥)														
	Study Group (n=١٠٥)						Friedm an test (X ^٢)	Control Group (n=٧٠)						Friedman test (X ^٢)	(X ^٢) between ٣ months posttest study and control
	Pre intervention		Immediate post intervention		٣ months Post Intervention			Pre intervention		Immediate post Intervention		٣ months Post intervention			
	n	%	n	%	n	%	n	%	n	%	n	%	٠,٠٠٠ ١,٠٠٠	٣٠,٦٤ ٠,٠٠٠**	
Poor	٩٤	٨٩,٥	٣٩	٣٧,١	٣٦	٣٤,٣	١٨١,٦٨ ٠,٠٠٠**	٥٢	٧٤,٣	٥٣	٧٥,٧	٥٢	٧٤,٣		
Fair	١١	١٠,٥	٥٤	٥١,٤	٥٢	٤٩,٥		١٨	٢٥,٧	١٧	٢٤,٣	١٨	٢٥,٧		
Good	٠	٠,٠	١٢	١١,٤	١٧	١٦,٢		٠	٠,٠	٠	٠,٠	٠	٠,٠		
Range Mean & SD	(٩-٦٧) ٣٢,٨١±١٢,٣٨		(٢١-٨١) ٥٢,٧٧±١٦,٢١		(٢٤-٨١) ٥٥,٥٦±١٦,٧٨		F\P ٢٦٦,٩٨ ٠,٠٠٠**	(١٣-٧١) ٣٧,٩٧±١٤,٧٩		(١٣-٧١) ٣٧,٩٧±١٤,٧٩		(١٤-٧١) ٣٧,٩٠±١٤,٦٠		F\P ٠,٣٤٦ ٠,٥٥٨	t\P= ١٠,٨٩ ٠,٠٠٠**

Table (VII): Distribution of the studied elderly according to their total knowledge score regarding to pharmacological treatment of OA

Total Knowledge score	The Studied Elderly (n=١٧٥)										t test\ P between immediate post mean Study Vs. Control groups
	Study Group (n=١٠٥)					Control Group (n=٧٠)					
	Pre program		Immediate post program		T test \P between mean pre and post program	Pre program		Immediate post program		T test \P between mean pre and post program	
	N	%	N	%		n	%	n	%		
Poor	١٠٥	١٠٠	٨	٧,٦	Paired t test= ٣٧,٤٦ P= ٠,٠٠٠**	٧٠	١٠٠	٣٤	٤٨,٦	Paired t test= ٢٧,٤٥ P= ٠,٠٠٠**	٢٣,٦٧ ٠,٠٠٠**
Fair	٠	٠,٠	٥٩	٥٦,٢		٠	٠,٠	٣٢	٤٥,٧		
Good	٠	٠,٠	٣٨	٣٦,٢		٠	٠,٠	٤	٥,٧		
Range Mean &SD	(٣-١٨) ٩,١٤±٢,٩٠		(١٥-٣٣) ٢٥,٩٧±٣,٣١			(٣-١٧) ٩,٤٠±٢,٦١		(١٦-٢٨) ٢١,٧٤±٣,١٦			

Table (VIII): Correlation between quality of life, WOMAC and knowledge regarding the pharmacological treatment of the Osteoarthritis

Variables	The Studied Elderly (n=١٧٥)											
	Study Group (n=١٠٥)						Control Group (n=٧٠)					
	Total Quality of life score			WOMAC score			Total Quality of life score			WOMAC score		
	Pre intervensi on	Immed iately- post	٣ months Post	Pre interve nsion	Immedia tely-post	٣ month s Post	Pre interve nsion	Immedi ately- post	٣ months Post	Pre intervensi on	Immediatel y-post	٣ months Post
	r P	R P	r P	r P	R P	R P	r P	R P	R P	r P	r P	r P
WOMAC Score	-٠,٦٧٣ ٠,٠٠٠**	-٠,٦٨٥ ٠,٠٠٠**	-٠,٦٩٢ ٠,٠٠٠* *	----- ----- -	----- ----- -	----- ----- -	-٠,٣٢٣ ٠,٠٠١* *	-٠,٤٢٢ ٠,٠٠١**	-٠,٣٦٩ ٠,٠٠١**	----- ----- -	----- ----- -	----- ----- -
Total knowledge score	٠,٦٩٢ ٠,٠٠٠**	٠,٨٧٤ ٠,٠٠٠**	----- ----- -	-٠,٣٤٦ ٠,٠٠١* *	-٠,٣٨٣ ٠,٠٠١**	----- ----- -	٠,٢٦٣ ٠,٠٢٨*	٠,٢٧٢ ٠,٠٢٣*	----- ----- -	-٠,٥٦٩ ٠,٠٠٠*	-٠,٦٧٨ ٠,٠٠٠*	----- ----- -

*Correlation is significant at the (p < ٠,٠٥ level) (٧-tailed)

**Correlation is significant at the (p < ٠,٠١ level) (٧-tailed)

Discussion

Osteoarthritis (OA) is considered the most common musculoskeletal diseases all over the world. It is a painful and disabling inflammatory disease of the joints and is caused by multiple factors as joint injury, overuse, obesity, heredity and increasing age⁽⁴⁾. Osteoarthritis is not cured, its care focuses on preserving the elderly's functional ability by managing pain, other symptoms and improving joint movement and function. Foot Reflexology is an alternative complementary therapy that uses reflex points on the hands and feet to stimulate the body's healing⁽⁴⁾.

It can be used effectively with OA. It is designed to bring the body into balance by applying pressure at points corresponding to areas of the body⁽¹¹⁾. It is effective in release of endorphins and blocks the pain pathways which cause effective pain relief⁽¹⁴⁾. The findings of this study revealed that the mean age of the study group was 79.00 years and less than two thirds of them were females, while the mean age of the control group was 78.73 years and three quarters of them were females. (**Table I**). This may be due to the fact that, along with the rise in age, the cartilage inside a joint becomes thinner and

components of the cartilage become altered, which may make the joint less resilient and more susceptible to damage and this may lead to osteoarthritis. This finding is in the line with **Lęgosz et al., (2020)**⁽¹⁵⁾, who assessed the complexity of molecular processes in osteoarthritis of the knee joint in Poland and reported that the mean age of the patients with osteoarthritis was 71.26 ± 4.88 years. The study result is also consistent with the findings of the **Center for Disease Control and Prevention (CDC) and National Public Health Agenda for Osteoarthritis (2020)**⁽¹⁷⁾, that reported that the prevalence of OA was more among whose age above 60 years and among the females related to loss or reduce of calcium and vitamin D that responsible for increase of bone density. Osteoarthritis has a lot of reported symptoms include pain, morning and night stiffness, reduced range of joint movement, crepitation, fatigue, sleep disturbance, experience of social isolation⁽¹¹⁾. The present study demonstrated that about three quarters of the study group complained of stiffness, increase pain during physical activities and limited physical movement, followed by crackling sound by about two thirds and finally swelling by half of the elderly. (**Table II**). This may be explained by that when

osteoarthritis occurred, the cartilage that prevent friction between two bones during movement teared or lost thus, pain during movement occurred, followed by swelling, redness and stiffness, which prohibit elderly from doing the daily activities. Also, these symptoms were aggravated by the prevalence of obesity among the studied participants. The present study is similar with **Abdel Mohsen et al., (٢٠١٨)^(٢٧)**, who assessed the physical functional status among patients with hip osteoarthritis in Fayoum governorate, reported that all subjects had more than one complaint such as severe pain at the affected joint, inability of movements, joint stiffness, numbness and joint crepitation.

Foot reflexology is a noninvasive and manual therapeutically approaches that helps to improve the performance in elderly's life day to day activities and has a valuable effect on the quality of life and the well-being, ^(٢٧). From this point, the present study showed that, there was significant improvement in the total WOMAC score from pre to immediate and three months post implementation of the program. Also there was a statistical significant improvement in the mean score of all items of pain severity, stiffness, and physical functional disability subscales of

WOMAC index. For the control group, no significant improvement in the mean score of total WOMAC was observed through the study phases(**Table III**). Reduction of the pain severity, stiffness and physical functional constraints among the studied elderly, could be attributed by giving pressure at the reflex points on the foot by foot reflexology, helped in release of endorphins and blocked the pain pathways which caused effective pain relief. Also, it was effective in enhance circulation and remove waste products from the body that improve joint mobility. This is in agreement with a study conducted by **Abdelaziz et al., (٢٠١٩)^(٢٨)**, who made a study about the effect of reflexology on knee osteoarthritis patients at Cairo University, and concluded that there was an improvement in the average of WOMAC score after the intervention for the study group. Moreover, the patients reported a reduction in pain intensity, joint stiffness, improvement in the physical functions and no improvement was observed in the control group. Osteoarthritis has a profound impact on every aspect of a person's life.

Ongoing pain, physical limitations and depression can affect an individual's ability to engage in social, community and occupational activities ^(٢٩). The present

study revealed that, before the implementation of the intervention, the majority of the study group and slightly less than three quarters of the control group had poor level of quality of life pre intervention (**Table V**). After the implementation of foot reflexology intervention, the present study demonstrated that, for the study group, there was a statistically significant improvement in the mean score of all domains of the quality of life through the study phases. On the other hand for the control group, there was no statistically significant improvement in the mean score of all domains of the quality of life pre, immediately post and 3 months after implementation of the intervention. (**Table V**).

Improvement of the elderly's quality of life may be explained by that the reduction of pain and stiffness intensity by foot reflexology may improve elderly's independent involvement in personnel and self-care, as well as social functioning, with positive impact on self-esteem and quality of life. This finding is in line with a study made by **Lee et al., (2020)⁽²⁷⁾**, who studied the relationship between obesity and balance in the community-dwelling elderly population in South Korea, and another study made by **Xiaonan and**

Dinglu (2020)⁽³⁾, who assessed the quality of life of older people with osteoarthritis in China. They concluded that the patients with osteoarthritis had low level of quality of life both physically and mentally. The present study showed that the best improvement in the total mean of WOMAC index and total mean of quality of life was seen for mild degree of osteoarthritis, moderate degree came in the second level of improvement and finally the lowest improvement was seen for the severe degree of osteoarthritis. There was statistically significant difference with in the whole study period for each different osteoarthritis degrees (**Table IV and VI**). This could be explained by that the mild degree of osteoarthritis had low or mild symptoms so when the foot reflexology applied, the best improvement was seen, but the severe degree needed complex and multi approach management plan and some of these elderly may need surgery as their final choice to cure the osteoarthritis.

The present study finding is supported by **Barot (2019)⁽²¹⁾** who studied the reflexology benefits and limitations, and found that foot reflexology did not guarantee to cure some serious problems or critical stage of illness and could not be used as conventional medicines / medications to cure the problem

completely. The present study finding was also supported by the **American College of Rheumatology** (٢٠٢٠)^(٣٧), that revealed that massage therapy was considered conditionally recommended for hand, hip and knee osteoarthritis. This means that some cases of osteoarthritis had positive outcomes and minimal risk and felt strongly that massage therapy was beneficial for symptom management. However, other cases of osteoarthritis specifically, were conditional recommended against the use of massage for reduction of OA symptoms.

Concerning the knowledge of the elderly about the pharmacological treatment of osteoarthritis, the present study found that before implementation of the educational program, all the elderly of study and control groups had poor total knowledge score before implementation of the educational program. After the implementation of the educational program, There was a statistically significant improvement of their knowledge (**Table VII**). Poor elderly knowledge pre educational program may be attributed by as people grow old, they became less motivated to gain more health information compared to younger ones, Furthermore, the drugs that used for the treatment of osteoarthritis had multi

approached and different chemical names that were very difficult for elderly to memorize them.

Improvement of the elderly's knowledge after the implementation of the educational program may be due to the effect of educational program that motivate the elderly to ask questions and gain more information, as well as the effect of foot reflexology on reducing of pain, stiffness, physical functional constraints, and improve the quality of life. These improvements led to relaxation of the elderly and enhance the ability to understand the components of the educational program of pharmacological treatment. This is in line with a study done by **Abdel Mohsen et al.**, (٢٠١٨)^(٣٨), who concluded that the majority of nurses had poor level of knowledge and awareness related to risk factors, exercises, diet and treatment methods that required to enhance patients' physical function pre educational program ,but after implementation of the educational program, there was statistically significant increase in their knowledge .

The present study revealed that there was a negative correlation between total quality of life score and total WOMAC index, also negative correlation between total knowledge score and total WOMAC index for the study and control group pre,

immediately post and three months after the implementation of the intervention. Moreover, there was a positive correlation between quality of life and total knowledge score for both groups pre, immediately post and three months after the implementation of the intervention (**Table VIII**). This may be explained by that high degree of pain, stiffness and physical constraints could lead to severe deterioration in the quality of elderly life. However, when the elderly had good knowledge about the correct use of the pharmacological treatment of OA, this could reduce of pain and enhance of the quality of life. This is in agreement with **Khachiana et al., (٢٠٢٠)** ^(٢٢), who studied the effect of self-management program on outcome of adult knee osteoarthritis in Iran, and reported that the self-management program, which included pain relief methods, proper diet and exercise, resulted in reducing pain, symptoms, enhance function and improvement of the quality of life. Moreover, a study made by **Gay et al., (٢٠١٨)** ^(٢٤) who studied the efficacy of self-management exercise program with spa therapy for behavioral management of knee osteoarthritis in France, showed that health education program could improve the physical activity of male and female patients with osteoarthritis aged ٥٠ – ٧٥ years old.

Conclusion

Based on the findings of the present study, it can be concluded that, foot reflexology for elderly suffering from osteoarthritis, appears to have a significantly remarkable effect on pain reduction and improved quality of life for the study group. Meanwhile, the total quality of life score increased immediately post and three months after implementation of the intervention. However, the control group showed no statistically significant difference between pre and three months after implementation of the intervention. Furthermore, the educational program of pharmacological osteoarthritis treatment was effective and improved elderly's knowledge of both groups.

Recommendations

Based on the results of the present study the following recommendations were suggested:

- Foot reflexology technique should be recommended in hospital protocols beside pharmacological treatment for management of osteoarthritis.
- Incorporate the foot reflexology in gerontological nursing curriculum of undergraduate students.
- Continuous health education program about pharmacological treatment of

osteoarthritis should be applied to elderly in the different community settings to improve their knowledge that affect their quality of life.

- Continuous evaluation of elderly's knowledge for enhancing compliance with pharmacological treatment of osteoarthritis is urgent need.

References

١. Clynes M, Jameson K, Edwards M, Cooper C, Dennison E. Impact of Osteoarthritis on Activities of Daily Living: Does Joint Site Matter? Aging Clinical and Experimental Research . ٢٠١٩; ٣١: ١٠٤٩-١٠٥٦.
٢. Prince J, Wu F, Guo Y. The Burden of Disease in Older People and Implications for Health Policy and Practice. Lancet Journal. ٢٠١٥: ٣٨٥:٥٤٩-٥٦٢.
٣. Centers for Disease Control and Prevention (CDC). A National Public Health Agenda for Osteoarthritis: ٢٠٢٠ Update. Arthritis Foundation. ٢٠٢٠. Available at: <https://www.cdc.gov/arthritis/osteoa> rthritis. Accessed on May ٢٠٢٠.
٤. Loeser R. The Role of Aging in the Development of Osteoarthritis. Transactions of The American Clinical and Climatological Association. ٢٠١٧; ١٢٨: ٤٤-٥٤.
٥. Valdes M, Stock J. Osteoarthritis and Ageing. Emergency Medical Journal. ٢٠١٨; ٣(١):١١٦-١٢٣.
٦. Driban J, Harkey M, Liu S. Osteoarthritis and Aging: Young Adults with Osteoarthritis. Current Epidemiology Report. ٢٠٢٠: ٧, ٩-١٥. Available at: <https://doi.org>. Accessed on March ٢٠٢٠.
٧. Magnusson K, Turkiewicz A, Englund M. Nature Vs Nurture in Knee Osteoarthritis with the Importance of Age, Sex and Body Mass Index. Osteoarthritis Cartilage Journal. ٢٠١٩; ٢٧(٤):٥٨٦-٥٩٢.
٨. Alkuwaity KH, Mohammad T, Hussain M, Alkhanani A. Prevalence and Determinant Factors of Osteoarthritis of the Knee Joint among Elderly in Arar, KSA. Egyptian Journal of Hospital Medicine. ٢٠١٨; ٧٢(٩):٥١٧٣-٥١٧٧.
٩. Xie Dinglu L, Xiaonan J. Quality of Life of Older People with Osteoarthritis. A Descriptive Literature Review. Lishui University, bachelor's degree. China. ٢٠٢٠: ٤-٣٣.
١٠. Bramble L. Physical Activity in Adults with Knee Osteoarthritis. PhD Thesis. Columbia University. Ch. (١). ٢٠١٩: ١-٧.

11. Palo N, Singh Chandel S, Arora G, Kumar M, Biswal M. Effects of Osteoarthritis on Quality of life in Elderly Population of Bhubaneswar, India. A Prospective Multicenter Screening and Therapeutic Study of 2804 Patients. Geriatric Orthopedic Surgical Rehabilitation. 2015; 6(4): 269-275.
12. Prabipoo K, Roojanavech S, Nimit-Arnun N. The Effects of Symptom Management Program on Disease Severity and Self-Care Behavior of the Elderly People with Risk of Primary Knee Osteoarthritis. Journal of Nurse Health Science. 2020; 14(1):1-13.
13. Pelletier J, Maheu E, Pelletier J, Reginster J, Rannou F. A New Decision Tree For Diagnosis of Osteoarthritis in Primary Care: International Consensus of Experts. Aging Clinical & Experimental Research Journal. 2019; 31(1):19-30.
14. Collins N, Hart H, Mills K. Osteoarthritis Year in Review 2018: Rehabilitation and Outcomes. Osteoarthritis Cartilage Journal. 2019; 27(3):378-391.
15. Alrushud A, Rushton A, Bhogal G, Pressdee F. Effect of A Combined Program of Dietary Restriction and Physical Activity on the Physical Function and Body Composition of Obese Middle-Aged and Older Adults with Knee OA (DRPA): Protocol For A Feasibility Study. British Medical Journal Open. 2018; 8(12): 1-10.
16. Bakir E, Baglama S, Gursoy S. The Effects of Reflexology on Pain and Deprivation in Patients with Rheumatoid Arthritis: A Randomized Controlled Trial. Complementary Therapies in Clinical Practice. 2018; 31:310-319.
17. Babadi M, Nazri F, Abdoli S. The Effect of Reflexology on Pain Perception Aspects in Nurses with Chronic Low Back Pain in Isfahan. Iran Journal of Nurse Midwifery Research. 2016; 21(5): 487-492.
18. Sharifi S, Navidian A, Jahantigh M, Lori A. Investigating The Impact of Foot Reflexology on Severity of Fatigue in Patients Undergoing Hemodialysis: A Clinical Trial Study. Medical Surgical Nursing Journal. 2018; 7(1):1-5.
19. Department of Health. Dietary Guidelines for Taiwan, 2011. Available at: <http://www.fda.gov.tw/news>. Accessed on June 2018.
20. Jung K, Kimm H, Eun Yun J. Thigh Circumference and Diabetes: Obesity

- as a Potential Effect Modifier. Journal of Epidemiology. ٢٠١٣; ٢٢(٥): ٣٢٩–٣٣٦.
٢١. Bellamy N. WOMAC Osteoarthritis Index User Guide. Version VII. Centre of National Research on Disability and Rehabilitation Medicine (CONROD). Brisbane, Australia. Journal of Clinical Epidemiology. ٢٠٠٥:١-١٨.
٢٢. McHorney C, Ware J, Sherbourne C. The MOS ٣٦-Item Short-Form Health Survey (SF-٣٦): Tests of Data Quality, Scaling Assumptions and Reliability Across Diverse Patient Groups. Medical Care. Journal ١٩٩٢; ٣٢(٤):٤٠-٦.
٢٣. Kaur R, Ghosh A, Singh A. Center of Public Health Chandigarh. Prevalence of Knee Osteoarthritis and Its Determinants in ٣٠-٦٠ Years Old Women of Gurdaspur, Punjab. International Journal of Medical Science and Public Health. India. ٢٠١٩; ٧(١٠): ٨٢٥-٨٣٠.
٢٤. Afifi A, Shaat R, Gharbia O, El-Eshmawy M. Osteoarthritis of Knee Joint in Metabolic Syndrome. Egyptian Society of Joints and Arthritis Diseases. Clinical Rheumatology Journal. ٢٠١٩; ٣٧(١٠): ٢٨٥٥-٢٨٦١.
٢٥. Łęgosz A, Sarzyńska S, PulikL, Kotrych L, Małydk P. The Complexity of Molecular Processes in Osteoarthritis of The Knee Joint. Open Medicine Journal. ٢٠٢٠; ١٥: ٣٦٦-٣٧٥.
٢٦. Abdel-Mohsen N, Ibrahim N, Mohamed L, Ismail N. Assessment of Physical Functional Status Among Patients with Hip Osteoarthritis. Medical Journal. ٢٠١٨; ٨٦(٦): ٣٠٥٠-٣٠٦٢.
٢٧. Taheri A, Salahshour N, SajadiM. Comparing The Effect of Foot and Hand Reflexology on Pain Severity After Appendectomy: A Randomized Clinical Trial. Iranian Journal of Nursing and Midwifery Research. ٢٠١٩; ٢٤(٦): ٤٥١-٤٥٦.
٢٨. Abdelaziz Kh, Botla F, Ebrahim H, Gab A. Effect of Reflexology on Knee Osteoarthritis Patients: A Randomized Clinical Trial. World Journal Sport Science. ٢٠١٩; ١٤(١): ٢١-٢٧.
٢٩. Khan M. Management of Osteoarthritis of The Knee in Younger Patients. Canadian Medical Association Journal. ٢٠١٨; ١٩٠(٣): ٧٢-٧٩.
٣٠. Lee J, Hong D, Yunsoo Soh A, Yang M, Min Choi K, Won CH. Relationship Between Obesity and Balance in the Community-Dwelling Elderly Population: A Cross-Sectional Analysis. American Journal of Physical

Medicine & Rehabilitation. ٢٠٢٠;
٩٩(١):٦٥-٧٠.

٣١. Barot M. Reflexology: Benefits and Limitations. Knoxville Reflexology Group Inc. ٢٠١٩. Available at: <https://knoxvillereflexology.com>. Accessed in September ٢٠١٩.

٣٢. American College of Rheumatology. Arthritis Foundation Guideline for The Management of Osteoarthritis of the Hand, Hip and Knee. ٢٠٢٠; ٧٢(٢): ٢٢٠-٢٣٣.

٣٣. Khachiana A, Seyedoshohadaeia M , Haghanib H, Amiria.F. Effect of Self-Management Program on Outcome of Adult Knee Osteoarthritis ; International Journal of Orthopedics and Trauma Nursing; ٢٠٢٠;٣٩:١٠٠-٢٩٧.

٣٤. Gay C, Guiguet-Auclair C, Pereira B, Goldstein A, Bareyre L, Coste N, Coudeyre E. Efficacy of Self-Management Exercise Program With Spa Therapy For Behavioral Management of Knee Osteoarthritis: Research Protocol For A Quasi-Randomized Controlled Trial (GEET One). BMC Complementary Alternative Medicine Journal. ٢٠١٨; ١٨(١):٢٧٩.

The Effect of Premenstrual Syndrome among Adolescent Nursing Female Students on Their Quality of Life

Fatma El-Sayed Soliman^١, Hanan Abo El-Gamelen Ebrahim Essa^٢ and Amira A. Elbially^٣

^١Assistant Professor of Community Health Nursing, Faculty of Nursing , Tanta University, Egypt

^٢Professor of Community Health Nursing, , Faculty of Nursing , Tanta University, Egypt

^٣Lecturer Professor of Community Health Nursing, , Faculty of Nursing , Tanta University, Egypt

Abstract

Background: Premenstrual syndrome (PMS) may adversely affect physical and social activities of women's lives and their quality of life (QOL). Thus, understanding health-related QOL of adolescent nursing females affected with PMS is so more essential. **Aim:** to assess the effect of premenstrual syndrome among adolescent nursing female students on their quality of life. **Design:** A descriptive research design. **Setting:** This study was conducted at Faculty of Nursing, Tanta University. **Subjects:** A convenience sample of ٤٤٦ female nursing students was taken from the first and second academic grades at the academic year ٢٠١٩-٢٠٢٠. **Tools:** Two tools were used. **Tool I:** An assessment questionnaire sheet: It consisted of two parts as follows: Part (١): Bio- socio demographic characteristics of female nursing students: A) Socio-demographic characteristics of female students and B) Menstrual history of female students. Part (٢): Personal experience of the female students regarding premenstrual syndrome. **Tool II:** WHO Quality Of Life (WHOQOL-BREF) questionnaire. **Results:** More than two thirds of the studied females mentioned that they were previously complained of PMS while less than one third of them had no previous PMS. Most of them had poor QOL as a result of PMS. **Conclusion:** Negative highly significant correlations were found between the studied females' QOL and their total level of PMS. **Recommendations:** Health education programs about PMS and its coping behaviors should be conducted for adolescent and nursing female students to improve their QOL. **Key words:** Adolescent Female, PMS, quality of life and nursing students.

Introduction

Adolescence is the period of rapid physical growth, psychological and social changes. This period is marked by the onset of menarche in the girls. Menstruation is a natural biological process experienced by all adolescent girls and women in reproductive age. Menstrual health has a close link with women's fecundity and other reproductive health risks.^(١,٢)

Pre-menstrual syndrome (PMS) is defined by a variety of physical, behavioral, and emotional or psychological symptoms that occur during the luteal phase of the menstrual cycle and experienced around the time of menstrual flow (begin a few days before menstruation and last for a few days after it).^(٣-٥) Premenstrual dysphoric disorder (PMDD) is a severe form of PMS and recurs for at least two menstrual cycles.^(٦) Premenstrual dysphoric disorder is a severe form of premenstrual physical and psychological discomfort. The disorder is common and has a negative impact on mental health and quality of life of women suffering from PMDD.^(٦, ٧) Although the etiology of PMDD is unknown, the symptoms of dysphoria, including depression and anxiety, have been

associated with serotonergic dysregulation.^(٨)

Pre-menstrual Syndrome (PMS) is a cyclic recurrence of group of symptoms. Emerging of these symptoms during young age can complicate their interpersonal relationship, social and educational performance in a negative way resulting in poor self-esteem and sense of dissatisfaction and inadequacy.^(٩-١١) Some of the physical symptoms are breast enlargement and sensitivity, edema, weight gain, headache, and fatigue. In addition, anxiety, irritability, mood swings and changes in appetite.^(١٢, ١٣)

Premenstrual Syndrome is a common psychosomatic disorder. About ٣٠%-٥٠% of women in the childbearing age suffer from mild to moderate form of this disorder and ٣%-٨% suffer from its severe form.^(١٤) The global prevalence of PMS varies from ٧٥ to ٨٥ %.^(٥) The prevalence of PMS found in a study of college students to be ١٨,٤ %.^(١٥) Another study of medical students found that ٣٧% of participants had premenstrual dysphoric disorder (PMDD).^(١٦) The symptoms' devastating effect on these crucial years of life can result in a sense of dissatisfaction and inadequacy.^(١٤)

There is no consensus regarding the diagnostic criteria for PMS because of the subjectivity of many symptoms, the use of self-reports, and the interference of psychological components as well as the lack of specific tests that confirm its diagnosis. Thus, it has been suggested that the American College of Obstetricians and Gynecologists' criteria are used for diagnosis.^(٥)

Mild PMS is characterized by up to three physical or emotional symptoms, which are sometimes not perceived by women as being PMS. The most severe form of PMS, PMDD, which is characterized by more severe symptoms that are, associated with psychological dominance and intense mood swings, which may exacerbate and/or weaken the existing symptoms.^(٥, ١٧)

The etiology of PMS is multifactorial, and it may be influenced by hormonal, genetic, environmental, and socio cultural factors. Hormonal changes may underlie these symptoms which can lead to difficulties in day-to-day functioning and poor quality of life. Other factors related to the menstrual cycle may contribute to the manifestation of PMS, such as the age of menarche, menstrual flow, and other menstruation disturbances.^(٥, ١٨, ١٩)

Another factors associated with PMS found in university students are dietary factors such as consumption of fast food, drinks containing sugar, deep-fried foods and lifestyle factors such as less habitual exercise and poor sleep quality are found to be significantly associated with PMS.^(٢٠)

Premenstrual syndrome is associated with a decline in the quality of life. Women with PMS/PMDD have impairment in physical, and also dysfunctions in occupational and social domains.^(٤, ٢١) Premenstrual syndrome may adversely affect physical functioning, social activities, psychological health of women's lives and work productivity which interfere with their interpersonal relationships and consequently influencing their quality of life.^(٥, ١٩) So, the community health nurse has an important role in addressing the problem of PMS in adolescent females and its effects on their quality of life.

Significance of the study

Understanding health-related quality of life from the perspective of the affected adolescents with PMS is essential to support them and to develop the appropriate interventions to improve their quality of life.^(١٩) Therefore, there is a need to study the quality of life of women

with PMS especially in the adolescents and colleague students.

Aim of the stud

Is to assess the effect of premenstrual syndrome among adolescent nursing female students on their quality of life

Subjects and Method

Subjects

Study design

Descriptive cross sectional study design was utilized in this study.

Setting

This study was conducted at Faculty of Nursing, Tanta University, Egypt.

Subjects

A convenient sample of ٤٤٦ female nursing students was selected from the first and second academic grades at the academic year ٢٠١٩-٢٠٢٠ from faculty of nursing, Tanta University. These two grades were specifically chosen to avoid the studied students to be affected with the related knowledge which they will study in the courses of further academic years as in obstetric and gynecology.

The total sample size was calculated using the equation of power analysis. The level of significance was determined at ٩٥% with study power not less than ٨٠%. The sample

size was calculated to be not less than ٤٠٠ students. Then the researchers increased the number to gain more validity of the results of the collected data.

Tools of data collection

Two tools were used in order to collect the necessary data for this study:

Tool I:- An assessment questionnaire sheet of female nursing students:

It was developed by the researchers based on the related literatures and consisted of two parts as following:

Part (١): Bio- socio demographic characteristics of female nursing students:-

It included:

A- Socio- demographic characteristics of female nursing students: such as age, academic grade, residence, number of female siblings and birth order.

B- Menstrual history of female nursing students: it includes data such as age of menarche, regularity of period, effect of stress on her period, past experience of premenstrual symptoms, types of premenstrual symptoms, frequency of PMS and taking medications for PMS.

Part (٢):- Personal experience of the female nursing students regarding premenstrual syndrome:

The premenstrual syndrome scale was used to collect the data for this part. The researchers were reassured to use this scale after testing its validity and reliability by Srinivasagam in 2014⁽²²⁾. The scale comprised from 40 questions distributed on three sub-scales as follows: [physiological symptoms (16 questions), psychological symptoms (12 questions) and behavioral symptoms (12 questions). Each student circled the number that most closely describes the intensity of premenstrual symptoms of her cycle. These symptoms that would occur seven days before her period and ends about the time bleeding started. Each item (question) of this scale was rated from (1) which indicated no symptoms to (5) which indicated extreme symptoms.

Scoring system

A 5-point Likert- type scale was used for rating the 40 items (questions) of this scale as follows:

Never was scored as “1”, rarely as “2”, sometimes as “3”, much as “4” and too much as “5” points. The total score for each three sub-scales was submitted. The highest degree indicated the highest level of severity of PMS.

In addition, the total score of the all scale (40 questions) were submitted which ranged from (40 – 200) and its scores' percentages were categorized into the levels of premenstrual symptoms as follows:

- **No symptoms:** (40 - < 72)
- **Mild symptoms:** only slightly apparent (72 - < 104)
- **Moderate symptoms:** aware of symptom, but it doesn't affect daily activity at all (104 - < 136)
- **Severe:** continuously bothered by symptoms (136 - < 168)
- **Very severe:** symptom is overwhelming and /or interferes with daily activity (168 - 200)

Tool II:- WHO Quality Of Life (WHOQOL-BREF)⁽²³⁾ questionnaire for female nursing students:

The WHOQOL-BREF is a shorter version of the WHOQOL-100. It was developed by the World Health Organization (WHO) and published in 1995. It was developed over several years and from 10 centers around the world. The questions stem from multiple statements about quality of life, health and well-being from people with and without disease, and

health professionals. It has been tested for reliability and validity.

The WHOQOL-BREF is a self-administered questionnaire comprising ٢٦ questions on the individual's perceptions of their health and well-being over the previous two months. Responses to questions are on a ١-٥ Likert scale where ١ represents "disagree" or "not at all" and ٥ represents "completely agree" or "extremely".

Scoring system

A ٥-point Likert-type scale was used ranging from ١ which indicates "not satisfied or not at all" to ٥ which indicates "completely agree or very satisfied". The scores of all items are summed up to calculate total score of the quality of life (QOL) of the studied nursing students, and then classified into three categories as following:

- **Poor QOL:** < ٦٠ % of the total score
- **Fair QOL:** ٦٠ % – ٧٥ % of the total score
- **Good QOL:** > ٧٥ % of the total score

Method

The operation of this study was carried out as follows:-

١- Administrative process (obtaining approval)

An official permission to conduct this study was obtained from the responsible authority of Faculty of Nursing and its ethical committee. This is to gain the permission and cooperation to collect the needed data for this study.

٢- Ethical and legal considerations

- An informed consent was obtained from all study subjects after providing appropriate explanation about the purpose of the study.
- Each participant was informed that she had the right to withdraw from the study at any time she wants.
- Nature of the study did not cause any harm or pain for the entire sample.
- Confidentiality and privacy were put into consideration regarding the collected data.

٣- Developing the tools

- The study tool ١ (part ١) was developed by the researcher based on literature review.
- Tool I (part ٢) was adopted from the premenstrual syndrome scale. ^(٢٢)
- Tool II was adopted from WHO Quality Of Life (WHOQOL-BREF) questionnaire. ^(٢٣)
- The study tools were tested for its face and content validity by five experts in the field of community health nursing.
- The study tools were tested also for its reliability by using Chronabach's alpha test. It was computed and found to be

0.83 for the total sheet while it was 0.91 for the personal experience of the female nursing students regarding premenstrual syndrome scale and it was 0.99 for the quality of life scale.

4- The pilot study

A pilot study was carried out by the researcher on 10% of the subjects (40 students) for testing the tools for its clarity, applicability and to identify obstacles that may be encountered with the researcher during data collection. Accordingly, the necessary modifications were done where some questions were omitted and others were paraphrased. So, those students were excluded from the actual study sample.

5- The actual study

- The data were collected by the researchers over a period of 3 months starting from first of October to the end of December 2019.
- The researchers introduced themselves to the female nursing students and explained the purpose and importance of the study.
- Anonymity and confidentiality of the female students' information were considered and emphasized at the beginning of the interview. This helped to gain their cooperation.

- The questionnaire was given to each student to fill it individually.
- The average time spent for collecting data from each student was approximately 20-25 minutes.

6- Statistical analysis

The collected data were coded, organized, tabulated and statistically analyzed using (Statistical Package for Social Studies) SPSS version 19. For numerical values the range mean and standard deviations were calculated. For categorical variable the number and percentage were calculated and differences between subcategories were tested by chi square test. The correlation between two variables was calculated using Pearson's correlation coefficient. The level of significant was adopted at $p < 0.05$.

Results

Table (1): Shows distribution of socio-demographic characteristics of the studied nursing female students. It was found that the age of less than two thirds (66.9%) of the studied nursing females students was less than 20 years old. Their ages ranged between 18-21 years with a mean age of 18.92 ± 1.04 years. More than half (50.4 % and 50.9 %) of them

were in the 2nd grade and from urban residence respectively.

Regarding the number of their female siblings, less than one third (31.4 %) of the studied females had one sister, more than one quarter (29.8 %) of them had two sisters and more than one fifth (21.0 % and 21.3 %) of them either had no sisters or had three sisters or more respectively. Concerning the birth order of the studied female students, the table revealed that less than two fifths (38.6 % and 37 %) of them were the oldest or the middle sister respectively while less than one quarter (24.4 %) of them were the last or youngest sister.

Table (2): Demonstrates the distribution of the studied nursing female students according to their menstrual history.

More than three quarters (76.0 %) of the studied female students had their menarche between the ages of 12-15 years. More than one half (50.2 %) of them had a nearly regular period while more than one quarter (29.6 %) of them had completely irregular period.

As regard to the effect of stress on the studied females' period, the table revealed that more than two thirds (70.9 %) of the studied females mentioned that stress

affecting their period. Concerning the previous premenstrual symptoms, more than two thirds (68.8 %) of the studied females mentioned that they were previously complained of PMS while less than one third (31.2 %) of them had no previous PMS.

The most prevalent complain was colic which was experienced by more than one quarter of the studied females followed by muscle pain which experienced by less than one quarter of them (26.7 % and 23.2 %) respectively. However, less than one half (47.0 %) of the studied females mentioned that they were experienced PMS monthly.

Table (3): Shows the distribution of the studied nursing female students according to their total level of physiological, psychological and behavioral premenstrual symptoms. It was obvious that more than one third (30% and 36.8%) of the studied female students had experienced severe physiological and psychological premenstrual symptoms respectively and more than one fifth (21.1%) of them had severe behavioral symptoms. Meanwhile, nearly about half (50.2% and 48.4%) of the studied students had moderate behavioral and physiological

symptoms respectively. Additionally, more than one third (38,1%) of them had moderate psychological symptoms. About one quarter (25,1%) of them had mild behavioral symptoms.

Figure (1): Shows the distribution of the studied female students according to their total level of PMS. It illustrated that more than half (53,4%) of the studied female students had moderate level of PMS. More than one third (34,3%) of them had severe level of PMS and only 11,2 % of the studied females had mild level of PMS.

Figure (2): Shows the distribution of the studied female students according to their total level of quality of life related to PMS. It illustrated that less than two thirds (60,0%) of the studied female students had poor quality of life as a result of PMS. More than one third (38,8%) of them had fair level of quality of life. Only 1,2 % of them had good level of quality of life related to PMS.

Table (4): Presents the correlation between female' socio-demographic characteristics and menstrual history and their PMS and QOL. There was positive highly significant correlation between the age of the studied female

students and their experience of PMS ($r = .219$ & $p = < .001$). While, negative significant correlation was found between residence of the studied students and PMS ($r = -.114$ & $P = .,016$). Meanwhile, negative significant correlation was observed between birth order of the studied females and their quality of life ($r = -.120$ & $p = .,011$). Negative highly significant correlation was found between the regularity of the students' period and the total level of their PMS ($r = -.200$ & $P = < .001$). The table also showed that, negative significant correlation was observed between level of QOL and students' age of menarche ($r = -.106$ & $P = .,020$) while, the level of QOL was significantly and positively correlated to the regularity of their period ($r = .112$ & $P = .,018$).

Table (5): Illustrates the correlation between nursing female students' PMS and their QOL. It was clear that negative highly significant correlations were found between the studied females' quality of life and their physiological, psychological and behavioral symptoms of the total level of PMS ($P = .,002$, $.,001$, $< .001$ and $< .001$) respectively.

Table (١): Distribution of the studied nursing female students according to their socio-demographic characteristics (N= ٤٤٦)

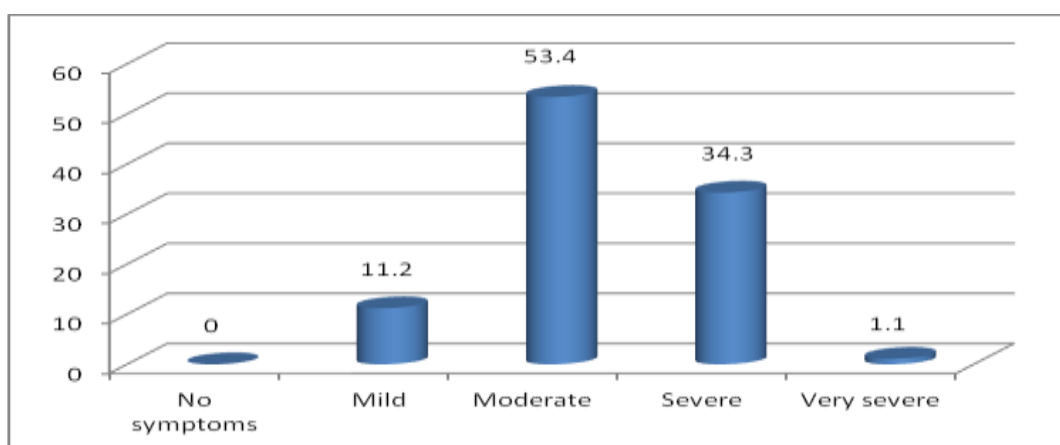
Socio-demographic characteristics	(N= ٤٤٦)	%
Age: <ul style="list-style-type: none"> < ٢٠ years ≥ ٢٠ years 	٢٧٦ ١٧٠	٦١,٩ ٣٨,١
Average ١٨-٢١ Mean ± SD ١٨,٩٢±١,٠٤		
Academic grade: <ul style="list-style-type: none"> ١st Grade ٢nd Grade 	١٩٩ ٢٤٧	٤٤,٦ ٥٥,٤
Residence: <ul style="list-style-type: none"> Rural Urban 	٢١٩ ٢٢٧	٤٩,١ ٥٠,٩
Number of female siblings: <ul style="list-style-type: none"> Have no sisters one sister Two sisters Three sisters or more 	٩٦ ١٤٠ ١١٥ ٩٥	٢١,٥ ٣١,٤ ٢٥,٨ ٢١,٣
Average ٠-٣		
Birth order <ul style="list-style-type: none"> The first The middle The last 	١٧٢ ١٦٥ ١٠٩	٣٨,٦ ٣٧ ٢٤,٤

Table (٢): Distribution of the studied nursing female students according to their menstrual history (N= ٤٤٦)

Menstrual data	(N= ٤٤٦)	%
Age of menarche:		
• < ١٢ years	٧٤	١٦,٥
• ١٢ – ١٥ years	٣٤١	٧٦,٥
• > ١٥ years	٣١	٧
Regularity of the period:		
• Completely irregular	١١٤	٢٥,٦
• Nearly regular	٢٢٤	٥٠,٢
• Regular	٩٥	٢١,٣
• Completely regular	١٣	٢,٩
Effect of stress on your periods:		
• No	١٣٠	٢٩,١
• Yes	٣١٦	٧٠,٩
Past experience of premenstrual symptoms:		
• No	١٣٩	٣١,٢
• Yes	٣٠٧	٦٨,٨
Types of premenstrual symptoms:		
• No symptoms	١٣٩	٣١,٢
• Colic	١١٩	٢٦,٧
• Vomiting	٥٥	١٢,٣
• Fever	٢٩	٦,٥
• Muscle pain	١٠٤	٢٣,٣
Frequency of PMS:		
• don't know	٤٣	٩,٦
• Never	٩٦	٢١,٥
• Twice in her life	٧	١,٦
• Twice per year	١٠	٢,٢
• Every two months	٧٨	١٧,٥
• Monthly	٢١٢	٤٧,٥
Taking medications for PMS:		
• No	٣٣٣	٧٤,٧
• Yes	١١٣	٢٥,٣

Table (٣): Distribution of the studied nursing female students according to their total level of physiological, psychological and behavioral PMS (N= ٤٤٦)

Total levels of PMS	Physiological PMS		Psychological PMS		Behavioral PMS	
	No	%	No	%	No	%
No symptoms	٠	٠,٠	٠	٠,٠	٦	١,٤
Mild symptoms	٦٨	١٥,٢	٧٠	١٥,٧	١١٢	٢٥,١
Moderate symptoms	٢١٦	٤٨,٤	١٧٠	٣٨,١	٢٢٤	٥٠,٢
Severe symptoms	١٥٦	٣٥,٠	١٦٤	٣٦,٨	٩٤	٢١,١
Very severe symptoms	٦	١,٤	٤٢	٩,٤	١٠	٢,٢

**Figure (١): Distribution of the studied female nursing students according to their total level of PMS**

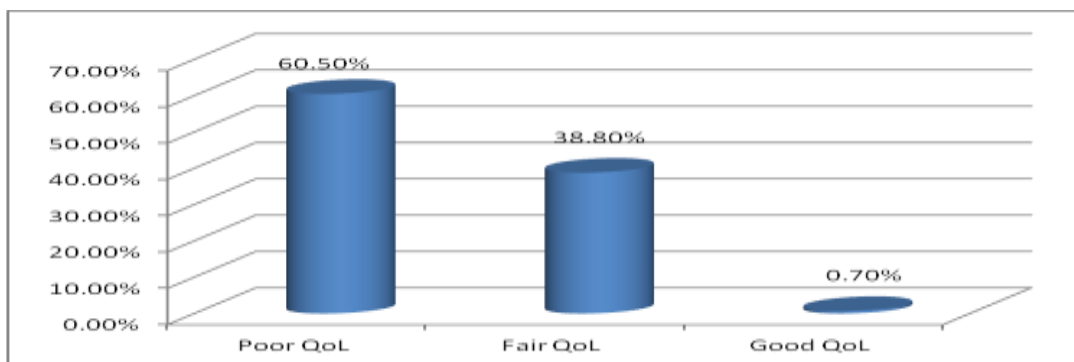


Figure (٢): Distribution of the studied nursing female students according to their total level of quality of life related to PMS

Table (٤): Correlation between female' socio-demographic characteristics and menstrual history and their PMS and QOL

Socio-demographic data	PMS		QOL	
	R	P	R	p
Age	.٢١٩	<.٠٠١**	.٠٣٩	.٤١٠
Residence	-.١١٤	.٠١٦*	-.٠٥٤	.٢٥٨
Birth order	-.٠٢١	.٦٦٦	-.١٢٠	.٠١١*
Age of menarche	-.٠٢٥	.٦٠٤	-.١٠٦	.٠٢٥*
Regularity of period	-.٢٠٥	<.٠٠١**	.١١٢	.٠١٨*

*Significant at $p < .05$

**High Significant at $p < .001$

Table (٥): Correlation between nursing female students' PMS and their QOL

Females' PMS	females' QOL	
	R	P
Physiological symptoms	-.١٤٤	.٠٠٢**
Psychological symptoms	-.١٥٦	.٠٠١**
Behavioral symptoms	-.١٨٣	<.٠٠١**
Total PMS	-.١٦٨	<.٠٠١**

** Highly Significant at $p < .001$

Discussion

Menstruation is the hall mark of every girl. Menstrual cycle is an inevitable part of a woman's life and an important indicator of normal sexual and reproductive health^(1, 2). The present study indicated that the age of 61.9% of the studied females was less than 20 years old. Their ages ranged between 18-21 years and half of them were from urban area. This is consistent with the results of the study conducted by **(K. BHUVANESWARI et al., 2019)**, which indicated that, majority of students who participated in the study were between 18 and 22 years of age and 93% of them were from urban areas.⁽³⁾ Moreover, **(Karpagavalli G and Raj Rani, 2020)**, found that 94.3% of the studied students were between 18 and 22 years. This may be as the current study was conducted on the students in the first and second grades only.⁽⁴⁾

Menarche is a milestone in a woman's life as it denotes the start of reproductive capacity. Attainment of menarche at correct age is an important milestone during adolescence, which signifies the normal functioning of the female reproductive system.^(1, 2) According to the current study, more than three quarters of

the studied female students had their menarche between the ages of 12-15 years. This is in line with the study conducted by **(K. BHUVANESWARI et al., 2019)**, in which the age of menarche for the majority of the studied students in their study was ranged from 12-15 years.⁽³⁾ Additionally, it is similar to the results of the study carried out by **(Abdel Hafez et al., 2015)**, in Nursing College at EL- Minia University, which found that most of the students their menarche age ranged from 13 to 15 years.⁽⁵⁾

Regarding regularity of period and stress, the present study revealed that more than one quarter of the students had completely irregular period and most of the students had stress during the period. This is in line with the study conducted in Saudi Arabia by **(Aljebali S S and Alofi L, 2020)**, which found that nearly two fifths of the participants were found to experienced irregular menstrual cycles and 82.5% of them suffered from mood swings or nervousness.⁽⁶⁾ On the other hand, it contradicts with the studies conducted by **(Chhetri and Singh, 2020)**⁽⁷⁾ and **(Koganti CT and Bobba NS, 2020)**,⁽⁸⁾ both revealed that the majority of the

participants have irregular periods. This regularity of period may be associated with hormonal and environmental changes. As well, the high stress numbers may be attributed to nature of those students' study and life which filled of more assignments and activities in addition to hormonal ef Premenstrual syndrome (PMS) refers to a set of distressing symptoms experienced around the time of menstrual flow. ^(٢٥) The present study revealed that more than two thirds of the studied females mentioned that they were previously complained of PMS. This is consistent with the study done by **(Al-Batanony MA and Al-Nohair SF, ٢٠١٤)** in Al Qassim university among medical students, which showed a prevalence of ٧٨,٥% the prevalence of PMS ^(٢٨) and **(Karpagavalli G and Raj Rani ٢٠٢٠)**, who reported that the prevalence of PMS was ٦٨, ٨% among college students of a nursing college at Chennai. ^(٢٤) While contradicts with **(Tolossa FW, Bekele ML, ٢٠١٤)**, who found that the prevalence of PMS was ٣٧% among students (women) in a college of health sciences in Northern Ethiopia. ^(٢٩) This difference may be related to many factors where the occurrence of PMS is influenced by hormonal, genetic, environmental, and

socio cultural factors as well as dietary habits of university students.

Premenstrual syndrome (PMS) is considered a broad range of physical, emotional, and behavioral symptoms. ^(٣٠) According to the present study, the highest percentages of the studied female students had moderate level of physiological, psychological and behavioral PMS symptoms. Meanwhile, the lowest percentages of them had very sever level of PMS symptoms. Conversely, the study conducted by **(kumari S and Sachdeva A, ٢٠١٦)**, in India revealed that most of the studied women suffer only a few of PMS symptoms. ^(٣١) This may be attributed to cultural differences between countries in which these studies are conducted.

Regarding the level of PMS, the current study illustrated that more than half of the studied female students had moderate level of PMS. More than one third of them had severe level of PMS and only ١١,٢ % of the studied females had mild level of PMS. This is agrees with **(Seedhom et al., ٢٠١٣)**, who were found that, the most participants had moderate PMS (٦٤,٨%) followed by mild PMS (٢١,٧%), and finally severe PMS (١٣,٤%). ^(٣٢) Similarly,

(Mohamed et al., 2013), reported that, 49.0% of their study subjects had moderate degree of PMS, 27.0% had mild degree of PMS, and 24.0% had severe degree of PMS. ⁽³³⁾ Moreover, (Ibrahim et al., 2012), their study findings were revealed that, (29.0%, 33.9%, & 36.6%) of students had mild, moderate, and severe degree of PMS respectively at initial assessment. ⁽³⁴⁾ On the other hand, it disagrees with (Nageeb H et al., 2015), who found that 00.8% of the studied nursing students in Dakahlia governorate had mild PMS, 34.2% of them had moderate PMS and only 0.4 % had sever PMS. ⁽³⁵⁾ This difference may be related to individual variations and changes in the symptoms threshold from person to person. The present study illustrated that less than two thirds (60.0%) of the studied female students had poor quality of life as a result of PMS. More than one third (38.8%) of them had fair level of quality of life. Only 0.9 % of them had good level of quality of life related to PMS. This is similar to (Karpagavalli G and Raj Rani 2020) ⁽³⁶⁾ and (K Bhuvaneswari 2019), ⁽³⁷⁾ who found poor quality of life among students with PMS across all domains. Conversely, This is not consistent with the results of (Elgar WT

and Sayed SH, 2017), who found that 86% of college students with PMS had fair quality of life, while only 4% of them had good quality of life and 12% had poor quality of life. ⁽³⁸⁾ This can be explained as this study was conducted in five colleges out of ten -Damanhur University (College of Science, Art, Nursing, Education and Social Work college), Elbehira governorate while the current study is conducted on nursing students only. This may be also due to high prevalence of PMS among the students in the current study.

The present study illustrated positive highly significant correlation between the age of the studied female students, and their experience of PMS. While, negative significant correlation was found between residence of the studied students and PMS. In contrast, (Koganti CT and Bobba NS, 2020), found that, there was no statistically significant association between PMS and all socio-demographic characteristics. ⁽³⁹⁾ In the current study, negative highly significant correlation was found between the regularity of the students' period and the total level of their PMS. This is similar with (Shiferaw et al., 2014), who reported that, students who had irregular

menstruation were 1.87 times more likely to have PMS compared to students who had regular menstruation.⁽³⁷⁾ This is comparable with (Nageeb H et al., 2010), who showed no statistically significant relation between duration of blood flow, menstrual interval, menstrual regularity and prevalence of PMS.⁽³⁸⁾

Moreover, the current study found no significant correlation between students' age of menarche and PMS. This is in the same line with, (Karpagavalli G and Raj Rani, 2020), who showed that, presence of dysmenorrhea and family history of PMS have been associated with PMS.⁽³⁹⁾ Otherwise, it contradicts with (Nageeb H et al., 2010), who found that there was a highly statistically significant relation between age of menarche, the amount of blood flow and PMS's prevalence.⁽³⁸⁾ In the present study, it was found that, negative highly significant correlations were found between the studied females' quality of life and their physiological, psychological and behavioral symptoms of the total level of PMS. This agrees with (Kustriyanti D and Rahayu H, 2020),⁽³⁸⁾ who reported that the quality of life among students has decreased in all

domain, physical health, psychological, social relationships and environment as well as (K.BHUVANESWARI et al., 2019),⁽³⁷⁾ and (Karpagavalli G and Raj Rani 2020),⁽³⁹⁾ who reported that PMS was associated with a poorer quality of life across all domains' In addition, ((Delara M et al. 2012),⁽³⁹⁾ affirmed the fact that adolescents with premenstrual disorders suffer from poor health-related quality of life. Moreover, (Al-Batanony MA and Al-Nohair SF, 2014), found an association of PMS with physical problems, vitality, mental health and body pain, indicating decreased quality of life.⁽³⁸⁾ These all results signified the importance of PMS of the nursing students and its relation with their quality of life.

Conclusion

Based on the findings of the present study, it can be concluded that, more than two thirds of the studied female nursing students mentioned that they were previously complained of PMS. Most of the students had poor quality of life. Additionally, negative highly significant correlations were found between the studied females' quality of life and their physiological, psychological and

behavioral symptoms of the total level of PMS.

Recommendations

Based on findings of the current study, the following recommendations can be suggested

- Conducting health education programs for adolescents and university students about PMS and its coping behaviors to improve their quality of life.
- Detecting the modifiable factors of PMS is required to decrease its effects on adolescent students.
- Suitable coping strategies should be provided to all females to diminish their suffering from PMS
- Further researches should be conducted to promote the quality of life of university students which results from PMS.

References

1. Gandotra N, Mahajan N. To study the menstrual patterns and various menstrual problems among adolescent girls. International Journal of Clinical Obstetrics and Gynecology. 2020; 4 (4): 227-229.
2. Chhetri DD, Singh MS. Menstrual characteristics among the Nepali adolescent girls. Indian Journal of Public

Health Research & Development. 2020; 11 (7): 247-253.

3. K Bhuvaneswari, Porkodi Rabindran, Balaji Bharadwaj Year. Prevalence of premenstrual syndrome and its impact on quality of life among selected college students in Puducherry. The National Medical Journal of India. 2019; 32 (1): 17-19.
4. Srivaths L V. Hematology in the adolescent female. Springer Nature Switzerland AG: Switzerland; 2020. 3-5.
5. Ahmed S, Saeed A. Knowledge and self-care practices of adolescent students with pre-menstrual syndrome in Erbil city. Erbil Journal of Nursing and Midwifery. 2019; 2 (1): 9 - 18.
6. Abdalla NO, Gibreel MS. Effects of an educational program in increasing knowledge and reducing premenstrual syndrome signs, symptoms and severity among nursing college students. KSA. International Journal of Basic and Applied Sciences. 2016; 5 (4): 200-209. **Available from:**
https://www.researchgate.net/publication/309493400_Effects_of_an_educational_program_in_increasing_knowledge_and_reducing_premenstrual_syndrome_signs_sympt

oms_and_severity_among_nursing_college_students

٧. El- Masry N, Abdelfatah N. Quality of life and burden of women with premenstrual dysphoric disorder. Egyptian Journal of Psychiatry. ٢٠٢٠; ٣٣: ٤٥- ٥٠.
٨. Vezic SS, Jukic MK, Tikvica A, Baldani DP. Diagnostic and therapeutic algorithm for the treatment of premenstrual dysphoric disorder. Acta Medica Croatica. ٢٠١٠; ٦٤:١٨٣-١٩٠.
٩. Siahbazi S, Montazeri A, Taghizadeh Z, Masoomie R. The Consequences of Ppremenstrual syndrome on the quality of life from the perspective of affected women: A qualitative study. Journal of Research in Medical and Dental Science. ٢٠١٨; ٦(٢): ٢٨٤- ٢٩٢.
١٠. Miriam S, Irantzu L. Premenstrual experience, premenstrual syndrome and dysphoric disorder in psychopathology in women incorporating gender perspective into descriptive psychopathology. Springer. ٢٠١٥; ٤٢٣-٤٤٩. [PubMed]
١١. Malhotra P Sharma S, Kaur Urvashi Rand Vanshika R. Pre-menstrual syndrome and health related quality of life among young adult females at Northern India: A Cross-Sectional Study. Clin Psychiatry Journal. ٢٠١٩; ٦: ٦٥.
١٢. Hamaideh SH, Al-Ashram SA, Al-Modallal H. Premenstrual syndrome and premenstrual dysphoric disorder among Jordanian women. J Psychiatr Ment Health Nurs. ٢٠١٤; ٢١(٠١):٦٠-٦٨. Doi: ١٠.١١١١/jpm.١٢٠٤٧.
١٣. Kuar R, Singh S and Kaushal K. Prevalence of sleep disturbances in menstrual cycle irregularities: A pilot study. International Journal of Science and Healthcare Research. ٢٠٢٠; ٥ (٣): ١١٧- ١٢٠.
١٤. Taghizadeh Z, Shirmohammadi M, Arbabi M, Mehran A. The Effect of premenstrual syndrome on quality of life in adolescent girls. Iran J Psychiatry. ٢٠٠٨; ٣:١٠٥-١٠٩.
١٥. Raval CM, Panchal BN, Tiwari DS, Vala AU, Bhatt RB. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder among college students of Bhavnagar, Gujarat. Indian J Psychiatry. ٢٠١٦; ٥٨:١٦٤-٧٠.
١٦. Mishra A, Banwari G, Yadav P. Premenstrual dysphoric disorder in medical students residing in hostel and its association with lifestyle factors. Ind Psychiatry J. ٢٠١٥; ٢٤:١٥٠-٧.
١٧. American Psychiatric Association. Depressive Disorders. In: American Psychiatric Association. Diagnostic and

- Statistical Manual of Mental Disorders: DSM-5. 5th ed. Arlington, VA: American Psychiatry Association; 2013: 948
18. American College of Obstetricians and Gynecologists. Premenstrual Syndrome. 2010. **Available from:** <https://www.acog.org/Patients/FAQs/Premenstrual-Syndrome-PMS>. Accessed July 28, 2017
 19. Maia MS, Aguiar MIF, Chaves ES, Rolim ILTP. Quality of life of women with premenstrual syndrome from the scale WHOQOLBREF. Ciênc Cuid Saúde. 2014; 13(02): 236-244. Doi: 10.4020/ciencucuidsaude.v13i2.10709
 20. Cheng SH, Shih CC, Yang YK, Chen KT, Chang YH, Yang YC, et al. Factors associated with premenstrual syndrome – A survey of new female university students. Kaohsiung J Med Sci. 2013; 29:100-5.
 21. Delara M, Ghofranipour F, Azadfallah P, Tavafian SS, Kazemnejad A, Montazeri A, et al. Health related quality of life among adolescents with premenstrual disorders: A cross sectional study. Health Qual Life Outcomes. 2012; 10:1.
 22. Validity and Reliability Study of Premenstrual Syndrome Scale (PMSS) Padmavathi P, Sankar R, Kokilavani N, Dhanapa K, Ashok B. International Journal of Advances in Nursing Management. January-March 2014; 2(1): ISSN-2347-8632
 23. The WHOQOL Group. Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment. Psychol Med. 1998; 28: 001-008. [PubMed] [Google Scholar]
 24. Karpagavalli G and Raj Rani. A Study to assess the effect of premenstrual syndrome on quality of life among college students at Chennai. International Journal of Health Sciences and Research. 2020; 10 (6): 2249-9071.
 25. Abdel Hafez A, Ahmed S, Makhoulouf E. Assessing the premenstrual syndrome and coping behavior among female nursing students. Al-Azhar Assiut Medical Journal AAMJ. 2010; 13 (4): 179.
 26. Aljebali S, Alofi L. Prevalence and determinant of premenstrual dysphoric disorder among secondary school female students, Makkah Al Mokarramah, Saudi Arabia. American Journal of Medical Sciences and Medicine. 2020; 8 (6): 208-216.
 27. Koganti C, Bobba N. A Study on the prevalence of premenstrual dysphoric

- disorder in medical students. *Academia Journal of Medicine*. 2020, 3 (1): 99. ISSN (O): 2663-8290; ISSN (P): 2663-8282
28. Al-Batanony MA, Al-Nohair SF. Prevalence of premenstrual syndrome and its impact on quality of life among university medical students, Al Qassim university, KSA. *Public Health Research*. 2014; 4 (1):1-6
29. Tolossa FW, Bekele ML. Prevalence, impacts and medical managements of premenstrual syndrome among female students: Cross-sectional study in college of health sciences, Mekelle University, Mekelle, Northern Ethiopia. *BMC Womens Health*. 2014; 14:52
30. Joseph T, Nandini M, Sabira KA. Prevalence of premenstrual syndrome (PMS) among adolescent girls. *Journal of Nursing and Health Science*. 2016; 5 (1): 24-27.
31. Kumari S, Sachdeva A. Patterns and predictors of premenstrual symptoms among females working in a psychiatry hospital. *Scientifica Journal*. 2016; 2016:1-7.
32. Seedhom A, Mohammed E, Mahfouz E. Life style factors associated with premenstrual syndrome among El-Minia University students, Egypt. *International Scholarly Research Notices*. 2013; 2013: 1-6.
33. Mohamed E H, Youssef I M, Ahmed A B, Hamied AS. Prevalence and factors affecting premenstrual syndrome in Alganaen Village Suez Governorate. *The Medical Journal of Cairo University*. 2013; 81(2): 20-28.
34. Ibrahim, R. M., Soliman, S. M., Mahmoud, H. M. Effect of vitex agnus castus (VAC) on premenstrual syndrome among nursing students. *Journal of American Science*. 2012; 8(4):144-153.
35. Nageeb H, Mohamed R, Amasha H. Prevalence of Premenstrual Syndrome: Complementary & Alternative Therapy among Nursing Students. *Journal of Nursing and Health Science*. 2010; 4 (2): 2220-1940.
36. Elgzar W, Sayed S. Quality of life among girls with or without clinically significant premenstrual syndrome. *American Journal of Nursing Science*. 2017; 6(2): 87-98.
37. Shiferaw, M. T., Wubshet, M., & Tegabu, D. Menstrual problems and associated factors among students of Bahir Dar University, Amhara National Regional State, Ethiopia: A cross-sectional survey. *Pan African Medical Journal*. 2014; 17:246. **Available from:**

<http://www.panafrican-med-journal.com/content/article/17/246/full/>

38. Kustriyanti D, Rahayu H. Prevalence of premenstrual syndrome and quality of life among health science college student. International Journal of Public Health Science (IJPHS). 2020; 9 (1): 15- 19.

Pregnant women's concerns about Coronavirus disease ٢٠١٩ (COVID-١٩) and its relationship to their preventive behaviors

Shimaa Mohamed Hashem ^١, Rania El-Kurdy ^٢, Ekbal Ebrahim Abdelmenem ^٢

^{١,٢} Lecturer of Maternal and Neonatal Health Nursing Dept, Faculty of Nursing, Tanta University, Egypt.

^٢ Lecturer of Woman's Health and Midwifery Nursing, Faculty of Nursing, Mansoura University, Egypt.

Abstract

Background: As the pandemic of COVID-١٩ is still present up to now, major concerns are being raised up about its effects on pregnancy and the potential risks of vertical transmission from the pregnant women to their fetuses. **Aim:** the present study aim to assess pregnant women's concerns about Coronavirus disease ٢٠١٩ (COVID-١٩) and its relationship to their preventive behaviors. **Subjects and methods: design:** A descriptive cross-sectional research design was used in this study. **Setting:** The study was conducted at obstetric and gynecological outpatient clinics at Tanta University hospital. **Sampling:** A convenient sample of ٢٨٤ pregnant women. **Tools of data collection:** Three tools were used for data collection. **Tool I** consisted of three parts, **part I:** Socio-demographic characteristics, **Part II:** Obstetric history, **Part III:** Women's Knowledge about Corona Virus, **Tool II:** Pregnant Women's Concerns about Corona Virus and **Tool III:** Pregnant Women's Preventive Behaviors regarding Corona Virus. **Results:** the results of the present study revealed that (٥٥,٣%) had high knowledge level, (٧٠,٤%) had high concerns about COVID-١٩ pandemic respectively, and (٥٢,٨%) of studied pregnant women's had satisfactory preventive behaviors against covid-١٩ virus. **Conclusion:** Based on the findings of the present study, it can be concluded that pregnant women's level of knowledge and concerns significantly correlated to their compliance with recommended preventive behaviors regarding COVID-١٩. **Recommendation:** The current study suggested that maternity nurses should pay more attention and reach to the lower-educated younger pregnant women especially in rural areas being a group with the least engagement in health preventive behaviors.

Key words: Corona virus, pregnant women's concerns, preventive behaviors

Introduction:

Coronavirus disease 2019 (COVID-19) is a highly infectious respiratory disease that is caused by a novel coronavirus. It is first emerged in December 2019 in Wuhan, China. However, its spreading was very quickly to affect 222 countries and territories all over the world, earning it the moniker "pandemic of the century" by the World Health Organization. The global estimates of incidence and mortality rates are rapidly changing and till December 19, 2021, COVID-19 has been confirmed in 274,004,204 people over the world, with 5,367,089 deaths. COVID-19 is often more severe among older people and people with serious underlying medical conditions, such as hypertension, diabetes, cardiovascular disease, chronic respiratory disease and weakened immune systems⁽¹⁻⁴⁾.

Pregnancy is naturally a period of immunosuppression, in order to protect fetus. Subsequently, Pregnant woman is considered among the high risk group of COVID-19 with substantially increased risk of severe pregnancy complications, including preeclampsia/eclampsia/HELLP syndrome, abortion, preterm birth, intrauterine growth restriction and low birth weight, fetal tachycardia, fetal distress, as well as intensive

care unit admission or referral to higher level of care. The risk of maternal mortality was 1.6%, i.e., 22 times higher in the group of women with COVID-19 diagnosis⁽⁵⁻⁹⁾.

Furthermore, the consequences of COVID-19 extend to affect the psychological status of pregnant women as it is considered one of the most intense emotional experiences in pregnant women's life. This contributes to a greater sense of fear, stress and anxiety. Pregnant women are expressing concerns about greater severity of COVID-19 disease in this population, their infant's safety and the potential vertical transmission from an infected mother to her newborn, increased risk of adverse neonatal outcomes, sudden changes in antenatal healthcare (e.g., modifications of scheduled appointments, restrictions on the presence of family members during childbirth and postnatal visitation), and protection methods^(10, 11-12).

Likewise, no specific treatment exists to prevent or cure this disease. Although COVID-19 vaccines are now available, it is unclear whether vaccines can prevent virus transmission. In this regard, maternity nurses should pay more attention to pregnant women who have health concerns at the same time about themselves and their fetuses. Emphasizing that exercising COVID-19

prevention measures is a crucial way in the COVID-19 pandemic's containment^(11, 12-14).

Practicing preventive measures which recommended by the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) as frequent hand washing, wearing face masks, refraining from excessive outdoor activities unless an emergency, avoiding crowded places, unnecessary journeys, public transportation, and contact with sick people, should be strictly followed by pregnant women. Importantly, they should check their temperature frequently and immediately inform their maternity-care provider if they experience shortness of breath, cough or fever and seek advice regularly⁽¹⁵⁻¹⁷⁾.

Pregnant women's adherence to these control measures is essential to prevent the spread of the disease. However, transmitting large amounts of information and overuse of the media can lead to overreaction, irrational fear, and over perception of risk, which in turn might affect pregnant women's behaviors. Psycho-behavioral surveillance is critical during communicable disease outbreaks because it affects risk awareness strategies targeting high-risk groups such as pregnant women. Measuring the level of pregnant women's concerns as an important

determinant of healthy behaviors is essential for the transmission of information and health protocols as well as in designing interventions to change behaviors in pregnant women^(1, 8, 19).

Significance of the study:

In Egypt, from 3 January 2020 to 24 November 2021, there have been 304,836 confirmed cases of COVID-19 with 20,237 deaths, reported by Egyptian Ministry of Health. COVID-19, which has now spread throughout the country, during an outbreak of infectious diseases, pregnant women and their fetuses are particularly vulnerable. Furthermore, there has only been one confirmed case of COVID-19 transplacental transfer so far. SARS is related to COVID-19 and has a 20% case fatality rate in pregnant women, as well as a variety of perinatal problems such as disseminated intravascular coagulation, kidney (renal) failure, secondary bacterial pneumonia, sepsis, and miscarriage. Additionally, mechanical ventilation is required in pregnant women who have been infected with SARS is higher than that for non-pregnant ones.⁽¹⁹⁻²¹⁾

In general, the physiological and mechanical changes that occur during pregnancy enhance infection susceptibility. Emerging infections have been demonstrated to have a major influence on pregnant women and their

fetuses, according to research. Clinical findings during pregnancy can range from moderate symptoms to severe sickness and death, according to previous data from Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) infections. Premature rupture of the membranes, preterm labor, fetal tachycardia, and fetal distress appear to be linked to COVID-١٩ infections in the third trimester of pregnancy. Besides, coronavirus pandemic causes fear, stress and anxiety for pregnant women worldwide. It is argued that without knowing the level of fear about COVID-١٩ among different groups it is difficult to know whether education and prevention programs are needed, and if they are needed which groups to target and where. So that, the identification and application of such data could be used to develop targeted education and/or prevention programs to help overcome fear of COVID-١٩ and help such individuals to engage in preventative behaviors ^(١, ٢١-٢٢).

Aim of the study:

This study aimed to assess pregnant women's concerns about Coronavirus disease ٢٠١٩ (COVID-١٩) and its relationship to their preventive behaviors.

Through the following objectives:

Assessing pregnant women's knowledge about COVID-١٩ pandemic.

Determining pregnant women's concerns about COVID-١٩ pandemic.

Appraising pregnant women's preventive behaviors regarding COVID-١٩ pandemic.

Research questions:

- a) What is pregnant women's knowledge about COVID-١٩ pandemic?
- b) What are pregnant women's concerns about COVID-١٩ pandemic?
- c) What are pregnant women's preventive behaviors regarding COVID-١٩ pandemic?
- d) Are there relation between pregnant women's knowledge, concerns, preventive behaviors and their demographic characteristics?

Subjects and methods

Study design: In this study, a descriptive cross-sectional research design was used.

Setting

The study was conducted at obstetric and gynecological outpatient clinics at Tanta University hospital.

Sampling:

According to the equation of power analysis a convenient sample was utilized to select ٢٨٤ pregnant women from the previously indicated location, which represents ١٠% of all pregnant women that visited the same

location over the period from January to June/٢٠٢١, who have normal course of pregnancy during first, second or third trimester and willing to participate in this study.

Tools of data collection:

To achieve the aim of this study three tools were used by the researchers to obtain the necessary data as follows:

Tool I: A structured interview schedule: It was developed by the researchers after reviewing the recent related literature. It was divided into three parts to collect data about:

Part I: Socio-demographic characteristics of the studied pregnant women: it included name, age, level of education, occupation and residence.

Part II: Obstetric history of the studied pregnant women: it included number gravidity, parity, previous number of abortions, current gestational age at recruitment time, time of initial antenatal visits, place of receiving the antenatal follow up, number of the antenatal follow up visits, and mode of last delivery.

Part III: Pregnant Women's knowledge about COVID-١٩: This tool was adapted from Gaheen M^(٢٤) and was used to obtain pregnant women's knowledge about: causative organism of COVID-١٩, mode of

transmission, incubation periods, high risk groups, symptoms, effect of COVID-١٩ on maternal and fetal condition, methods of treatments and vaccination.

Scoring system: This questionnaire consisted of eleven closed ended questions, scored as (٠) for no answer or wrong answer, (١) for incomplete answer and (٢) for correct complete answer and then total knowledge score level was divided into three categories as "low knowledge level" scored for less than ٥٠%, "moderate knowledge level" scored from ٥٠% to <٧٥ % and "high knowledge level" scored for more than ٧٥ %.

Tool II: Pregnant Women's Concerns about COVID-١٩:

This tool was developed by the researchers after reviewing the recent related literature and included pregnant women's concerns about: being more alone than usual, if her life is in severe danger during the COVID-١٩ pandemic, if pregnant women may be more liable for infection than others, if the exposure to COVID-١٩ virus will harm her unborn baby or leads to fetal congenital anomalies, if she or her fetus is not receiving the care that she need, that COVID-١٩ infection leads to serious complications during pregnancy, the transmission of COVID-١٩ virus to her fetus, completion of pregnancy after infection with

COVID-19 virus, being alone during labor without supportive person, that her neonate requires incubator, that she can't breastfeed her baby due to the infection with COVID-19 virus, that she will be isolated from her baby due to the infection with COVID-19 virus, that treatment of the COVID-19 virus may harm her baby during pregnancy or during breastfeeding..... Three points likert scale (disagree, neutral, agree) were used to assess pregnant women's concerns about COVID-19. Disagree was scored as (0), neutral was scored as (1), and agree was scored as (2). Then results were interpreted as follows; A scoring $< 50\%$ was considered "low concern level", a scoring of $50\% - 70\%$ was considered "moderate concern level" while a scoring of $\geq 70\%$ was considered "high concern level".

Tool III: Pregnant Women's Preventive Behaviors regarding COVID-19: This tool was developed by the researchers after reviewing the recent related literature and included the preventive behaviors of pregnant women against Covid-19 as follows; frequent hand washing, frequent use alcohol, avoid touching eyes, nose and mouth, frequent clean surfaces with antiseptic solution, avoid going to crowded places, follow good respiratory hygiene, have enough period of comfort,

assess the fetal movement daily, drink at least 8 glasses of water, have a healthy balanced diet, perform daily and breathing exercises, contact maternity team, keep up to date on the latest information from trusted sources, such as WHO, attend all of her pregnancy scans and antenatal appointments.

Scoring system: This questionnaire consisted of eighteen closed ended questions, scored as (0) for not done, and (1) for done and then total preventive behaviors level was divided into two categories as follows; A scoring of $< 50\%$ was considered "unsatisfactory behavior" while a scoring of $\geq 50\%$ was considered "satisfactory behavior".

Methods:

1. Following an explanation of the study's purpose and aims, the dean of the faculty of nursing and the general manager of the obstetric and gynecological department were approached for collaboration and permission to perform the study.
2. **A pilot study** was carried out on 10% of the total sample (28 pregnant women who were excluded from the sample) to test the feasibility and applicability of the developed tools. After conducting the pilot study, it was founded that the sentences of the

tools were clear and relevant, few words had been modified. Then, the tools reconstructed and made ready for use .

٣. Ethical Considerations:

Pregnant women's oral consent was taken after providing complete and detailed information about the aim and the benefits of the study, as well as the opportunity of withdrawing at any time. The researchers ensured that the nature of the study didn't cause any harm or pain for the entire sample. In addition, confidentiality and privacy were taken into consideration regarding data collection.

٤. **Tool I (part I & II), Tool II and Tool III** were developed by the researchers after reviewing the recent related literature. Those tools were translated into Arabic and tested for their content and face validity by a jury of ٥ experts in the field of Maternity and Gynecological Nursing to evaluate the individual items as well as the entire instruments as being relevant and appropriate to test what they wanted to measure. The face validity of the tools were calculated based on experts' opinion after

calculating content validity index (%) of their items and it was ٩٧%, ٩٢,٨% and ٩٦,٦% respectively.

As well as to assess reliability, the study tools were tested by the pilot subjects at first session and retested after ٣ weeks as test-retest reliability for calculating Cronbach's Alpha which was ٠,٨٨, ٠,٨٧٥, ٠,٨٦٣ respectively.

٥. Field of work:

- Data collection was done over a period of six months from the beginning of January ٢٠٢١ to the end of to June ٢٠٢١.
- The researchers attended the research settings for data collection in the morning ٦ days per week until the predetermined sample size was collected.
- The researchers introduced themselves to the participants, took their informed consent and the interview schedule was then conducted individually for each participant using **Tool I part I& II** to collect basic data about their socio-demographic characteristics and obstetric history.
- Also, the knowledge of the participants about causative organism of COVID-

١٩, mode of transmission, incubation periods, high risk groups, symptoms, effect of COVID-١٩ on maternal and fetal condition, methods of treatments and vaccination using **Tool I part III**.

- Then pregnant women's concerns about covid-١٩ were collected using **Tool II**.

- ٦. Finally, pregnant women's preventive behaviors regarding covid-١٩ were taken using **Tool III**.

٧. **Statistical analysis:**

Upon completion of data collection, data was computed and analyzed using Statistical Package for the Social Science (SPSS), version ٢٤ for analysis. The P value was set at ٠,٠٠١. Descriptive statistics tests as numbers, percentage, mean standard deviation, were used to describe the results. Appropriate inferential statistics such as “F” test or “t” test was used as well.

Results

Table (١) presents the socio-demographic characteristics of the studied ٢٨٤ pregnant women. The analysis showed that their mean age was $27,03 \pm 0,19$ and ٦٧,٣% were housewives. Regarding their residence, ٥١,٤% were from rural areas and ٤٨,٦% had higher education.

Table (٢) illustrates obstetric history of the studied pregnant women. It was observed that ٣٧,٠% of the studied pregnant women were multigravida two times, ٣٦,٦% were multipara, and the majority of them (٨٠,٣%) hadn't previous history of abortion. Concerning current gestational age at recruitment time, ٤٢,٢% were second trimester and ٤٧,٩% started the time of initial antenatal visits in first trimester. Among the studied pregnant women, ٦٦,٢% received the antenatal follow up visits from private clinic and ٣٢,٠% had more than three visits. Regarding the mode of last delivery, more than half of them (٥٢,١ %) previously delivered by cesarean section.

Table (٣) shows percent distribution of the studied pregnant women according to their knowledge about COVID-١٩ that. It was illustrated that the majority of the studied pregnant women (٨٨,٠ % and ٨٦,٣ % respectively) had high level of knowledge about the type of COVID-١٩ infection and its mode of spread. As well as, more than three quarters of them (٧٦,٤ %) had high level of knowledge regarding isolation and treatment methods as an effective way to reduce the spread of the virus. On the other hand, less than half of the studied pregnant women (٤٦,٨%, ٤٥,٨%, and ٤٨,٦% respectively) had

moderate level of knowledge regarding who are susceptible to COVID-١٩, the effect of COVID-١٩ virus on pregnant women and their fetuses as well as (٦٠,٩%) of pregnant women had moderate level of knowledge that COVID-١٩ can be caught from a person who has no symptoms. In addition the table highlighted that, more than half of the studied pregnant women (٥٥,٣ %) had high level of total knowledge regarding COVID-١٩ infection.

Table (٤) shows percent distribution of the studied pregnant women according to their concerns about COVID-١٩ pandemic. The table revealed that, almost an equal proportions of the studied pregnant women (٧٤,٣ %, ٧٨,٩%, ٧٥,٧ %, ٧٦,٨%, ٧٧,١%, and ٧٢,٢ % respectively) had high concerns about dangerousity of COVID-١٩ on their life, they are more liable for infection than others, their exposure to the COVID-١٩ virus will harm their fetuses, they will not receiving the need care, feared from the transmission of COVID-١٩ virus to their fetuses, as well as serious complications of COVID-١٩ during pregnancy.

Table (٥) reveals percent distribution of the studied pregnant women according to their Level of preventive behaviors regarding COVID-١٩ pandemic. It was noticed that, the

majority of the studied pregnant women had maintained frequent hand washing (٨٢,٧%). Also, almost equal proportions (٧٥,٧ % and ٧٠,١% respectively) had frequent use of alcohol on their hands and wear facemask. Moreover, among the studied pregnant women, more than half of them (٥٦,٧% and ٥٥,٣% respectively) frequent clean surfaces with antiseptic solution and avoid touching eyes, nose and mouth. Moreover, ٨٢,٧% attended all their pregnancy scans and antenatal appointments and ٦٥,٨% were notifying maternity team with any developing symptoms of corona virus. On the other hand, ٦٦,٩% do not maintain at least ١-meter distance with others and do not follow good respiratory hygiene. Additionally, more than half of them (٥٥,٣% and ٥٢,٥% respectively) do not avoid going to crowded places and hadn't assessed their fetal movement daily and ٦٢,٠% don't keep up to date on the latest information about coronavirus.

Figure (١) shows that, two thirds of the studied pregnant women (٧٠,٤%) had high concerns about COVID-١٩ pandemic; while near to one fourth had moderate concerns (٢٢,٢%).

As shown in **figure (٢)**, more than half of the studied pregnant women (٥٢,٨ %) of the studied pregnant women had satisfactory

preventive behaviors regarding covid-19 virus.

Table ٦ shows correlation between the concerns score and knowledge score about COVID-19; data revealed that the total knowledge score showed direct significant correlation with the total concerns ($p < 0.001$) and preventive behaviors regarding COVID-19 virus ($p < 0.001$).

Table (٧) illustrates relation between knowledge of the studied pregnant women about covid-19 and their socio-demographic characteristics. It was revealed that ٢٩,٦% of women whose age ٢٥- < ٣٠ had high knowledge, while, ١٩,٤% of women whose age < ٢٥ had moderate knowledge about COVID-19. Also, ٢٥,٤% of housewives had moderate knowledge compared to ٢,٥% of employee women. Besides, ٣٢,٨% of women who reside urban regions had high knowledge while ٢١,٥% of rural women had moderate knowledge. Additionally, ٣٥,٩% of women who earned higher education had high knowledge while ٢٠,١% of secondary educated women had moderate knowledge. The difference was statistically significant ($p < 0.001$).

Table (٨) shows that ٣٣,١% of women whose age ٢٥- < ٣٠ had high concerns about COVID-19 pandemic, while, ١٣,٤% of women whose

age < ٢٥ had moderate concerns. Also, ٤٣,٧% of housewives had high concerns compared to ٢٦,٨% of employee women. Additionally, ٣٥,٩% of women with higher education had high concerns, while, ٩,٢% of secondary educated women had moderate concerns. The difference was statistically significant ($p < 0.001$).

Table (٩) shows that ٢٩,٥% of women whose age ٢٥- < ٣٠ had satisfactory preventive behaviors regarding COVID-19 virus, while, ٢٩,٢% of women whose age < ٢٥ had unsatisfactory preventive behaviors. Also, ٣٢,٠% of urban women had satisfactory preventive behaviors regarding COVID-19 virus compared to ٣٠,٦% of rural women with unsatisfactory preventive behaviors. Additionally, ٣٣,٥% of higher educated women had satisfactory preventive behaviors, while, ٢٣,٩% of secondary educated women had unsatisfactory preventive behaviors regarding COVID-19 virus. The difference was statistically significant ($p < 0.001$).

Table ١: Percent distribution of the studied pregnant women regarding their socio-demographic characteristics (N= ٢٨٤)

	N	%
Age (years)		
<٢٥	٩٧	٣٤,١٥
٢٥- <٣٠	١١٦	٤٠,٨٥
٣٠- <٣٥	٣٥	١٢,٣٢
٣٥ or more	٣٦	١٢,٦٨
Mean±SD	٢٧,٠٣±٥,١٩	
Job		
House wife	١٩١	٦٧,٣
Employee	٩٣	٣٢,٧
Residence		
Rural	١٤٦	٥١,٤
Urban	١٣٨	٤٨,٦
Educational level		
Illiterate	١١	٣,٩
Primary or preparatory	١٤	٤,٩
Secondary	١٢١	٤٢,٦
University or postgraduate	١٣٨	٤٨,٦

Table ٢: Percent distribution of the studied pregnant women regarding their obstetric history (N= ٢٨٤)

Obstetric history	N	%
Gravidity		
Primigravida	٧٥	٢٦,٤
Two	١٠٥	٣٧,٠
Three	٨٢	٢٨,٩
Four	٢٢	٧,٧
Parity		
None	٩٥	٣٣,٥
Primipara	٨٥	٢٩,٩
Multi-para	١٠٤	٣٦,٦
Previous Number of abortions		
None	٢٢٨	٨٠,٣
One	٤٥	١٥,٨
Two or more	١١	٣,٩
Current Gestational age at recruitment time		
First trimester	٩٢	٣٢,٤
Second trimester	١٢٠	٤٢,٢
Third trimester	٧٢	٢٥,٤
Time of initial antenatal visits		
First trimester	١٣٦	٤٧,٩
Second trimester	٩٦	٣٣,٨
Third trimester	٥٢	١٨,٣
Place of receiving the antenatal follow up		
Governmental hospital	٧٣	٢٥,٧
Maternal & child health center (MCH)	٢٣	٨,١
Private clinic	١٨٨	٦٦,٢
Number of the antenatal follow up visits		
More than three visits	٩١	٣٢,٠
More than four visits	٣٣	١١,٦
More than five visits	٥٢	١٨,٣
More than six visits	٣١	١١,٠
More than seven visits	٧٧	٢٧,١
Mode of last delivery		
Normal vaginal delivery	٥٣	١٨,٧
Cesarean section	١٤٨	٥٢,١
None	٨٣	٢٩,٢

Table ٣: Percent distribution of the studied pregnant women according to their knowledge about COVID-١٩ (N= ٢٨٤)

Women's Knowledge about COVID-١٩	High		Moderate		Low		Mean
	N	%	N	%	N	%	
What type of infectious disease is COVID-١٩?	٢٥٠	٨٨,٠	١٥	٥,٣	١٩	٦,٧	١,٨١
Mode of COVID-١٩ spread	٢٤٥	٨٦,٣	١٦	٥,٦	٢٣	٨,١	١,٧٨
COVID-١٩ incubation period	١٢٥	٤٤,٠	١١١	٣٩,١	٤٨	١٦,٩	١,٢٧
Susceptible people to COVID-١٩	١٢٤	٤٣,٧	١٣٣	٤٦,٨	٢٧	٩,٥	١,٣٤
Symptoms of COVID-١٩	١١٣	٣٩,٨	١٥٩	٥٦,٠	١٢	٤,٢	١,٣٦
COVID-١٩ can be caught from a person who has no symptoms	٦٥	٢٢,٩	١٧٣	٦٠,٩	٤٦	١٦,٢	١,٣٨
Vaccine, drug or treatment for COVID-١٩	١٤٤	٥٠,٧	٩١	٣٢,٠	٤٩	١٧,٣	١,٣٣
Isolation and treatment of people who are infected with the COVID-١٩ virus are an effective way to reduce the spread of the virus	٢١٧	٧٦,٤	٩	٣,٢	٥٨	٢٠,٤	١,٥٦
People who have contact with someone infected with the COVID-١٩ virus should be immediately isolated	١٩٤	٦٨,٣	٢١	٧,٤	٦٩	٢٤,٣	١,٤٤
Effect of COVID-١٩ virus on pregnant women	٧٠	٢٤,٦	١٣٠	٤٥,٨	٨٤	٢٩,٦	٠,٩٥
Effect of COVID-١٩ virus on fetus	٦٨	٢٣,٩	١٣٨	٤٨,٦	٧٨	٢٧,٥	٠,٩٦
Total	١٥٧	٥٥,٣	٧٩	٢٧,٨	٤٨	١٦,٩	١,٣٨

Table ٤: Percent distribution of the studied pregnant women according to their concerns about COVID-١٩ pandemic (N= ٢٨٤)

Pregnant Women's Concerns about COVID-١٩ pandemic	High		Moderate		Low		Mean
	N	%	N	%	N	%	
Are you concerned that you will be more alone than usual	٢٣٧	٨٣,٥	٣٣	١١,٦	١٤	٤,٩	١,٧٩
Are you concerned that your life is in severe danger during the COVID-١٩ pandemic	٢١١	٧٤,٣	٥٩	٢٠,٨	١٤	٤,٩	١,٦٩
Are you worried that pregnant women may be more liable for infection than others	٢٢٤	٧٨,٩	٤١	١٤,٤	١٩	٦,٧	١,٧٢
Are you worried that exposure to the COVID-١٩ virus will harm your unborn baby or leads to congenital anomalies	٢١٥	٧٥,٧	٥٠	١٧,٦	١٩	٦,٧	١,٦٩
Are you concerned that you or your baby is not receiving the care that you need	٢١٨	٧٦,٨	٤٤	١٥,٥	٢٢	٧,٧	١,٦٩
Are you feared from the transmission of COVID-١٩ virus to your baby	٢١٩	٧٧,١	٥٤	١٩,٠	١١	٣,٩	١,٧٣
Are you concerned that COVID-١٩ infection leads to serious complications during pregnancy	٢٠٥	٧٢,٢	٦٨	٢٣,٩	١١	٣,٩	١,٦٨
Are you concerned about completion of pregnancy after infection with COVID-١٩ virus	١٨٨	٦٦,٢	٨٢	٢٨,٩	١٤	٤,٩	١,٦١
Are you feared from being alone during labor	١٦٩	٥٩,٥	٩٣	٣٢,٨	٢٢	٧,٧	١,٥٢
Are you concerned that your neonate require incubator	١٨٩	٦٦,٦	٨١	٢٨,٥	١٤	٤,٩	١,٦٢
Are you concerned that you can't breastfeed your baby due to the infection with COVID-١٩ virus	١٦٢	٥٧,٠	٧٨	٢٧,٥	٤٤	١٥,٥	١,٤٢
Are you concerned that you will be isolated from your baby due to the infection with COVID-١٩ virus	١٩٣	٦٨,٠	٦٦	٢٣,٢	٢٥	٨,٨	١,٥٩
Are you concerned that treatment of the COVID-١٩ virus may harm your baby during pregnancy or during breastfeeding	١٥٦	٥٤,٩	٨٢	٢٨,٩	٤٦	١٦,٢	١,٣٩

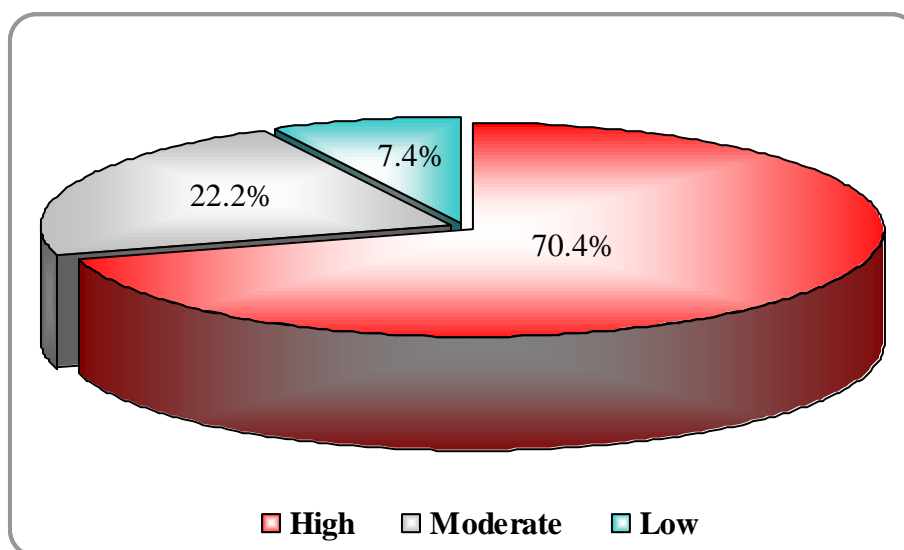


Figure (1) shows that, two thirds of the studied pregnant women (70.4%) had high concerns about COVID-19 pandemic; while near to one fourth had moderate concerns (22.2%).

Table ٥: Percent distribution of the studied pregnant women according to their level of preventive behaviors regarding COVID-١٩ pandemic (N= ٢٨٤)

Pregnant Women's Preventive Behaviors regarding COVID-١٩ virus	Done		Not done		Mean
	N	%	N	%	
Frequent hand washing	٢٣٥	٨٢,٧	٤٩	١٧,٣	٠,٨٣
Frequent use alcohol on the hand	٢١٥	٧٥,٧	٦٩	٢٤,٣	٠,٧٦
Frequent wear face mask	١٩٩	٧٠,١	٨٥	٢٩,٩	٠,٧٠
Avoid touching eyes, nose and mouth	١٥٧	٥٥,٣	١٢٧	٤٤,٧	٠,٥٥
Frequent clean surfaces with antiseptic solution	١٦١	٥٦,٧	١٢٣	٤٣,٣	٠,٥٧
Maintain at least ١ meter distance between yourself and others	٩٤	٣٣,١	١٩٠	٦٦,٩	٠,٣٣
Avoid going to crowded places	١٢٧	٤٤,٧	١٥٧	٥٥,٣	٠,٤٥
Ensure that you, and the people around you, follow good respiratory hygiene	٩٤	٣٣,١	١٩٠	٦٦,٩	٠,٣٣
Have enough period of comfort	١٦٠	٥٦,٣	١٢٤	٤٣,٧	٠,٥٦
Assess the fetal movement daily	١٣٥	٤٧,٥	١٤٩	٥٢,٥	٠,٤٨
Drink at least ٨ glasses of water or warm fluid frequently	١٦٤	٥٧,٧	١٢٠	٤٢,٣	٠,٥٨
Have a healthy balanced diet, and folic acid & vitamin D supplementation	١٧٩	٦٣,٠	١٠٥	٣٧,٠	٠,٦٣
Perform daily exercise	٨٩	٣١,٣	١٩٥	٦٨,٧	٠,٣١
Perform breathing exercise	٨٠	٢٨,٢	٢٠٤	٧١,٨	٠,٢٨
Attend all of your pregnancy scans and antenatal appointments unless you are advised not to	٢٣٥	٨٢,٧	٤٩	١٧,٣	٠,٨٣
Contact your maternity team if you have concerns about the wellbeing of yourself or your unborn baby	١٧٣	٦٠,٩	١١١	٣٩,١	٠,٦١
Tell midwife or maternity team when develop symptoms of coronavirus,	١٨٧	٦٥,٨	٩٧	٣٤,٢	٠,٦٦
Keep up to date on the latest information from trusted sources, such as WHO	١٠٨	٣٨,٠	١٧٦	٦٢,٠	٠,٣٨

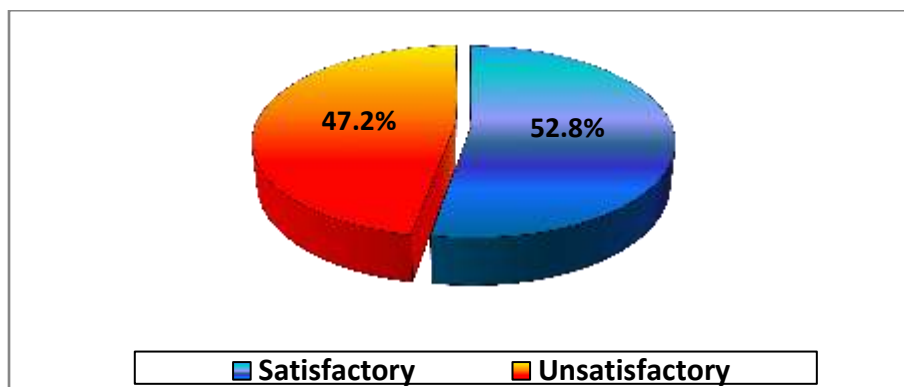


Figure ٧: Percent distribution of the studied pregnant women according to their total level of preventive behaviors regarding COVID-١٩ pandemic (N= ٢٨٤)

Table ٧: Correlation between the knowledge and Concerns about COVID-١٩ and Preventive Behaviors.

Items		knowledge about COVID-١٩	Concerns about COVID-١٩
Concerns about COVID-١٩	r	٠,٢٠١	
	P-value	<٠,٠٠١**	
Preventive Behaviors regarding COVID-١٩ virus	r	٠,٣٢٤	٠,١٢٦
	P-value	<٠,٠٠١**	٠,٠٣٤*

Table (V): Relation between knowledge of the Studied Pregnant Women about COVID-١٩ and their Socio-Demographic Characteristics.

Items	knowledge about COVID-١٩							
	High		Moderate		Low		Chi-square	
	N	%	N	%	N	%	X ^٢	P-value
Age (years)								
<٢٥	١٤	٤,٩	٥٥	١٩,٣	٢٨	٩,٩	١٠,٥٤٣	<٠,٠٠١**
٢٥- <٣٠	٨٤	٢٩,٦	١٦	٥,٦	١٦	٥,٦		
٣٠- <٣٥	٢٨	٩,٩	٣	١,١	٤	١,٤		
٣٥ or more	٣١	١٠,٩	٥	١,٨	٠	٠,٠		
Job								
House wife	٨١	٢٨,٥	٧٢	٢٥,٤	٣٨	١٣,٤	٤١,٠٤٤	<٠,٠٠١**
Employee	٧٦	٢٦,٨	٧	٢,٥	١٠	٣,٥		
Residence								
Rural	٦٤	٢٢,٥	٦١	٢١,٤	٢١	٧,٣	٢٩,٣١٠	<٠,٠٠١**
Urban	٩٣	٣٢,٨	١٨	٦,٣	٢٧	٩,٥		
Educational level								
Illiterate	٠	٠,٠	٠	٠,٠	١١	٣,٩	١٢٠,٧٥٤	<٠,٠٠١**
Primary or preparatory	٢	٠,٧	٣	١,١	٩	٣,٢		
Secondary	٥٣	١٨,٦	٥٧	٢٠,١	١١	٣,٩		
University or postgraduate	١٠٢	٣٥,٩	١٩	٦,٦	١٧	٦,٠		

Table (A): Relation between the Studied Pregnant Women's Concerns about COVID-19 and their Socio-Demographic Characteristics.

Items	Concerns about COVID-19							
	High		Moderate		Low		Chi-square	
	N	%	N	%	N	%	X ²	P-value
Age (years)								
<20	٤٧	١٦,٥	٣٨	١٣,٤	١٢	٤,٢	٣٨,٨٥٤	<٠,٠٠١**
20- <3٠	٩٤	٣٣,١	١٣	٤,٦	٩	٣,١		
3٠- <3٥	٢٨	٩,٩	٧	٢,٥	٠	٠		
3٥ or more	٣١	١٠,٩	٥	١,٨	٠	٠		
Job								
House wife	١٢٤	٤٣,٧	٥٣	١٨,٧	١٤	٤,٩	١٠,٦٥٤	٠,٠٠٥*
Employee	٧٦	٢٦,٨	١٠	٣,٥	٧	٢,٥		
Residence								
Rural	١٠٦	٣٧,٣	٣٢	١١,٢	٨	٢,٨	١,٧٠٢	٠,٤٢٧
Urban	٩٤	٣٣,١	٣١	١٠,٩	١٣	٤,٦		
Educational level								
Illiterate	٠	٠	٨	٢,٨	٣	١,١	٥٤,٢٥٣	<٠,٠٠١**
Primary or preparatory	٥	١,٨	٩	٣,٢	٠	٠		
Secondary	٩٣	٣٢,٧	٢٦	٩,٢	٢	٠,٧		
University or postgraduate	١٠٢	٣٥,٩	٢٠	٧,٠	١٦	٥,٦		

Table (٩): Relation between Studied Pregnant Women's Preventive Behaviors regarding COVID-١٩ virus and their Socio-Demographic Characteristics.

Items	Preventive Behaviors regarding COVID-١٩ virus					
	satisfactory		unsatisfactory		Chi-square	
	N	%	N	%	X ^٢	P-value
Age (years)						
<٢٥	١٤	٤,٩	٨٣	٢٩,٢	٨٧,١٣٦	<٠,٠٠١**
٢٥- <٣٠	٨٤	٢٩,٥	٣٢	١١,٣		
٣٠- <٣٥	٢٦	٩,٢	٩	٣,٢		
٣٥ or more	٢٦	٩,٢	١٠	٣,٥		
Job						
House wife	٨١	٢٨,٥	١١٠	٣٨,٧	٢٥,٣٥٦	
Employee	٦٩	٢٤,٣	٢٤	٨,٥		
Residence						
Rural	٥٩	٢٠,٨	٨٧	٣٠,٦	١٨,٥٥٦	<٠,٠٠١**
Urban	٩١	٣٢,١	٤٧	١٦,٥		
Educational level						
Illiterate	٠	٠	١١	٣,٩	٣٨,٨١٨	<٠,٠٠١**
Primary or preparatory	٢	٠,٧	١٢	٤,٢		
Secondary	٥٣	١٨,٧	٦٨	٢٣,٩		
University or postgraduate	٩٥	٣٣,٥	٤٣	١٥,١		

Discussion

The coronavirus disease ٢٠١٩ (COVID-١٩) pandemic has represented a major impact to health systems and societies worldwide. Pregnant women and their fetuses are at high risk during the outbreak of infectious diseases. In general, physiological and mechanical changes during pregnancy increase susceptibility to infection. According to recent findings, the risk of maternal mortality in COVID-١٩ pregnant women with severe illness appears to be considerable. Early Chinese research found that some children born to COVID-١٩ positive mothers had low birth weight and were preterm. All of these intensified pregnant women's concerns about themselves and their infants. As well, their level of fear and anxiety may affect their adherence to recommended healthy preventive behaviors of COVID - ١٩. The aim of the current study is to highlight assess pregnant women's concerns about Coronavirus disease ٢٠١٩ (COVID-١٩) and its relationship to their preventive behavior^(٢٣,٢٥-٢٦).

Regarding socio-demographic characteristics of the studied pregnant women, their mean age was ٢٧,٠٣±٥,١٩ years old. This finding goes in line with

Aghababaei et al., ٢٠٢٠^(٨) who assessed "Perceived risk and protective behavior about COVID-١٩ among Iranian pregnant women", they found that the average age of the women was ٢٠,٢٤ years old. In the same line, the finding of the current study agreed with **Anikwe et al, (٢٠٢٠)^(٢٧)** who studied "Coronavirus disease ٢٠١٩: Knowledge, attitude, and practice of pregnant women in a tertiary hospital in Abakaliki, southeast Nigeria" and found that the mean age of the respondents was ٢٠,٠٤ years old. This agreement between the two studies may be related to that the studied samples were taken during their reproductive age.

The findings of the present study also illustrated that about half of studied the pregnant women came from rural areas. These finding matched with **Nwafor et al., (٢٠٢٠)^(٢٨)** who studied the "Pregnant women's knowledge and practice of preventive measures against COVID-١٩ in a low-resource African setting ", the researcher concluded that the majority of the study sample were living in rural areas. Higher level educated pregnant women might be more active in seeking for information about COVID-١٩. Therefore, they may be more well-informed about its

risks and harms and subsequently more likely to express their concerns and fears. But also, they have higher tendency to engage in personal preventive behaviors. As regard the women's education level, the result of the current study demonstrated that about half of the studied pregnant women had higher education degree and about two third of them were housewives. These findings agreed with **Gaheen A, (2020)**⁽¹⁴⁾ who studied, "Effect of the New Corona Virus Disease 2019 on Pregnancy Outcome at El-Gharbia Governorate", she stated that almost half of participants had finished university or post-graduate education and slightly less than three fifth of them were housewives.

Regarding the obstetric history, the current study found that slightly more than one quarter of the pregnant women were primigravida, and almost two third of them had no previous history of abortion. In relation to the current gestational age at recruitment time, almost two fifth of women were in second trimester, and more than one third of them had more than three antenatal follow up visits. These results corroborate the findings of **Aghababaei et al., 2020**⁽¹⁵⁾ who said that the majority of participants were primigravida, had regular

prenatal care, and had no history of abortion. In the same line **Kumbeni et al., 2021**⁽¹⁶⁾, who investigated "Knowledge and preventive practices towards COVID-19 among pregnant women seeking antenatal services in Northern Ghana", found that the majority of the women 81.0% were in their second trimester, and women who went to 1-3 antenatal care appointments were 80.8%, while those who went to four or more were 84.2%.

COVID-19 infection is a public health problem with profound physiological and psychological consequences. Therefore, having adequate knowledge about this pandemic is essential for its management. Concerning the knowledge level regarding COVID-19, the findings of the current study showed that the majority of the studied pregnant women had high level of knowledge about what type of infectious disease is COVID-19 and its mode of spread, and more than three quarters of them had high level of knowledge about isolation and treatment of people who are infected with COVID-19 are an effective way to reduce the spread of the virus. These were in a path with **Anikwe et al., (2020)**⁽¹⁷⁾ and **Reuben et al, (2020)**⁽¹⁸⁾ who studied the "Knowledge, Attitudes

and Practices towards COVID-١٩: An Epidemiological Survey in North-Central Nigeria", they reported that the majority of the study subjects had correct answers about corona virus infection. From the researchers' point of view this high level of knowledge is expected due to the social impact of the COVID-١٩ pandemic on the studied areas.

As the outbreak of COVID-١٩ continues to unfold, major concerns are being raised about its effects on pregnancy and the potential risk of vertical transmission from an infected mother to her newborn. In this regard, the finding of the current study revealed that less than half of the studied pregnant women had moderate level of knowledge about the effect of COVID-١٩ infection on pregnant women and their fetuses. This disagreed with **Gaheen A, (٢٠٢٠)** ^(٢٤) who reported that all the women had incorrect answer regarding the effect of coronavirus infection on pregnancy. This may be due to the fact that this study was conducted in the early period of COVID-١٩ appearance which is characterized by lack of information about impact of COVID-١٩ on pregnancy outcomes.

Considering the total score level of COVID-١٩ knowledge, the study revealed that more than half of the pregnant women had high level of knowledge. This finding agreed with **Maharlouei et al., ٢٠٢٠** ^(٢١) who published a thesis titled "Knowledge and Attitude regarding COVID-١٩ among Pregnant Women in Southwestern Iran in the Early Period of Its Outbreak: A Cross-Sectional Study", they reported that pregnant women had a high level of knowledge about COVID-١٩. In the same line, this agreed with **Clements, ٢٠٢٠** ^(٢٢) who studied " Knowledge and behaviors toward COVID-١٩ among US residents during the early days of the pandemic: cross-sectional online questionnaire". From the researcher point of view this agreement could be related to the outcome of efforts provided by governmental and nongovernmental organizations to educate the public through various methods including newspapers, social media, short message services, and television programs. Additionally, large number of the pregnant women had a family member or more suffered from COVID-١٩.

However, these finding are contradictory with **Srichan et al. ٢٠٢٠** ^(٢٣) who studied "Knowledge, attitude, and preparedness to

respond to the 2019 novel coronavirus (COVID-19) among the bordered population of northern Thailand in the early period of the outbreak: a cross-sectional study," and reported that 44.1 % of women had poor knowledge of COVID-19. The difference in results could be explained by both the baseline characteristics of participants and the period of the study. Also our finding was in contrast to **Nicholas et al, 2020** ⁽³⁴⁾ who studied "COVID-19 knowledge, attitudes and practices in a conflict affected area of the South West Region of Cameroon". They revealed that only 21.9% of the participants had correct knowledge of COVID-19.

During COVID-19 epidemic, pregnant women may face greater psychological pressure and more complicated psychological problems. As they have many questions and concerns about the difficulty of receiving their routine prenatal examinations, to which degree COVID-19 can affect their course of pregnancy or their mode of delivery? ⁽³⁵⁾.

Regarding pregnant women's concerns about COVID-19, the current study found that nearly three quarter of the studied women had high concerns about the

dangerousity of COVID-19 pandemic on their life, Also almost two third of the study sample were concerned that they may be more liable for infection than others, and nearly three quarter of them were worried that their exposure to the COVID-19 virus will harm their fetuses. In addition more than three quarter of pregnant women feared from the inability to receive the care that they need, almost two third of them feared from the transmission of COVID-19 virus to their fetuses, and less than three quarter of them are concerned that COVID-19 infection leads to serious complications during pregnancy.

These findings agreed with **Zhong et al, 2020** ⁽¹⁾ who studied "COVID-19 knowledge, attitudes, and practices among Chinese residents during the rapid rise period of the COVID-19 outbreak". They found that the pregnant mothers were extremely concerned that their lives were in grave danger during the COVID-19 outbreak, that they were more prone to infection, and that their exposure to the COVID-19 virus would harm their fetus. The results of the current study also relatively matched with **Mappa I et al, (2020)** ⁽³⁶⁾, who studied "Effects of

coronavirus ١٩ pandemic on maternal anxiety during pregnancy". The researchers illustrated that the pregnant women who infected with corona virus had very high level of anxiety and becoming much stressed. This matching was accepted and may be related to the wide use of social media that has the potential to spread the panic in such public health emergencies through the publishing of fabricated nonscientific information which has great risk to cause public anxiety.

Relating to total score level of concerns about COVID-١٩ pandemic among the studied pregnant women, the findings of the present study showed that two thirds of them had high concerns about the COVID-١٩ pandemic, while near to one fourth had moderate concerns, and the minority had low concerns. These findings are consistent with those of **Overbeck et al., ٢٠٢٠** ^(٣٧) who investigated " Pregnant women's concerns and antenatal care during COVID-١٩ lockdown of the Danish society ", found that more than half of pregnant women believed that they were at a high risk of infection with COVID-١٩ and the majority were concerned about its possible health consequences. From the researchers' point of view, the COVID-١٩ pandemic

has triggered the global fear, anxiety and concern. As well as, some of the pregnant women in this study had a family member, a relative or a neighbor who died from COVID-١٩. Consequently, this has resulted in increased pregnant women's stress, anxiety, loneliness and depression.

Practicing preventive measures should be strictly followed by pregnant women to prevent the spread of COVID ١٩. In terms of pregnant women's adherence to preventive measures regarding COVID ١٩, the current study showed that the majority kept up with frequent hand washing, this finding contradict with Egyptian study of **Ahmed et al., ٢٠٢١** ^(٣٨), who investigated " the "Effect of the Whats App Educational Program on Pregnant Women's Knowledge, Attitude and PRACTICE regarding COVID -١٩", and found majority of pregnant women didn't wash hands frequently pre educational program. Additionally, the current study showed that three-quarters of pregnant women used alcohol on their hands, and two-thirds of them wore facemasks frequently, these findings contradict with the Egyptian study that found a majority of women don't wear a face mask as regular pre educational program ^(٣٨).

Also, **Motrico et al., 2021⁽¹¹⁾** conducted a study regarding good practices in perinatal mental health during the COVID-19 pandemic, and found majority of women engaged in preventative activities during COVID-19 recommended by public health experts, as washing sanitizing their hands multiple times each day, wore a face mask, avoided crowds, avoided eating in restaurants, avoided contact with high-risk people, and cleansed surfaces. On the other hand, the current study findings showed that about two third of pregnant women, did not keep at least a 1-meter distance from others and more than half of them did not avoid crowded places as well as did not practice good respiratory hygiene. These findings in agreement with Egyptian study of **Hassan et al., 2021⁽³⁹⁾**, who investigated the effect of health awareness program to pregnant women regarding corona virus disease and found more than three-quarters of pregnant women didn't maintain a social distance pre educational program.

Moreover, the present study confirmed that almost two third of the pregnant women attended all their pregnancy scans and antenatal appointments and about two third of them were notified maternity team with

any developing symptoms of corona virus. These findings agreed with **Overbeck et al., 2020⁽³⁷⁾** who reported that most pregnant women had experienced little disruption in their scheduled prenatal visits with the GP or midwife.

The current study also found that more than half of pregnant women's tested had satisfactory preventive behaviors regarding COVID-19, which agreed with **Maharlouei et al., 2020⁽³¹⁾** who found that the majority of the participants and their households were very concern about COVID-19 prevention measures. From the researchers' point of view, this may be associated with high level of concerns from COVID-19 health consequences on their pregnancy which motivating them to adhere to preventive behaviors.

In terms of the relationship between pregnant mothers' knowledge, concern, and preventive behaviors, the current study found that pregnant women who lived in cities, had a university degree, and were older had significantly higher knowledge, concern, and preventive behaviors (P-value = 0.001). These findings support those of **Maharlouei et al., 2020⁽³¹⁾** and **Kumbeni et al., 2021⁽³⁹⁾** as well as **Wang et al., 2021⁽⁴⁰⁾** who found that pregnant

women who lived in cities had considerably higher knowledge scores than their rural counterparts. Furthermore, university education ($OR = 1.04-1.07$) was a significant protective factor, as was older age ($OR = 0.42-0.57$). According to **Harper et al., 2020⁽¹⁾**, a positive relationships were generally noticed in those participants who were more concerned about COVID-19 and their active engagement with public health-compliant behaviors.

Conclusion:

Based on the findings of the present study, it can be concluded that pregnant women's level of knowledge and concerns significantly correlated to their compliance with recommended preventive behaviors regarding COVID-19.

Recommendations:

The current study suggested that regular health education and counseling programs about COVID-19 pandemic and the healthy recommended preventive behaviors to combat its consequences should be provided to all pregnant women who visit obstetrics and gynecology outpatient clinics supported by distributing pamphlets and booklets. Maternity nurses should pay more attention and reach to lower-educated

younger pregnant women especially in rural areas being a group with the least engagement in health preventive behaviors. As well as mass media and telenursing should be utilized for dissemination of simple, correct and relevant information about COVID-19 pandemic.

References:

1. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International journal of biological sciences. 2020;16(10):1740.
2. Gautam AS, Pathak N, Ahamad T, Semwal P, Bourai AA, Rana AS, Nautiyal OP. Pandemic in India: Special reference to Covid-19 and its technological aspect. Journal of Statistics and Management Systems. 2021 Feb 17;24(2):387-410.
3. COVID-19 CORONAVIRUS PANDEMIC, worldmeter <https://www.worldometers.info/coronavirus/>
4. European Centre for Disease Prevention and Control, High-risk

- groups for COVID-19, <https://www.ecdc.europa.eu/en/covid-19/high-risk-groups>
9. Hossain N, Samuel M, Sandeep R, Imtiaz S, Zaheer S. Perceptions, Generalized Anxiety and Fears of Pregnant women about Corona Virus infection in the heart of Pandemic. 2020.
10. Ozalp M, Demir O, Akbas H, Kaya E, Celik C, Osmanagaoglu MA. Effect of COVID-19 pandemic process on prenatal diagnostic procedures. The Journal of Maternal-Fetal & Neonatal Medicine. 2020 Sep 1:1-6.
11. Villar J, Ariff S, Gunier RB, Thiruvengadam R, Rauch S, Kholin A, Roggero P, Prefumo F, Do Vale MS, Cardona-Perez JA, Maiz N. Maternal and neonatal morbidity and mortality among pregnant women with and without COVID-19 infection: the INTERCOVID multinational cohort study. JAMA pediatrics. 2021 Apr 22.
12. Aghababaei S, Bashirian S, Soltanian A, Refaei M, Omid T, Ghelichkhani S, Soltani F. Perceived risk and protective behaviors regarding COVID-19 among Iranian pregnant women. Middle East Fertility Society Journal. 2020 Dec;25(1):1-9.
13. Wang CL. Impact of COVID-19 on Pregnancy. International Journal of Medical Sciences. 2021;18(3):763.
14. Basu A, Kim HH, Basaldua R, Choi KW, Charron L, Kelsall N, Hernandez-Diaz S, Wyszynski DF, Koenen KC. A cross-national study of factors associated with women's perinatal mental health and wellbeing during the COVID-19 pandemic. PloS one. 2021 Apr 21;16(4):e0249781.
15. Motrico E, Mateus V, Bina R, Felice E, Bramante A, Kalcev G, Mauri M, Martins S, Mesquita A. Good practices in perinatal mental health during the COVID-19 pandemic: a report from task-force RISEUP-PPD COVID-19. Clínica y Salud. 2020;31(3):100-6.
16. Hessami K, Romanelli C, Chiurazzi M, Cozzolino M. COVID-19 pandemic and maternal mental health: a systematic review and meta-analysis. The Journal of Maternal-Fetal & Neonatal Medicine. 2020 Oct 30:1-8.
17. Jia L, Li K, Jiang Y, Guo X. Prediction and analysis of coronavirus disease 2019. arXiv preprint arXiv:2003.05447. 2020 Mar 11.
18. Haque A, Pant AB. Efforts at COVID-19 vaccine development: challenges and successes. Vaccines. 2020 Dec;8(4):739.

10. Omer S, Ali S. Preventive measures and management of COVID-19 in pregnancy. *Drugs & Therapy Perspectives*. 2020 Jun;36(6):246-9.
11. Overbeck G, Graungaard AH, Rasmussen IS, Høgsgaard Andersen J, Kragstrup J, Wilson P, Ertmann RK. Pregnant women's concerns and antenatal care during COVID-19 lockdown of the Danish society. *Danish Medical Journal*. 2020 Nov 20.
12. Wang Q, Mo PK, Song B, Di JL, Zhou FR, Zhao J, Wu YL, Tian H, Qiu LQ, Xia J, Wang L. Mental health and preventive behaviour of pregnant women in China during the early phase of the COVID-19 period. *Infectious diseases of poverty*. 2021 Dec;10(1):1-1.
13. Ahorsu DK, Imani V, Lin CY, Timpka T, Broström A, Updegraff JA, Årestedt K, Griffiths MD, Pakpour AH. Associations between fear of COVID-19, mental health, and preventive behaviours across pregnant women and husbands: an actor-partner interdependence modelling. *International Journal of Mental Health and Addiction*. 2020 Jun 11:1-0.
14. World Health Organization. Coronavirus disease (COVID-2019) situation report - 94 2020. World Health Organization. 2020. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>. Accessed February 10, 2020.
15. World Health Organization. Corona virus Myth Busters. World Health Organization. 2020. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mythbuster-4.png?sfvrsn=e163bada_8. Accessed February 10, 2020.
16. Yassa M, Birol P, Yirmibes C, Usta C, Haydar A, Yassa A, Sandal K, Tekin AB, Tug N. Near-term pregnant women's attitude toward, concern about and knowledge of the COVID-19 pandemic. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2020 Nov 16;33(22):2827-34.
17. Zhang L, Jiang Y, Wei M, Cheng BH, Zhou XC, Li J, Tian JH, Dong L, Hu RH. Analysis of the pregnancy outcomes in pregnant women with COVID-19 in Hubei Province. *Zhonghua fu chan ke za zhi*. 2020;166-71.
18. Pakpour AH, Griffiths M D. The fear of COVID-19 and its role in preventive behaviors. *Journal of Concurrent Disorders*. 2020; 2(1), 08-13.
19. Gaheen A, Sayed MA. Effect of the New Corona Virus Disease 2019 on Pregnancy

- Outcome at El-Gharbia Governorate. Tanta Scientific Nursing Journal. 2020. Nov 1;19(1):181-210.
20. Dashraath P, Wong JL, Lim MX, Lim LM, Li S, Biswas A, Choolani M, Mattar C, Su LL. Coronavirus disease 2019 (COVID-19) pandemic and pregnancy. American journal of obstetrics and gynecology. 2020. Jun 1;222(6):521-31.
21. Nanjundaswamy MH, Shiva L, Desai G, Ganjekar S, Kishore T, Ram U, Satyanarayana V, Thippeswamy H, Chandra PS. COVID-19-related anxiety and concerns expressed by pregnant and postpartum women—a survey among obstetricians. Archives of Women's Mental Health. 2020. Dec;23(6):787-90.
22. Anikwe CC, Ogah CO, Anikwe IH, Okorochukwu BC, Ikeoha CC. Coronavirus disease 2019: Knowledge, attitude, and practice of pregnant women in a tertiary hospital in Abakaliki, southeast Nigeria. International Journal of Gynecology & Obstetrics. 2020. Nov;151(2):197-202.
23. Nwafor JI, Aniukwu JK, Anozie BO, Ikeotuonye AC. Knowledge and practice of preventive measures against COVID-19 infection among pregnant women in a low-resource African setting. MedRxiv. 2020. Jan 1.
24. Kumbeni MT, Apanga PA, Yeboah EO, Lettor IB. Knowledge and preventive practices towards COVID-19 among pregnant women seeking antenatal services in Northern Ghana. Plos one. 2021. Jun 17;16(6):e0253446.
25. Reuben RC, Danladi MM, Saleh DA, Ejembi PE. Knowledge, attitudes and practices towards COVID-19: an epidemiological survey in North-Central Nigeria. Journal of community health. 2021. Jun;46(3):407-10.
26. Maharlouei N, Asadi N, Bazrafshan K, Roozmeh S, Rezaianzadeh A, Zahed-Roozegar MH, Shaygani F, Kharmandar A, Honarvar B, Hemyari C, Omidifar N. Knowledge and Attitude regarding COVID-19 among Pregnant Women in Southwestern Iran in the Early Period of its Outbreak: A Cross-Sectional Study. The American journal of tropical medicine and hygiene. 2020. Dec;102(6):2368-2370.
27. Clements JM. Knowledge and behaviors toward COVID-19 among US residents during the early days of the pandemic: cross-sectional online questionnaire. JMIR public health and surveillance. 2020. May 8;6(2):e19161.

33. Srichan P, Apidechkul T, Tamornpark R, Yeemard F, Khunthason S, Kitchanapaiboon S, Wongnuch P, Wongphaet A, Upala P. Knowledge, attitude and preparedness to respond to the 2019 novel coronavirus (COVID-19) among the bordered population of northern Thailand in the early period of the outbreak: a cross-sectional study. Available at SSRN 3046046. 2020 Feb 24.
34. Nicholas T, Mandaah FV, Esemu SN, Vanessa AB, Gilchrist KT, Vanessa LF, Shey ND. COVID-19 knowledge, attitudes and practices in a conflict affected area of the South West Region of Cameroon. The Pan African Medical Journal. 2020; 30(Suppl 2).
35. Zhou, Y, Shi H, Liu, Z. et al. The prevalence of psychiatric symptoms of pregnant and non-pregnant women during the COVID-19 epidemic. Translational Psychiatry Journal. 2020; 10, 319.
36. Mappa I, Distefano FA, Rizzo G. Effects of coronavirus 19 pandemic on maternal anxiety during pregnancy: a prospective observational study. Journal of Perinatal Medicine. 2020 Jul 1; 48(6):040-0.
37. Overbeck G, Graungaard AH, Rasmussen IS, Høgsgaard Andersen J, Kragstrup J, Wilson P, Ertmann RK. Pregnant women's concerns and antenatal care during COVID-19 lockdown of the Danish society. Danish Medical Journal. 2020 Nov 20.
38. Ahmed Mohammed Sabry F, Ahmed Abdelhafez Mohamed A, Mohammed Amein Ghanem N, Saad Abd El-aty N, Hussein Ahmed N. Effect of What Sapp Educational Program Reminder on Pregnant Women's Knowledge, Attitude and Practice Regarding COVID-19 pandemic. Egyptian Journal of Health Care. 2021 Sep 1; 12(3):116-30.
39. Hassan Ali H, Morsy Yousif A, Abdo Abd El-Haleem S. Health Awareness Program to Pregnant Women Regarding Corona virus Disease (Covid 19). Egyptian Journal of Health Care. 2021 Dec 1; 12(4):1280-303.
40. Wang Q, Mo PK, Song B, Di JL, Zhou FR, Zhao J, Wu YL, Tian H, Qiu LQ, Xia J, Wang L. Mental health and preventive behaviour of pregnant women in China during the early phase of the COVID-19 period. Infectious diseases of poverty. 2021 Dec; 10(1):1-1.
41. Harper CA, Satchell LP, Fido D, Latzman RD. Functional Fear Predicts Public Health Compliance in the COVID-19

International journal of mental health and

addiction, ٢٠٢١; ١٩(٥), ١٨٧٥-١٨٨٨.

Effect of Health Belief Model-based Educational Intervention on COVID-١٩ Preventive Behaviors among Pregnant Women

Hend Abdallah EL Sayed ' ,AhlamElahmady Sarhan '

'Assistant Professor of Obstetrics and Woman Health Nursing, Faculty of Nursing, Benha University, Egypt

'Assistant Professor of Community Health Nursing, Faculty of Nursing, Benha University, Egypt

**Corresponding author: hend.afify@fnur.bu.edu.eg*

Abstract

Background: Educating pregnant women can improve compliance with COVID-١٩ prevention behaviors. **Aim** of the study was to investigate the effect of health belief model-based educational intervention on COVID-١٩ preventive behaviors among pregnant women. **Design:** A quasi-experimental research design (pretest/posttest, comparison group) was utilized. **Setting:** This study was carried out in the Obstetrics and Gynecology outpatient clinic at Benha University Hospital. **Sample:** A total of ١٧٤ pregnant women were enrolled in the study using a purposive technique. **Data collection tools** included a structured interviewing questionnaire with three sections covering demographic features of the studied woman, obstetric history, and pregnant women's knowledge about COVID-١٩. Health Belief Model scale and checklist for self-reported compliance with COVID-١٩ health preventive behaviors. **Results:** After one month of health belief model-based educational intervention, the mean scores of the overall health belief model and subscales for perceived susceptibility, perceived severity, perceived benefits, perceived self-efficacy, as well as cues to action about COVID-١٩ were significantly increased, while the mean score of perceived barriers was markedly lower in the study group ($P < ., ., ., .$). The majority of the study group had high compliance with COVID-١٩ preventive behaviors, compared to more than a quarter of the control group. **Conclusion:** Health belief model-based educational intervention was effective in improving pregnant women's knowledge, health beliefs, as well as self-reported compliance with preventive behaviors regarding COVID-١٩. **Recommendation:** Provide continuous educational programs based on health

belief model to enhance pregnant women's knowledge and compliance with COVID-19 pandemic preventive behaviors.

Keywords: COVID-19, educational intervention, health belief model, pregnant, preventive behaviors.

Introduction

Pregnancy exposes women to viral infections of the respiratory system as a result of the physiological alterations of the immune system, heart, and lungs ⁽¹⁾. Infectious disorders can have a significant impact on maternal and fetal outcomes. Stillbirth, miscarriage, and preterm delivery are all possible outcomes of prenatal respiratory infections ⁽²⁾.

According to the World Health Organization (WHO), the COVID-19 virus is spreading rapidly, and a global pandemic was announced on March 11, 2020 ⁽³⁾. COVID-19 is a single-stranded, non-segmented RNA-encapsulated virus that causes symptoms varying from a mild cold to a life-threatening sickness. COVID-19 infection during pregnancy has yet to be proven to cause intrauterine infection ⁽⁴⁾.

Table 2. Nurse's general knowledge regarding COVID-19. (N= 110) COVID-19 infection is associated with an increased temperature, shortness of breath, cough, and symptomatic pneumonia, which can be

confirmed by a positive RNA or lungs computed tomography ⁽⁵⁾. Pregnant women may be more susceptible to unfavorable outcomes during an outbreak due to the amplification of specific pregnancy issues ⁽⁶⁾. Adverse pregnancy outcomes related to COVID-19 include pregnant women are at risk of preterm deliveries, cesarean section, intensive care unit admission, mechanical ventilation, and mortality ^(7,8).

With the global spread of the novel COVID-19 virus, pregnant women's preventative health behaviors have become critical. In particular, the transmission rate of infectious diseases can be lowered by raising knowledge and practicing preventive measures ⁽⁹⁾.

The efficacy of education depends on the appropriate use of health behavior theories and models. Such models have been shown to be helpful in promoting health by helping to elucidate risk factors and modify health behaviors ⁽¹⁰⁾. The health belief model, which emphasizes behavior as a function of a woman's knowledge and beliefs, is one of the most appropriate models for improving incorrect beliefs and adopting healthy behaviors ^(11,12).

The Health Belief Model (HBM) is an extensively used psychosocial behavior change model that includes five main structures: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, as well as cues to action ⁽¹⁷⁾. According to HBM, pregnant women should perceive the health threat posed by COVID-19 as a major health hazard to engage in preventive measures. This implies that women are considering themselves to be at risk (perceived susceptibility) and aware of the consequences and dangers (perceived severity). In addition, recognizing the efficacy of preventive behaviors (perceived benefits). Identifying and striving to eliminate impediments to preventative behaviors (perceived barriers), as well as incentives to participate in healthy lifestyle actions (cues to action) ⁽¹⁸⁾.

Currently, therapeutic management is primarily supportive with a major focus on preventing transmission of the COVID-19 virus ⁽¹⁹⁾. Therefore, educational interventions are extremely important for the COVID-19 prevention strategy. It is essential to evaluate women's health beliefs about the prevention and management of COVID-19, as well as the motivation to engage in preventive behaviors

that include wearing protective equipment, keeping a safe social distance, as well as staying at home ⁽¹⁶⁾. Besides, compliance with prevention and personal cleanliness rules, for example, hands washing on a regular basis and covering the mouth and nose while coughing or sneezing ⁽¹⁷⁾.

Nurses can assist pregnant women with COVID-19 or who dealt with infected individuals by providing direct care, educating, coaching, and counseling. Pregnant women should be taught to keep prenatal appointments and to limit interactions with others to minimize infection ^(18, 19). Also, women experiencing COVID-19 symptoms must be advised to get tested as soon as possible with a nasal or throat swab, and to self-isolate to avoid cross-transmission ⁽²⁰⁾.

Significance of the study

The disease produced by the novel COVID-19 virus is presently the most serious health problem facing the world ⁽²¹⁾. In each contagious disease outbreak, pregnant women constitute a highly vulnerable group due to physiology and immune processes are altered and thus these women become more susceptible to infection ⁽²²⁾. Worldwide, by May 17, 2021, COVID-19 has registered 162,174,951 cases with 3,381,517 deaths

(٢٣). From January ٣, ٢٠٢٠, to June ٥, ٢٠٢١, there were ٢٦٧,١٧١ confirmed Covid-١٩ cases in Egypt, including ١٥,٣٠٩ deaths (٢٤). According to a systematic review conducted by Juan and Gil(٢٥), among pregnant women, COVID-١٩ disease was ٩٥,٦ percent mild, ٣,٦ percent severe, and ٠,٨ percent critical. Since vaccination is still progressing slowly and there is no specific treatment available. Therefore, practicing COVID-١٩ preventive behaviors is widely accepted to be the most beneficial and cost-effective. Accordingly, pregnant women's beliefs about the COVID-١٩ infection can have a significant impact on compliance with preventive behaviors for curtailing the control of the COVID-١٩ outbreak. Consequently, it is vital to equip and empower pregnant women with a thorough understanding of COVID-١٩, as well as accurate health beliefs related to the vulnerability and the seriousness of COVID-١٩, along with stressing the benefits of complying with preventive health behaviors. To our knowledge, there are no studies that have applied HBM educational interventions for COVID-١٩ to pregnant women. So, this study was carried out.

Aim of the study

The study aimed to investigate the effect of health belief model-based educational intervention on COVID-١٩ preventive behaviors among pregnant women.

Research hypotheses

The following research hypotheses were formulated to fulfill the aim of the current study:

Hypothesis ١: Pregnant women who exposed to the health belief model-based educational intervention will have improved knowledge about COVID-١٩ than those who do not expose.

Hypothesis ٢: Pregnant women who exposed to the health belief model-based educational intervention will have positive changes of health beliefs regarding COVID-١٩ than those who do not expose.

Hypothesis ٣: Pregnant women who exposed to the health belief model-based educational intervention will have higher levels of self-reported compliance with COVID-١٩ preventive behaviors than those who do not expose.

Subjects and Method

Research design

The present study used a quasi-experimental research design (pretest / posttest, comparison group).

Research setting

This study was carried out in the Obstetrics and Gynecology outpatient clinic at Benha University Hospital.

Sample

A total of 142 pregnant women were enrolled in the current study using a purposive technique, according to the inclusion criteria: pregnant women who attended the antenatal follow-up visits at the previously mentioned setting, had not been diagnosed with confirmed COVID-19, had no medical or obstetric complications, literate, and agreed to participate. While women with respiratory symptoms or a suspected COVID-19 diagnosis, who required hospitalization, and women who have received the same intervention before were excluded. The sample size was determined using the Yamane⁽²¹⁾ statistical equation “ $n = N / (1 + N(e)^2)$ ” where n is the required size, N is the total population size (1190 women), according to the statistical center of Benha University Hospital⁽²²⁾, and e is the level of precision was (0.05). In equal allocation ratio (1:1), the sample was divided into two groups: the study group (who exposed to the health belief model-based educational intervention) and the control group (who received conventional prenatal care).

Data collection tools

For collecting the data, three tools were utilized.

First tool: A structured interviewing questionnaire

The researchers designed the tool after reviewing the relevant literature^(23,24). It was divided into three sections:

Section (1) addressed the demographic features of the studied pregnant women; including age, level of education, occupation, residence, and the monthly income of the family.

Section (2) was dealt with obstetric history included gravidity, and gestational age.

Section (3) was concerned with assessing pregnant women's knowledge about COVID-19 using 10 items which contained 19 multiple-choice questions covering definition, incubation period, signs and symptoms, high-risk group of infection, routes of transmission, diagnosis, complications, COVID-19 related adverse pregnancy outcomes, methods of management as well as preventive and precautionary measures during the pandemic.

Scoring system: Each item was scored by a dichotomous scale; correct answers got a score of two, while incorrect or I don't know answers got a score of one. The total score of knowledge was between 10 and 38, then distributed into two categories as inadequate

knowledge when the total score less than 60% ($1 < 23$ degrees) and considered adequate knowledge when the total score equal and more than 60% ($23 \leq 38$ degrees).

Second tool: Health Belief Model scale

This scale was adapted by the researchers after reviewing prior studies (29,30,31), to assess pregnant women's health beliefs regarding COVID-19. The HBM scale involved six subscales comprising 20 items: perceived susceptibility (3 items), perceived severity (2 items), perceived benefits from compliance with preventive measures (6 items), perceived barriers to compliance with preventive measures (6 items), self-efficacy (2 items), as well as cues to action (3 items).

Scoring system: Each item was graded on a five-point Likert scale, with 1 indicating "strongly disagree" and 5 indicating "strongly agree". The scores for the items of each subscale were summed up and then the overall scale, the overall score ranged from 20-100. For the overall HBM scale and subscales, higher scores indicate more positive health beliefs toward COVID-19, except for perceived barriers of compliance with preventive measures, higher scores indicate more negative health beliefs.

Third tool: Checklist for self-reported compliance with COVID-19 health preventive behaviors

The tool was designed by researchers after reviewing related literature (32,33,34), to assess self-reported compliance with preventive behaviors against COVID-19. It consisted of 14 items.

Scoring system: Each COVID-19 preventive behavior was assessed by a three-point Likert scale, always, sometimes, and never scored 3, 2, and 1, respectively. The lowest possible score was 14 whereas the highest possible score was 42. The sum of the scores for all items is classified as follows: low compliance $< 50\%$ ($1 - 20$ degrees), partial compliance $50\% < 70\%$ ($21 - 31$ degrees) and high compliance $70\% \geq 100$ ($32 - 42$ degrees).

Validity and reliability

A panel of three experts in the fields of Obstetrics and Woman Health Nursing, as well as Community Health Nursing, evaluated and confirmed the tools' content and face validity. Based on the experts' comments, the required amendments were made as a rephrasing some sentences of the HBM scale. Reliability was performed using Cronbach's Alpha coefficient test; the first tool's internal consistency was 0.81. For the second tool, the overall HBM scale's internal consistency was

٠,٨٦, and HBM subscales were perceived susceptibility (٠,٨٣), perceived severity (٠,٨٠), perceived benefits (٠,٨٩), perceived barriers (٠,٧٩), perceived self-efficacy (٠,٨٥), and cues to action (٠,٨٢). The third tool had an internal consistency of ٠,٨٧.

Ethical considerations

The ethical aspects were followed by researchers, including verbal informed consent was obtained after explaining all pertinent information about the study (aim and activities, expected outcomes, and benefits and risks associated), and voluntary participation was clarified. Confidentiality and anonymity were also guaranteed. Participants were told the right to discontinue at any time without any consequences. The precautionary measures were ensured by wearing protective face masks and maintaining a safe physical distance during data collection. After completion of the study, a designed educational booklet about COVID-١٩ preventive measures was given to the control group.

Pilot study

The simplicity, clarity, and applicability of the tools were evaluated in a pilot study involving ١٠% of the entire sample (١٧

women). The time required to collect the questionnaires was determined as well as any problems peculiar during data collection were identified. Since no modifications were made, pilot study participants were included within the total sample size.

Field work

An official letter from the dean of the Faculty of Nursing was taken and forwarded to the hospital director seeking permission to perform the study after clarifying the objective. The study was conducted in four stages namely assessment, planning, implementation, as well as evaluation. The stages lasted nine months from the start of October ٢٠٢٠ until end of June ٢٠٢١. The researchers were accessible three days weekly (Saturday, Tuesday, and Thursday) at the aforementioned setting from ٩ a.m. to ١ p.m. Researchers executed the precautionary measures from the pandemic throughout the stages of the study.

Assessment phase: The researchers interviewed the participants in the outpatient waiting place, introduced themselves, and explained to each participant the objective, process, and expected outcomes of the study and then verbal consent to participate was

attained. The tools were filled by women in two groups (pretest). The time to complete the three tools took approximately ٣٠-٤٥ minutes per woman (the first was ٥-١٠ minutes, the second was ١٥-٢٠ minutes, the third was ١٠-١٥ minutes), and an average of ٨-١٠ women were interviewed each week.

Planning phase: According to the analysis of pretest findings gained during the assessment phase on detecting the actual educational needs of women and relevant literature, the researchers designed an educational intervention based on HBM subscales to improve the deficiency of knowledge, health beliefs coupled with preventive behaviors of pregnant women regarding COVID-١٩. The educational methods and the number of sessions required were determined. Accordingly, an educational booklet about COVID-١٩ preventive measures has been designed and judged by experts. The booklet was written in a simple Arabic language with attractive and colorful pictures and included a definition, an incubation period, signs and symptoms, high-risk group of infection, routes of transmission, diagnosis, complications of COVID-١٩, adverse effect on maternal and neonatal outcomes, medical management and vaccination, the applicability of precautionary preventive

behaviors. As well as measures to manage stress, and anxiety during this pandemic.

Implementation phase: In the study group, HBM-based intervention included four educational sessions held over two weeks (two sessions per week), each session lasting ٣٥-٤٥ minutes. The first session focused on pregnant women's perceptions of sensitive and vulnerability to COVID-١٩ infection (perceived susceptibility), followed by a comprehensive understanding of the seriousness and negative effects of COVID-١٩ infection during pregnancy (perceived severity), by providing information about definition and overview of COVID-١٩ morbidity and mortality, incubation period, signs and symptoms, high-risk group of infection, routes of transmission, diagnosis, complications, in addition to adversely affecting maternal and neonatal outcomes. After completing the first session, participants were handed an educational booklet.

The second session addressed the value and necessity of compliance with the applicability of preventive behaviors (perceived benefits) were highlighted by explaining and demonstrating preventive behaviors as the proper method of wearing, removing, and disposing of the mask. Hand washing frequency, and correct technique, as well as

coughing and sneezing etiquette. Also emphasized measures related to personal hygiene, cleanliness of the surrounding environment, maintaining a distance of at least one meter from others, attending prenatal visits, eating a balanced diet, taking vitamins as prescribed, drinking plenty of water, engaging in recommended regular exercise, maintaining adequate sleep, and the isolation protocol was clarified if necessary.

During the third session, each woman identified the challenges and obstacles to adopting COVID-١٩ preventive measures, and researchers presented ways to overcome and resolve these issues through group discussion (perceived barriers).

The fourth session focused on empowering women to believe in abilities to prevent COVID-١٩ by applying correct preventive behaviors (perceived self-efficacy). Additionally, pregnant women's readiness to engage in COVID-١٩ preventive health behaviors when holding appropriate beliefs. one of the cues to action was an internal stimulus, as worry about pregnancy during the pandemic, while the others were external stimuli such as an educational booklet, media, and family (cues to action).

After each session, feedback on the previous session was given, as well as the objectives

for the next one. Teaching methods used were group discussion, questions and answers, demonstration and redemonstration, PowerPoint presentations, brainstorming, and short educational videos.

Evaluation phase:

One month after the implementation of the educational intervention, post testing of the study and control groups was performed using the same pretest tools (the first tool 'section ٣', the second and third tools). To eliminate bias, the evaluation began first with the control group and later with the study group.

The control group received conventional prenatal care without any intervention by researchers. Meanwhile, after evaluation, the women in the control group were given a designed educational booklet.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) version ٢٦ was used to analyze the collected data. The Kolmogorov-Smirnov test was used to verify the normal distribution of the data, which was confirmed. As descriptive statistics, the frequency and percentage of qualitative data, as well as the mean and standard deviation of quantitative data, were utilized. The Chi-square test, Fisher exact

test, and independent t-test were used to assess the differences between the two groups. The Pearson correlation coefficient was employed to examine the association between the quantitative continuous variables. The P-value was considered significant at 0.05 , and the statistical significance was considered high at 0.001 .

Limitations or obstacles of the study

Despite the fact that research on COVID-19 has been conducted from a variety of perspectives and on different population groups, there is currently a lack of research on educational interventions for pregnant women using the HBM model as a framework for comparing findings of the current study.

Results

Table (1) denotes that 52.9% and 50.6% of the study and control groups, were between the ages of 20 and 30 years, with mean ages of 26.04 ± 2.31 and 27.74 ± 2.12 years, respectively. Regarding level of education, 49.4% and 46.0% of the study and control groups had a secondary education, respectively, While 72.4% of the study group and 60.9% of the control group were housewives. Rural areas are residence to 70.9% and 83.9% of the study and control groups, respectively. The majority of the two groups had insufficient monthly income. No

significant difference in demographic characteristics between the two groups ($p > 0.05$).

Table (2) demonstrates that 67.8% and 54.0% of the study and control groups were primigravidas respectively. While 69.0% and 72.5% of the study and control groups were in the second trimester of pregnancy respectively.

Figure (1) shows that before the educational intervention, 21.8% in the study group and 26.4% in the control group had adequate knowledge about COVID-19 (p -value= 0.479). Meanwhile, after one month of the educational intervention, 89.7% of the pregnant women in the study group had an adequate level of knowledge, compared to 31.0% of the control group (p -value= 0.001).

Table (3) displays that the mean health belief scores about COVID-19 in the two groups before the educational intervention were similar in all subscales ($p > 0.05$). However, after one month of the educational intervention, mean scores for perceived susceptibility, perceived severity, perceived benefits, perceived self-efficacy, as well as cues to action were significantly higher in the study group than in the control group, while

the mean score of perceived barriers was markedly lower in the study group ($P < 0.001$). Figure (5) reveals that the mean overall health belief model score about COVID-19 in the study and control groups was 31.37 and 30.26, respectively, with no significant difference between the two groups before the educational intervention ($p\text{-value} = 0.304$). Whereas the mean overall health beliefs model score in the study group was noticeably higher than in the control group after one month of the educational intervention ($p\text{-value} = 0.001$).

Table (4) clarifies that before the educational intervention, there was no statistically significant differences between the study and control groups with respect to all items of self-reported compliance with COVID-19 preventive behaviors ($P > 0.05$). Whilst one month after educational intervention, highly statistically significant differences were found between both groups ($P < 0.001$).

Figure (3) shows that before the educational intervention, 30.7 % of pregnant women in the study group and 24.1 % in the control group had high compliance with COVID-19 preventive behaviors ($p\text{-value} = 0.643$). While after one month of the educational intervention, 86.3% of pregnant women in the study group had high compliance with

COVID-19 preventive behaviors, compared to 26.5 % in the control group ($p\text{-value} = 0.001$).

Table (5) indicates a significant positive correlation between scores of total knowledge, the health belief model as well as self-reported compliance with COVID-19 preventive behaviors before and one month after educational intervention in the study and control groups ($P < 0.001$).

Table (6) portrays a significant positive correlation between overall score of health belief model and total self-reported compliance with COVID-19 preventive behaviors score before and one month after educational intervention in study and control groups ($P < 0.001$).

Table ١: Distribution of pregnant women in the study and control groups by demographic features (n=١٧٤)

Groups Variables	Study group n=٨٧		Control group n=٨٧		X ^٢ / FET	P-value
	No	%	No	%		
Age (years)						
٢٠ < ٢٥	١٠	١١,٥	١٣	١٤,٩	١,٤٨٧ ^٤	٠,٦٨٥ ^{ns}
٢٥ < ٣٠	٤٦	٥٢,٩	٤٤	٥٠,٦		
٣٠ < ٣٥	٢٤	٢٧,٦	٢٦	٢٩,٩		
٣٥ ≤ ٤٠	٧	٨,٠	٤	٤,٦		
Mean ± SD	٢٦,٥٤ ± ٢,٣١		٢٧,٧٤ ± ٢,١٢		t=١,٢٧٦	٠,٢٠٤ ^{ns}
Level of education						
Primary education	١٢	١٣,٩	٧	٨,٠	٢,٧٨٤ ^٤	٠,٤٢٦ ^{ns}
Secondary education	٤٣	٤٩,٤	٤٠	٤٦,٠		
University education	٢٩	٣٣,٣	٣٥	٤٠,٣		
Postgraduate studied	٣	٣,٤	٥	٥,٧		
Occupation						
Working	٢٤	٢٧,٦	٣٤	٣٩,١	٢,٥٨٦	٠,١٠٨ ^{ns}
Housewife	٦٣	٧٢,٤	٥٣	٦٠,٩		
Residence						
Urban	٢١	٢٤,١	١٤	١٦,١	١,٧٥٣	٠,١٨٦ ^{ns}
Rural	٦٦	٧٥,٩	٧٣	٨٣,٩		
Monthly income						
Sufficient	١١	١٢,٦	١٧	١٩,٥	١,٥٣٢	٠,٢١٦ ^{ns}
Insufficient	٧٦	٨٧,٤	٧٠	٨٠,٥		

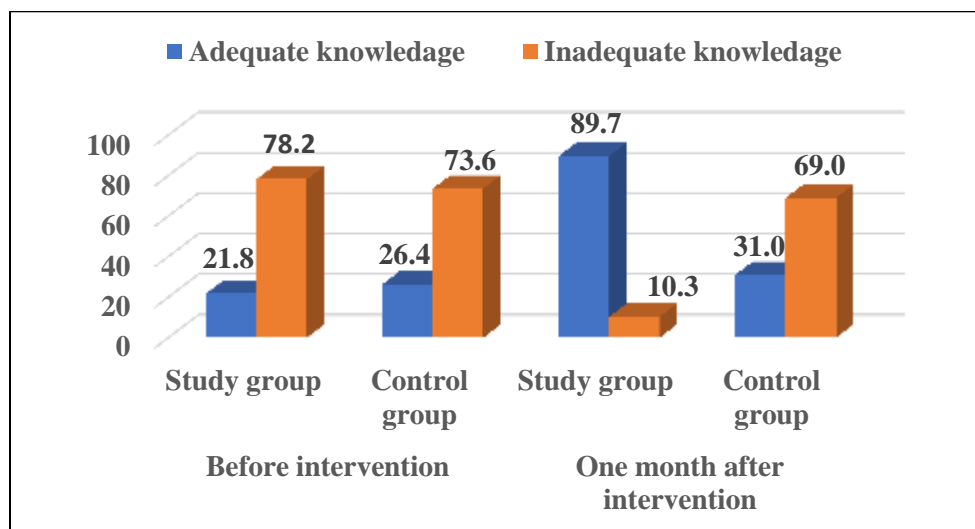
^{ns} non statistical significance difference (p > ٠,٠٥) ^٤ Fisher Exact Test t= independent t-test

Table ٢: Distribution of pregnant women in the study and control groups by obstetrics history (n=١٧٤)

<div>Groups</div> <div>Variables</div>	Study group n=٨٧		Control group n=٨٧		X ^٢ / FET	P-value
	No	%	No	%		
Gravidity						
Primigravidas	٥٩	٦٧,٨	٤٧	٥٤,٠	٣,٤٧٦	٠,٠٦٢ ^{ns}
Multigravida	٢٨	٣٢,٢	٤٠	٤٦,٠		
Gestational age						
First trimester	١٥	١٧,٢	١٧	١٩,٥	١,٥١٤	٠,٤٦٩ ^{ns}
Second trimester	٦٠	٦٩,٠	٦٣	٧٢,٥		
Third trimester	١٢	١٣,٨	٧	٨,٠		

^{ns} non statistical significance difference (p > ٠,٠٥)

^ε Fisher Exact Test



Before educational intervention (p-value = ٠,٤٧٩) One month after educational intervention (p-value = ٠,٠٠١)

Figure ١: Distribution of pregnant women in the two groups by level of the total COVID-١٩ knowledge score before and after one month of educational intervention (n=١٧٤)

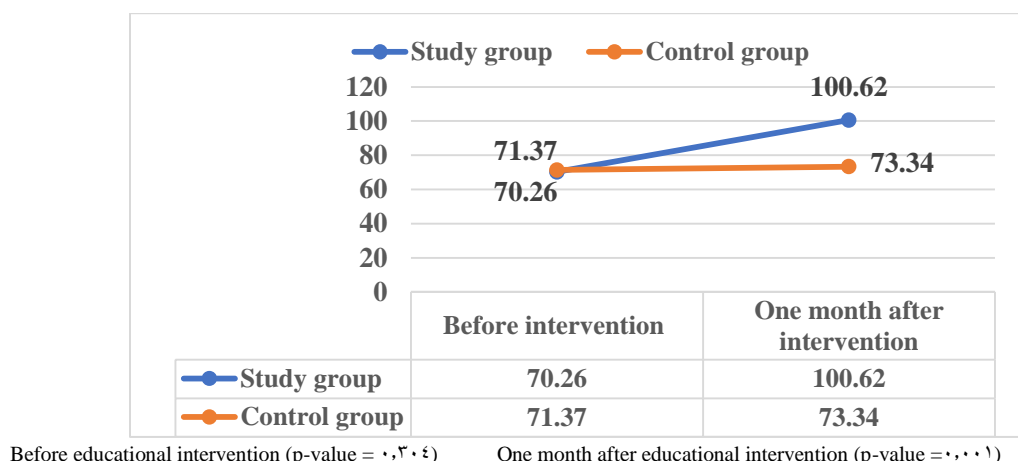
Table ٣: Comparison of mean scores for COVID-١٩ health belief model subscales before and one month after educational intervention in the study and control groups (n=١٧٤)

Subscales	Possible range score	Phases	Study group n=٨٧	Control group n=٨٧	Independent t-test	P-value
			Mean \pm SD	Mean \pm SD		
Perceived susceptibility	٣-١٥	Before intervention	٧,٢٦ \pm ٣,١٤	٧,٩٤ \pm ٢,٨٥	١,٤٩٥	٠,١٣٧ ^{ns}
		One month after intervention	١٣,٢١ \pm ١,٢٨	٨,١٦ \pm ٣,١٠	١٤,٤٠٥	٠,٠٠٠**
Perceived severity	٤-٢٠	Before intervention	٩,٩٨ \pm ١,٦٥	١٠,٣٢ \pm ١,٦١	١,٣٩٢	٠,١٦٦ ^{ns}
		One month after intervention	١٧,١٨ \pm ١,٨٨	١٠,٧٦ \pm ٢,٣٩	١٧,٥٠٧	٠,٠٠٠**
Perceived benefits	٦-٣٠	Before intervention	١٧,٢٩ \pm ٢,٥٣	١٧,٧٩ \pm ٢,٤٤	١,٣٤١	٠,١٨٢ ^{ns}
		One month after intervention	٢٦,١٥ \pm ٢,٥٨	١٨,١٥ \pm ٢,٥٧	٢٠,٧٥٢	٠,٠٠٠**
Perceived barriers	٦-٣٠	Before intervention	٢٧,٩٣ \pm ١,٢٦	٢٧,١٩ \pm ٣,٩٢	١,٦٦٧	٠,٠٩٧ ^{ns}
		One month after intervention	٢١,١١ \pm ١,٢٨	٢٧,٩٢ \pm ٤,٢١	١٤,٤٢٣	٠,٠٠٠**
Perceived self-efficacy	٤-٢٠	Before intervention	٤,٩٧ \pm ٠,٨٢	٥,١٣ \pm ٠,٨٠	١,٢١٣	٠,٢٢٧ ^{ns}
		One month after intervention	١٥,٢٥ \pm ٢,٣٦	٥,٢٨ \pm ٠,٧٤	٣٧,٦٣٥	٠,٠٠٠**
Cues to action	٢-١٠	Before intervention	٢,٨٣ \pm ٠,٨٤	٢,٩٨ \pm ٠,٨٣	١,٢٧٤	٠,٢٠٤ ^{ns}
		One month after intervention	٧,٦٤ \pm ١,٨٢	٣,١٧ \pm ٠,٨٧	٢٠,٧٢١	٠,٠٠٠**

^{ns} non statistical significance difference ($p > ٠,٠٥$)

SD: Standard Deviation

**A high statistical significance difference ($P \leq ٠,٠٠١$).



Before educational intervention (p-value = ٠,٣٠٤)

One month after educational intervention (p-value = ٠,٠٠١)

Figure ٢: Mean overall score of health belief model about COVID-١٩ before and one month after educational intervention in the study and control groups (n=١٧٤)

Table ٤: Distribution of pregnant women's self-reported compliance with COVID-١٩ preventive behaviors in the two groups before and one month after educational intervention (n=١٧٤)

Compliance with	Phases	Study group n=٨٧			Control group n=٨٧			X ² /FET	P-value
		Always No. (%)	Sometimes No. (%)	Never No. (%)	Always No. (%)	Sometimes No. (%)	Never No. (%)		
Wear a mask when going out	Before intervention	١٠ (١١,٥)	٤٦ (٥٢,٩)	٣١ (٣٥,٦)	١٧ (١٩,٥)	٤٣ (٤٩,٤)	٢٧ (٣١,١)	٢,١٩٢	٠,٣٣٤ ns
	One month after intervention	٧٨ (٨٩,٧)	٨ (٩,٢)	١ (١,١)	٢٣ (٢٦,٤)	٤٠ (٤٦,٠)	٢٤ (٢٧,٦)	٧٢,٤٤٤ ^c	٠,٠٠٠***
Wash hands with water and soap for at least ٢٠ seconds or use alcohol sanitizers frequently	Before intervention	٢٥ (٢٨,٧)	٣٤ (٣٩,١)	٢٨ (٣٢,٢)	٣٢ (٣٦,٨)	٢٦ (٢٩,٩)	٢٩ (٣٣,٣)	١,٩٤٤	٠,٣٧٨ ns
	One month after intervention	٨٣ (٩٥,٤)	٤ (٤,٦)	٠ (٠,٠)	٣٦ (٤١,٤)	٣١ (٣٥,٦)	٢٠ (٢٣,٠)	٥٩,٣٩٢ ^c	٠,٠٠٠***
Keep distance of at least one meter from others	Before intervention	١٩ (٢١,٨)	٣٠ (٣٤,٥)	٣٨ (٤٣,٧)	٢٥ (٢٨,٧)	٢٨ (٣٢,٢)	٣٤ (٣٩,١)	١,١١٢	٠,٥٧٤ ns
	One month after intervention	٦٣ (٧٢,٥)	١٥ (١٧,٢)	٩ (١٠,٣)	٣٠ (٣٤,٥)	٢٤ (٢٧,٦)	٣٣ (٣٧,٩)	٢٧,٥٢١	٠,٠٠٠***
Avoid touching eyes, nose, and mouth with hands	Before intervention	٥ (٥,٧)	١٨ (٢٠,٧)	٦٤ (٧٣,٦)	١٠ (١١,٥)	١٥ (١٧,٢)	٦٢ (٧١,٣)	٢,١٧٤	٠,٣١٧ ns
	One month after intervention	٥٨ (٦٦,٧)	٢٥ (٢٨,٧)	٤ (٤,٦)	١٥ (١٧,٢)	١٢ (١٣,٨)	٦٠ (٦٩,٠)	٧٨,٨٩٦	٠,٠٠٠***
Avoid hand shaking and kissing with	Before intervention	١٤ (١٦,١)	٢٦ (٢٩,٩)	٤٧ (٥٤,٠)	٢٠ (٢٣,٠)	١٧ (١٩,٥)	٥٠ (٥٧,٥)	٣,١٣٥	٠,٢١٩ ns
	One month after intervention	٦٠ (٦٩,٠)	٢١ (٢٤,١)	٦ (٦,٩)	٢٢ (٢٥,٣)	١٩ (٢١,٨)	٤٦ (٥٢,٩)	٤٨,٤٧٩	٠,٠٠٠***
Place a tissue or bend elbow in front of the mouth and nose when sneezing or coughing	Before intervention	٣٣ (٣٧,٩)	٣٨ (٤٣,٧)	١٦ (١٨,٤)	٢٩ (٣٣,٣)	٣٧ (٤٢,٥)	٢١ (٢٤,١)	٠,٩٤٧	٠,٦٢٣ ns
	One month after intervention	٧٧ (٨٨,٥)	٨ (٩,٢)	٢ (٢,٣)	٣٥ (٤٠,٢)	٣٤ (٣٩,١)	١٨ (٢٠,٧)	٤٤,٦٤٥ ^c	٠,٠٠٠***
Disinfect surfaces and touched objects such as cell phone	Before intervention	١٢ (١٣,٨)	١٨ (٢٠,٧)	٥٧ (٦٥,٥)	١٥ (١٧,٢)	٢٣ (٢٦,٥)	٤٩ (٥٦,٣)	١,٥٤٧	٠,٤٦١ ns
	One month after intervention	٥٤ (٦٢,١)	٢٦ (٢٩,٩)	٧ (٨,٠)	١٨ (٢٠,٧)	٢٥ (٢٨,٧)	٤٤ (٥٠,٦)	٤٤,٨٦٣	٠,٠٠٠***
Attend antenatal visits at appointments	Before intervention	١٣ (١٤,٩)	١٩ (٢١,٨)	٥٥ (٦٣,٣)	١١ (١٢,٦)	١٦ (١٨,٤)	٦٠ (٦٩,٠)	٠,٥٣٣	٠,٤٦٥ ns
	One month after intervention	٤٥ (٥١,٧)	٣٢ (٣٦,٨)	١٠ (١١,٥)	١٤ (١٦,١)	١٥ (١٧,٢)	٥٨ (٦٦,٧)	٥٦,٣١٩	٠,٠٠٠***
Eat balanced diet	Before intervention	٢٥ (٢٨,٧)	٢٣ (٢٦,٥)	٣٩ (٤٤,٨)	٣٢ (٣٦,٨)	٢١ (٢٤,١)	٣٤ (٣٩,١)	١,٢٩٣	٠,٥٢٤ ns
	One month after intervention	٤٩ (٥٦,٣)	٢٧ (٣١,١)	١١ (١٢,٦)	٣٥ (٤٠,٢)	٢٤ (٢٧,٦)	٢٨ (٣٢,٢)	١٢,٩٢٠	٠,٠٠٠***

Practice regular exercise.	Before intervention	٥ (٥,٧)	١٢ (١٣,٨)	٧٠ (٨٠,٥)	٣ (٣,٤)	١٨ (٢٠,٧)	٦٦ (٧٥,٩)	١,٨٣ ^٤	٠,٤٠٢ ns
	One month after intervention	٤٢ (٤٨,٣)	١٧ (١٩,٥)	٢٨ (٣٢,٢)	٨ (٩,٢)	٢٠ (٢٣,٠)	٥٩ (٦٧,٨)	٣٦,٨٨ ^٤	٠,٠٠٠**
Drink a plenty of water	Before intervention	٣٧ (٤٢,٥)	١٦ (١٨,٤)	٣٤ (٣٩,١)	٣٠ (٣٤,٥)	١٥ (١٧,٢)	٤٢ (٤٨,٣)	١,٥٦٩	٠,٤٤٨ ns
	One month after intervention	٦٩ (٧٩,٣)	١٤ (١٦,١)	٤ (٤,٦)	٣٨ (٤٣,٧)	١٣ (١٤,٩)	٣٦ (٤١,٤)	٣٤,٦١ ^٤	٠,٠٠٠**
Wash fruits and vegetables properly	Before intervention	٣٤ (٣٩,١)	٢٤ (٢٧,٦)	٢٩ (٣٣,٣)	٣٧ (٤٢,٥)	١٩ (٢١,٨)	٣١ (٣٥,٧)	٠,٧٧٥	٠,٦٧٩ ns
	One month after intervention	٥٠ (٥٧,٥)	٣٥ (٤٠,٢)	٢ (٢,٣)	٤١ (٤٧,٢)	٢١ (٢٤,١)	٢٥ (٢٨,٧)	٢٣,٩٨ ^٤	٠,٠٠٠**
Maintain adequate sleep	Before intervention	٢٨ (٣٢,٢)	١٨ (٢٠,٧)	٤١ (٤٧,١)	٢٥ (٢٨,٧)	٢٣ (٢٦,٥)	٣٩ (٤٤,٨)	٠,٨٣٠	٠,٦٦٠ ns
	One month after intervention	٦٦ (٧٥,٩)	١٣ (١٤,٩)	٨ (٩,٢)	٢٧ (٣١,١)	٢٢ (٢٥,٣)	٣٨ (٤٣,٧)	٣٨,٢٣ ^٤	٠,٠٠٠**
Avoid areas with covid-١٩ cases	Before intervention	٤٤ (٥٠,٦)	١٧ (١٩,٥)	٢٦ (٢٩,٩)	٤٨ (٥٥,٢)	١٤ (١٦,١)	٢٥ (٢٨,٧)	٠,٤٨٤	٠,٧٨٥ ns
	One month after intervention	٨١ (٩٣,١)	٦ (٦,٩)	٠ (٠,٠)	٥٣ (٦١,٠)	١٣ (١٤,٩)	٢١ (٢٤,١)	٢٩,٤٣ ^٤	٠,٠٠٠**

^{ns} non statistical significance difference ($p > ٠,٠٥$)

^٤Fisher Exact Test

**A high statistical significance difference ($P \leq ٠,٠٠١$).

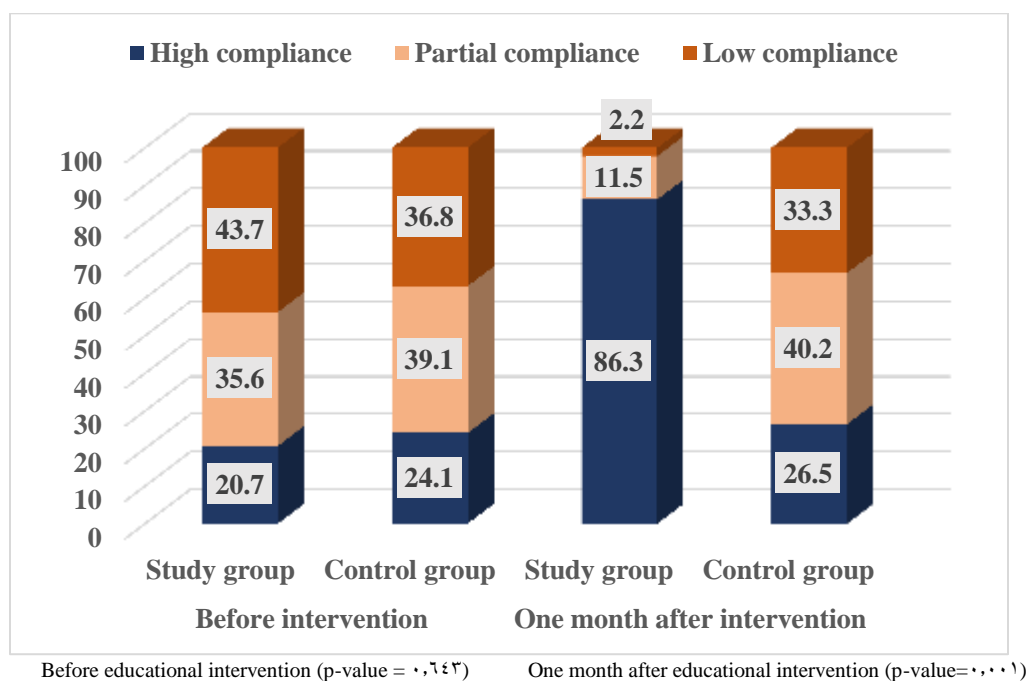


Figure ٣: Distribution of the level of total self-reported compliance with COVID-١٩ preventive behaviors by pregnant women in two groups before and after one month of educational intervention (n = ١٧٤)

Table ٥: Correlation coefficient between scores of total knowledge, health belief model, and self-reported compliance with COVID-١٩ preventive behaviors in study and control groups before and one month after the educational intervention (n=١٧٤)

Variables	Phases	Total knowledge score			
		Study group		Control group	
		r	p	r	P
Overall health belief model score	Before intervention	٠,٥٦٢	٠,٠٠٢**	٠,٣٢٥	٠,٠٠٣**
	One month after intervention	٠,٦٩٨	٠,٠٠٠**	٠,٤١٣	٠,٠٠١**
Total score of self-reported compliance with COVID-١٩ preventive behaviors	Before intervention	٠,٦٥٤	٠,٠٠٠**	٠,٧٥٤	٠,٠٠٠**
	One month after intervention	٠,٧٢٦	٠,٠٠٠**	٠,٨٦٣	٠,٠٠٠**

**A high statistical significance difference ($P \leq ٠,٠٠١$).

Table ٦: Correlation coefficient between scores of total health belief model and self-reported compliance with COVID-١٩ preventive behaviors in study and control groups before and one month after the educational intervention (n=١٧٤)

Variables	Phases	Overall health belief model score			
		Study group		Control group	
		r	p	r	p
Total compliance with preventive behaviors score	Before intervention	٠,٨١٤	٠,٠٠١**	٠,٦٤٩	٠,٠٠١**
	One month after intervention	٠,٨٣٢	٠,٠٠١**	٠,٥٩٥	٠,٠٠١**

**A high statistical significance difference ($P \leq ٠,٠٠١$).

Discussion

The beliefs and behavioral responses of the general population, particularly pregnant women, are crucial in preventing and controlling COVID-١٩ outbreak. The HBM is one of the effective health education models, focusing primarily on preventing illnesses and adopting behaviors to avoid diseases. In addition, HBM is used to study the relationship between beliefs and health behaviors^(١٣,٣٥). Adequate knowledge has been shown to be a prerequisite for establishing a preventive belief, forming a positive disease prevention and management behaviors^(٣٦,٣٧). Therefore, this study aimed

to investigate the effect of health belief model-based educational intervention on COVID-١٩ preventive behaviors among pregnant women.

The results of the current study found no statistically significant differences in the demographic features of the pregnant women in the study and control groups. Around half of the study and control groups were between the ages of ٢٥ and ٣٠, with mean ages of $٢٦,٥٤ \pm ٢,٣١$ and $٢٧,٧٤ \pm ٢,١٢$ years old, respectively. Also, less than half of the two groups completed secondary education and nearly two-thirds of the study and control groups were housewives. While more than

three-quarters of the two groups resided in rural areas. The majority of both groups had insufficient monthly income. The results indicated that the two groups were homogeneously distributed. These are similar to Sabry et al., (2021)⁽³⁸⁾ revealed that more than half of women aged 20 to < 30 years old had a mean age of 26.97 ± 2.76 years, and more than two-thirds of them resided in rural areas and were unemployed. According to Degu et al., (2021)⁽³⁹⁾ 96.9% of pregnant women were between the ages of 20 and 34, with a mean age of 27.19 ± 4.72 years. These results are in accordance with Omozuwa et al., (2020)⁽⁴⁰⁾ mentioned that 92.4% of pregnant women had completed secondary school. Abdelhafiz et al., (2020)⁽⁴¹⁾ found that approximately half of the study participants had inadequate income.

The study findings showed that more than two-thirds of the pregnant women in the study group as well as more than half of the control group were primigravidas. More than two-thirds of both groups were pregnant in the second trimester. These are supported by Sabry et al., (2021)⁽³⁸⁾ found nearly half of women were primigravida with a gestational age between 20 to 30 weeks. Kumbeni et al., (2021)⁽⁴²⁾ the majority of women get pregnant in the second trimester.

The current study finding demonstrated that nearly a quarter of the two groups had adequate knowledge about COVID-19 before the educational intervention. This is consistent with Nicholas et al., (2020)⁽⁴³⁾ stated that 21.9% of the subjects had correct knowledge about COVID-19 infection. Other studies have found similar results, for instance, participants in studies conducted in Turkey Yıldırım and Güler, (2020)⁽⁴⁴⁾ and Bangladesh Ferdous et al., (2020)⁽⁴⁵⁾ reported low levels of COVID-19-related knowledge. Also, Nwafor et al., (2020)⁽⁴⁶⁾ and Zhong et al., (2020)⁽⁴⁷⁾ demonstrated that occupation, educational level, and place of residence are predictors for knowledge scores. As such, individuals with low educational level and unemployment have lower knowledge scores. Inadequate knowledge in the present study could be due to COVID-19 is a new and unknown disease, as well as the demographic characteristics of women in both groups, may explain the lack of knowledge. Pregnant women in rural areas with secondary education and housewives may have limited access to up-to-date information and gain more knowledge about COVID-19.

In contrast, Fikadu et al., (2021)⁽⁴⁸⁾ noticed that 94.8% of pregnant women attending hospitals in Guraghe Zone Southern Ethiopia

had adequate knowledge about COVID-19 prevention measures. Serwaa et al., (2020)⁽⁴⁹⁾ found that knowledge of pregnant women in Ghana were 62.7%. In Uganda, 69% of pregnant women who had received prenatal care aware about COVID-19 (Olum and Bongomin, 2020)⁽⁵⁰⁾. Also, Maharlouei et al., (2020)⁽⁵¹⁾ found that 90% of the participants had an acceptable level of knowledge about COVID-19. The disparity could be attributed to differences in study cultures and efforts by healthcare systems to raise awareness about COVID-19.

However, after one month of the educational intervention, the majority of the study group had an adequate level of knowledge, compared to less than a third of the control group. This finding could be attributed to the effectiveness of the educational intervention in increasing women's knowledge about COVID-19 and interest in the topics presented. This finding supported by Sabry et al., (2021)⁽⁵²⁾ showed that three-quarters of women had a poor level of knowledge about the COVID-19 pre-educational program, compared to 93.0% of women who had a good level of knowledge post-educational program, with a high statistically significant difference ($p < 0.001$).

Concerning pregnant women's health beliefs regarding COVID-19, the study results indicated that the mean scores of the overall health belief model and subscales were similar before the educational intervention in both groups, with no statistically significant differences observed. Nonetheless, after one month of the educational intervention, the mean scores of the overall health belief model and subscales, namely, perceived susceptibility, perceived severity, perceived benefits, perceived self-efficacy, as well as cues to action, were significantly higher in the study group than in the control group, whereas the mean score of perceived barriers was significantly lower. These findings might be due to improving pregnant women's knowledge regarding COVID-19 by an effective educational intervention which in turn enhanced positive health beliefs regarding COVID-19 prevention.

These findings are comparable to Mehanna et al., (2021)⁽⁵³⁾ who emphasized those efforts should be directed to educate individuals about the necessity of adhering to preventive measures. knowing the importance of each protective action in preventing infection with the novel COVID-19 virus, as well as the disease's potentially devastating consequences would undoubtedly encourage individuals to

adhere to the preventive measures. According to Lee et al., (2020)⁽²⁷⁾ the perceived benefits and severity of preventive health behaviors related to COVID-19 are important indicators. Also, the findings of Alagili and Bamashmous (2021)⁽²⁸⁾ pointed out that the best model structures for predicting adherence to COVID-19 preventive practices during the outbreak were perceived benefits, perceived barriers, and cues to action.

Regarding self-reported compliance with COVID-19 preventive behaviors, the current study found that before the HBM-based educational intervention, nearly a quarter of the pregnant women in both groups were highly compliant with COVID-19 preventive behaviors, with no statistically significant differences in all items of preventive behaviors between the two groups. These findings are in the same line with Metwally and Desoky, (2020)⁽²⁴⁾ found that only 12.4% of pregnant women had a satisfactory practice level for COVID-19 infection prevention measures, and 87.6% of women had an unsatisfactory level of total practice. These findings are also slightly consistent with those of another study by Nwafor et al., (2020)⁽²⁶⁾ noticed that 79.7% of pregnant women have poor practices of preventive measures against COVID-19 virus. The low compliance

with COVID-19 preventive behaviors could be due to a variety of reasons including inadequate knowledge, negative beliefs, the high expense of protective equipment such as face masks, and hand sanitizers.

On the contrary, Kumbeni et al., (2021)⁽²⁹⁾ found that 46.6% of the pregnant women were engaged in COVID-19 preventive practices. Also, Ayele et al., (2020)⁽³²⁾; Kamal et al., (2020)⁽³⁰⁾ and Omozuwa et al., (2020)⁽³¹⁾ indicated that 47.6%, 30.3%, and 44.1% of pregnant women, respectively, had good practices of COVID-19 prevention. In addition, Besho et al., (2021)⁽³³⁾ proved that 42.6 percent of participants applied good COVID-19 infection prevention strategies. The women's responses to infection prevention methods for COVID-19 included using a face mask (88.2%), washing hands frequently (90.6%), covering the mouth with a bent elbow when coughing or sneezing (91.8%), avoiding shaking hands with others (87.7%), and maintaining a physical distance (73.7 %). Also, Anikwe et al. (2020)⁽³⁴⁾ showed most pregnant women wear masks, wash hand, avoid touching the face, and quarantine the infected people as good COVID-19 infection prevention practices.

Conversely, after one month of HBM-based educational intervention, the majority of the

study group demonstrated high compliance with COVID-١٩ preventative behaviors, compared to more than a quarter of the control group, and a highly statistically significant difference was found between the two groups. This can be attributed to that the HBM-based educational intervention made pregnant women in the study group believe and feel more vulnerable, understand the consequences and severity of COVID-١٩ infection, recognize the negative pregnancy outcomes linked to COVID-١٩ infection as well as have increased motivation and tendency to engage in preventive behaviors, along with reinforced confidence in overcoming barriers. This was reflected in the pregnant women's engagement and compliance with the recommended preventive behaviors for COVID-١٩.

These findings are compatible with the results of Duan et al., (٢٠٢٠) ^(٥٨) point out that the perception of risk is largely related to the acceptance of the recommendations for preventive measures for COVID-١٩. Kim and Kim, (٢٠٢٠) ^(٥٩) demonstrated that a greater perceived understanding of COVID-١٩ is related to more social distancing behaviors. Those with a thorough comprehension of COVID-١٩ followed the authorities' guidelines for infection prevention and

engaged in good practices (٩٣,٨٪). Also, Al-Hanawi et al., (٢٠٢٠) ^(٦٠) stated that good knowledge of participants about COVID-١٩ infection is translated into effective and safe practices during the pandemic.

The results of present study revealed a significant positive correlation between overall knowledge, health belief model, and self-reported compliance with COVID-١٩ preventive behaviors scores in both groups before and one month after the HBM-based educational intervention. This could be due to pregnant women with adequate knowledge had more positive perceptions and health beliefs about the prevention of COVID-١٩ and practiced more preventive behaviors. Compatible with these findings, Zhang et al., (٢٠٢٠) ^(٦١) indicated a positive association between COVID-١٩ knowledge and practices among participants. Shiina et al., (٢٠٢٠) ^(٦٢) found that participants with poorer levels of knowledge were less likely to perform COVID-١٩ preventive behavior. Zhong et al., (٢٠٢٠) ^(٦٣) demonstrated that COVID-١٩ knowledge is substantially associated with greater preventive measures. In addition, W/Mariam et al., (٢٠٢٠) ^(٦٤) revealed that pregnant women with good understanding regarding COVID-١٩ were ٢,٣ times more likely than counterparts to have good

preventive practices. In contrast, Barakat and Kasemy, (٢٠٢٠) ^(٢١) reported a correlation between participants' knowledge and engaging in preventive behaviors.

Furthermore, there was a significant positive correlation between the scores of overall the health belief model and self-reported COVID-١٩ preventive behaviors compliance in both groups before and one month after the educational intervention. This may be attributed to the HBM-based educational intervention had a positive effect on health beliefs that could significantly influence the protective behaviors of pregnant women. This signifies that increased self-reported compliance with COVID-١٩ preventive behaviors was associated with an improvement in pregnant women's health beliefs.

This is in congruence with the study by Alsulaiman and Rentner (٢٠٢١) ^(٢٤) revealed that participants with higher scores on the health belief model were more probable than those with lower scores to adhere to COVID-١٩ preventive measures. Nowak et al., (٢٠٢٠) ^(٢٥) stated that individuals who have low belief in the susceptibility plus severity of COVID-١٩ are less willing to practice COVID-١٩ preventive behaviors. Also, Halimatunnisa et al., (٢٠٢١) ^(٢٦) mentioned that the adoption of

preventive behaviors increases with perceived severity, risk, and vulnerability. Mehanna et al., (٢٠٢١) ^(٢٧) highlighted that willingness to comply to COVID-١٩ preventive measures were considerably associated with all constructs of the HBM.

In contrast, Yıldırım and Guler, (٢٠٢٠) ^(٢٨) pointed out that participants with a lower perception of the severity of the disease demonstrated greater preventative. This discrepancy can be attributed to demographic characteristics of the study participants.

Conclusion

The study's findings concluded that the application of the health belief model-based educational intervention was effective in improving the knowledge and health beliefs, as well as self-reported compliance with COVID-١٩ preventive behaviors of pregnant women in the study group compared to the control group. Thus, the aim was achieved, and research hypotheses were supported.

Recommendations

The following recommendations are proposed based on the findings of the present study:

- Provide continuous educational programs based on the health belief model to enhance pregnant women's knowledge and compliance with COVID-١٩ pandemic preventive behaviors.

- Emphasize the necessity of following COVID-١٩ preventative precautions during standard antenatal care instructions.
 - Determine predictors of compliance with COVID-١٩ preventive behaviors in pregnant women using HBM.
- Further studies:
- Identify barriers to COVID-١٩-related health behaviors during pregnancy by applying the health belief model.
 - Examine the impact of health belief model-based education on pregnant women's intention to get the COVID-١٩ vaccine.

References

١. Mullins E, Evans D, Viner R, O'Brien P, and Morris E. Coronavirus in pregnancy and delivery: Rapid review and expert consensus. medRxiv. ٢٠٢٠;٤-١٣.
٢. Englund JA, and Chu HY. Respiratory virus infection during pregnancy: Does it matter? J Infect Dis. ٢٠١٨; ٢١٨: ٥١٢-٥١٥.
٣. World Health Organization(WHO). Coronavirus disease (COVID-١٩) pandemic [Internet] Available at: <http://www.euro.who.int/en/health-topics/healthemergencies/coronavirus-covid-١٩/novelcoronavirus-٢٠١٩-ncov>.

٤. Costantine MM, Landon MB, and Saade GR. Protection by exclusion: Another missed opportunity to include pregnant women in research during the corona virus disease ٢٠١٩ (COVID-١٩) pandemic. Obstetrics and Gynecology. ٢٠٢٠; ١٣٦(١): ٢٦-٢٨.
٥. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J et al. A novel coronavirus from patients with pneumonia in China, ٢٠١٩. N Engl J Med. ٢٠٢٠; ٣٨٢:٧٢٧-٧٣٣.
٦. Corbett GA, Milne SJ, Hehir MP, Lindow SW, and O'Connell MP. Health anxiety and behavioral changes of pregnant women during the COVID-١٩ pandemic, Eur. J. Obstet. Gynecol. Reprod. Biol. ٢٠٢٠; ٢٤٩:٩٦-٩٧.
٧. Di Mascio D, Khalil A, Saccone G, Rizzo G, and Buca DLM. Outcome of coronavirus spectrum infections (SARS, MERS, COVID-١٩) during pregnancy: A systematic review and metanalysis. Am J Obs Gynecol. ٢٠٢٠; ٢:١٠٠-١٠٧.

٨. Huntley BJF, Huntley ES, Di Mascio D, Chen T, and Berghella VCS. Rates of maternal and perinatal mortality and vertical transmission in pregnancies complicated by severe acute respiratory syndrome coronavirus ٢ (SARS-Co-V-٢) infection: A systematic review. *Obs Gynecol.* ٢٠٢٠;١٢: ١٣٦–٣٠٣.
٩. Shaw R, Kim Y-k, and Hua J. Governance, technology, and citizen behavior in pandemic: lessons from COVID-١٩ in East Asia. *Prog Disaster Sci.* ٢٠٢٠;٦: ١٠٠٠٩٠.
١٠. Darabi F, Kaveh MH, Khalajabadi Farahani F, Yaseri M, Majlessi F, and Shojaeizadeh D. The effect of a theory of planned behavior-based educational intervention on sexual and reproductive health in Iranian adolescent girls: A randomized controlled trial. *J Res Health Sci.* ٢٠١٧;١٧(٤): e٠٠٤٠٠.
١١. Zareipour M, Ardakani MF, Moradali MR, Jadgal MS, and Movahed E. Determinants of COVID-١٩ prevention behavior in the elderly in Urmia: application of health belief model. *Open Access Maced J Med Sci.* ٢٠٢٠; ٢٥ (٨):٦٤٦-٦٥٠.
١٢. Glanz K, Rimer BK, and Lewis FM. Health behavior and health education, theory, research, and practice. ٣rd ed. San Francisco, California: Jossey Bass. ٢٠١٥.
١٣. Carico RR, Sheppard J, and Thomas CB. Community pharmacists and communication in the time of COVID-١٩: Applying the health belief model. *Res Social Adm Pharm.* ٢٠٢١; ١٧(١):١٩٨٤-١٩٨٧.
١٤. Mirzaei A, Kazembeigi F, Kakaei H, Jalilian M, Mazloomi S, and Nourmoradi H. Application of health belief model to predict COVID-١٩-preventive behaviors among a sample of Iranian adult population. *J Edu Health Promot.* ٢٠٢١; ١٠:٦٩.
١٥. World Health Organization, Myth Busters. Geneva, Switzerland: WHO. Available at: https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/webmythbusters/mythbuster-٤.png?sfvrsn=e١٦٣bada_٨. ٢٠٢٠. Accessed December ٥, ٢٠٢٠.

16. Kwok KO, Li KK, Chan HH, Yi YY, Tang A, Wei WI, Wong, S. Community responses during the early phase of the COVID-19 epidemic in Hong Kong: Risk perception, information exposure and preventive measures. medRxiv. 2020;26(7):1070-1079.
17. Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, Xing F, Liu J, Yip CC, Poon RW, Tsoi HW, Lo SK, Chan KH, Poon VK, Chan WM, Ip JD, Cai JP, Cheng VC, Chen H, Hui CK, and Yuen KY. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: A study of a family cluster. Lancet. 2020; 395(10223):014-023.
18. Chaleoykitti S, and Srisawad K. Nurses' role in taking care of pregnant women at risk of coronavirus infection. Journal of the police nurses. 2020; 12(1):210-221.
19. Rothan HA, and Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. J Autoimmun. 2020; 109:102433.
20. Struyf T, Deeks JJ, Dinnes J, Takwoingi Y, Davenport C, Leeflang MMG, Spijker R, Hooft L, Emperador D, Dittich S, Domen J, Horn SR A, and Van den Bruel A. Signs and symptoms to determine if a patient presenting in primary care or hospital outpatient settings has COVID-19 disease. Cochrane Database of Systematic Reviews 2020; 7: CD013770. DOI: 10.1002/14651858.CD013770.
21. Lai CC, Shih TP, Ko WC, Tang HJ, and Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. Int J Antimicrob Agents. 2020; 00:1-9.
22. Gujski M, Humeniuk E, and Bojar I. Current state of knowledge about SARS-CoV-2 and COVID-19 disease in pregnant women. MedSciMonit. 2020; 26: e924720.
23. Dashboard Coronavirus COVID-19 (Mobile)|ArcGIS Hub n.d. <https://hub.arcgis.com/datasets/80320e2ea0424dfaaa70ae72e0c7e71,2021>. Accessed May 20, 2021.

٢٤. World Health Organization (WHO). COVID-١٩ Weekly Epidemiological Update. Available online at: <https://www.who.int/publications/m/item/weekly-epidemiological-update-٢٠٢١>. Accessed June^٩, ٢٠٢١.
٢٥. Juan J, and Gil MM. Effect of coronavirus disease ٢٠١٩ (COVID-١٩) on maternal, perinatal and neonatal outcome: systematic review. *Ultrasound Obstetr Gynecol*. ٢٠٢٠;٥٦ (١):١٥-٢٧.
٢٦. Yamane T. *Statistics: An Introductory Analysis*, ٢nd Ed., New York: Harper and Row. ١٩٦٧.
٢٧. Statistical Center of Benha University Hospital: Annual records of obstetric department. ٢٠١٩.
٢٨. Maharlouei N, Asadi N, Bazrafshan K, Roozmeh S, Rezaianzadeh A, Zahed-Roozegar MH, Shaygani F, Kharmandar A, Honarvar B, Hemyari C, Omidifar N, Zare M, and Lankarani KB. Knowledge and attitude regarding covid-١٩ among pregnant women in Southwestern Iran in the early period of its outbreak: A cross-sectional study. *Am J Trop Med Hyg*. ٢٠٢٠;١٠٣(٦):٢٣٦٨-٢٣٧٥.
٢٩. Nasir EF, Yagoub HMA, and Alhag AK. Study of the Sudanese perceptions of COVID-١٩: Applying the Health Belief Model. *medRxiv*. ٢٠٢٠;٠٥,٢٨,٢٠١١٥٤٧٧.
٣٠. Shahnazi H, Ahmadi-Livani M, Pahlavanzadeh B, Rajabi A, Hamrah MS, and Charkazi A. Assessing preventive health behaviors from COVID-١٩: A cross sectional study with health belief model in Golestan Province, Northern of Iran. *Infect Dis Poverty*. ٢٠٢٠;١٧;٩(١):١٥٧.
٣١. Barakat AM, Kasemy ZA. Preventive health behaviors during coronavirus disease ٢٠١٩ pandemic based on health belief model among Egyptians. *Middle East Curr Psychiatry*. ٢٠٢٠; ٢٧:٤٣.
٣٢. AyeleAD, Mihretie GN, Belay HG, Teffera AG, Kassa BG, and Amsalu BT. Knowledge and practice to prevent against corona virus disease (COVID-١٩) and its associated factors among pregnant women in Debre Tabor Town Northwest Ethiopia: a community based Cross-Sectional Study. *Res Sq*. ٢٠٢٠;١-٢٨.
٣٣. Centers for Disease Control and Prevention. Pregnancy and

- Breastfeeding.
<https://www.cdc.gov/coronavirus/٢٠١٩-ncov/need-extra-precautions/pregnancybreastfeeding.html>. ٢٠٢٠. Accessed January ١٤, ٢٠٢١.
٣٤. World Health Organization (WHO) Q&A on coronaviruses (COVID-١٩).<https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>. ٢٠٢٠. Retrieved May ٣٠, ٢٠٢٠.
٣٥. Shabibi P, Zavareh MSA, Sayehmiri K, Qorbani M, Safari O, Rastegarimehr B, and Mansourian M. Effect of educational intervention based on the health belief model on promoting self-care behaviors of type-٢ diabetes patients. Electron Physician. ٢٠١٧;٩(١٢):٥٩٦٠-٥٩٦٨.
٣٦. Gao J, Tian Z, and Yang X. Breakthrough: Chloroquine phosphate has shown apparent efficacy in treatment of COVID-١٩ associated pneumonia in clinical trials. Bioscience Trend. ٢٠٢٠;١٤: ٧٢-٧٣.
٣٧. Sun X, Li S, Li K, and Hu X. Pharmaceutical care of chloroquine phosphate in elderly patients with coronavirus pneumonia (COVID-١٩). Aging Med. ٢٠٢٠;٣: ٩٨-١٠١.
٣٨. Sabry FA, Mohamed AA, Ghanem NM, Abd El-aty NS, and Ahmed NH. Effect of WhatsApp educational program reminder on pregnant women's knowledge, attitude and practice regarding COVID -١٩ pandemic. Egyptian Journal of Health Care. ٢٠٢١; ١٢(٣): ١١٦-١٣٠.
٣٩. Degu A, Nibret G, Gebrehana H, Getie A, and Getnet B. Knowledge and attitude towards the current pandemic corona virus disease and associated factors among pregnant women attending antenatal care in Debre Tabor general hospital Northwest Ethiopia: An institutional-based cross-sectional study. Int J Women's Health. ٢٠٢١; ٨(١٣): ٦١-٧١.
٤٠. OmozuwaES, Uwaibi NE, and Erhabor JO. Level of practice of safety precautions against COVID ١٩ among pregnant women attending antenatal clinics in central hospital Benin, Benin City in Nigeria. Journal of Applied Sciences & Environmental Management. ٢٠٢٠; ٢٤ (١١): ١٩٢٥-١٩٣١.
٤١. Abdelhafiz AS, Mohammed Z, Ibrahim ME, Ziady HH, Alorabi M, Ayyad M, and Sultan EA. Knowledge,

- perceptions, and attitude of Egyptians towards the novel coronavirus disease (COVID-١٩). J Community Health. ٢٠٢٠;٤٥(٥):٨٨١-٨٩٠.
٤٢. Kumbeni MT, Apanga PA, Yeboah EO, and Lettor IBK. Knowledge and preventive practices towards COVID-١٩ among pregnant women seeking antenatal services in Northern Ghana. PLoS ONE. ٢٠٢١; ١٦(٦): e٠٢٥٣٤٤٦.
٤٣. Nicholas T, Mandaah FV, Esemu SN, Vanessa AB, Gilchrist KT, Vanessa LF, and Shey ND. COVID-١٩ knowledge, attitudes and practices in a conflict affected area of the Southwest Region of Cameroon. Pan Africa Medical Journal. ٢٠٢٠;٣٥(٢):٣٤.
٤٤. Yildirim M, and Guler A. COVID-١٩ severity, self-efficacy, knowledge, preventive behaviors, and mental health in Turkey. Death Stud. ٢٠٢٠; ١٦:١-٨.
٤٥. Ferdous MZ, Islam MS, Sikder MT, Mosaddek ASM, Zegarra-Valdivia J, and Gozal D. Knowledge, attitude, and practice regarding COVID-١٩ outbreak in Bangladesh: An online-based cross-sectional study. PloS one. ٢٠٢٠; ١٥: e٠٢٣٩٢٥٤.
٤٦. Nwafor JI, Aniukwu JK, Anozie BO, Ikeotuonye AC, and Okedo-Alex IN. Pregnant women's knowledge and practice of preventive measures against COVID-١٩ in a low-resource African setting. Int J Gynaecol Obstet. ٢٠٢٠;١٥٠(١):١٢١-١٢٣.
٤٧. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, and Li Y. Knowledge, attitudes, and practices towards COVID-١٩ among Chinese residents during the rapid rise period of the COVID-١٩ outbreak: a quick online cross-sectional survey. Int J Biol Sci. ٢٠٢٠; ١٦(١٠):١٧٤٥-١٧٥٢.
٤٨. Fikadu Y, Yeshaneh A, Melis T, Mesele M, Anmut W, and Argaw M. COVID-١٩ preventive measure practices and knowledge of pregnant women in Guraghe Zone hospitals. Int J Women's Health. ٢٠٢١; ١٣:٣٩-٥٠.
٤٩. Serwaa D, Lamptey E, Appiah AB, Senkyire EK, and Ameyaw JK. Knowledge, risk perception and preparedness towards coronavirus disease-٢٠١٩ (COVID-١٩) outbreak among Ghanaians: a quick online cross-sectional survey. Pan Afr Med J. ٢٠٢٠; ٣٥:١-٧.

٥٠. Olum R, and Bongomin F. Coronavirus disease-٢٠١٩: knowledge, attitude, and practices of health care workers at Makerere University Teaching Hospitals. *Front Public Health*. ٢٠٢٠; ٨:١-٩.
٥١. Mehanna A, Elhadi YAM, and Lucero-Prisno DE. Public willingness to adhere to COVID-١٩ precautionary measures in Sudan: An application of the health belief model. *Pan African Medical Journal*. ٢٠٢١; ٣٩:١٣٥.
٥٢. Lee M, and You M. Psychological and behavioral responses in South Korea during the early stages of coronavirus disease ٢٠١٩ (COVID-١٩). *Int J Environ Res Public Health*. ٢٠٢٠; ١٧(٩): ٢٩٧٧.
٥٣. Alagili DE, and Bamashmous M. The health belief model as an explanatory framework for COVID-١٩ prevention practices. *J Infect Public Health*. ٢٠٢١; ١٤(١٠): ١٣٩٨-١٤٠٣.
٥٤. Metwally HMS, and Desoky MMAEM. Knowledge, practice, and attitudes of preventive measures against coronavirus infection among pregnant women in Egypt. *Saudi Journal of Nursing and Health Care*. Saudi J Nurs Health Care. ٢٠٢٠; ٣(٦): ١٥٦-١٦٦.
٥٥. Kamal D, Thakur VD, Swain SK, and Vikneshram CR. Knowledge, attitude, and practice toward COVID-١٩ among pregnant women in a tertiary care hospital during the COVID-١٩ outbreak. *Journal of Marine Medical Society*. ٢٠٢٠; ٢٢(٣): ٦٦-٧١.
٥٦. Besho M, Tsegaye R, Yilma MT, Kasaye HK, Tolossa T, Hiko N, Markos J, Mulisa D, Hasen T, and Wakuma B. Knowledge, attitude, and practice toward corona virus infection among pregnant women attending antenatal care at public hospitals in three Wollega Zones, Ethiopia. *Int J Gen Med*. ٢٠٢١; ١٤: ٣٥٦٣-٣٥٧٣.
٥٧. Anikwe CC, Ogah CO, Anikwe IH, Okorochukwu BC, and Ikeoha CC. Coronavirus disease ٢٠١٩: Knowledge, attitude, and practice of pregnant women in a tertiary hospital in Abakaliki, Southeast Nigeria. *Int J Gynecol Obstet*. ٢٠٢٠; ١٥١(٢): ١٩٧-٢٠٢.
٥٨. Duan T, Jiang H, Deng X, Zhang Q, and Wang F. Government intervention, risk perception, and the adoption of protective action

- recommendations: Evidence from the COVID-١٩ prevention and control experience of China. *Int. J. Environ. Res. Public Health*. ٢٠٢٠;١٧(١٠):٣٣٨٧.
٥٩. Kim S, and Kim S. Analysis of the impact of health beliefs and resource factors on preventive behaviors against the COVID-١٩ pandemic. *Int. J. Environ. Res. Public Health*. ٢٠٢٠; ١٧(٢٢): ٨٦٦٦.
٦٠. Al-Hanawi MK, Angawi K, Alshareef N, Qattan AMN, Helmy HZ, Abudawood Y, Alqurashi M, Kattan WM, Kadasah NA, Chirwa GC, and Alsharqi O. Knowledge, attitude, and practice toward COVID-١٩ among the public in the Kingdom of Saudi Arabia: A cross-sectional study. *Front. Public Health*. ٢٠٢٠; ٨:٢١٧.
٦١. Zhang M, Zhou M, Tang F, Wang Y, Nie H, Zhang L, and You G. Knowledge, attitude, and practice regarding COVID-١٩ among healthcare workers in Henan, China. *J Hosp Infect*. ٢٠٢٠;١٠٥(٢):١٨٣-١٨٧.
٦٢. Shiina A, Niitsu T, Kobori O, Idemoto K, Hashimoto T, Sasaki T, Igarashi Y, Shimizu E, Nakazato M, and Hashimoto K. Relationship between perception and anxiety about COVID-١٩ infection and risk behaviors for spreading infection: A national survey in Japan. *Brain, Behavior, & Immunity-Health*. ٢٠٢٠; ٦:١٠٠١٠١.
٦٣. W/Mariam TGM, Kassie BA, Asratie MH, and Abate AT. The effects of fear and knowledge of COVID-١٩ on preventive practice among pregnant women who attend antenatal care in Northwest Ethiopia, ٢٠٢٠: Institution-based cross-sectional study. *Int J Women's Health*. ٢٠٢١;١٣: ٩٥-١٠٠.
٦٤. Alsulaiman SA, and Rentner TL. The use of the health belief model to assess U.S. college students' perceptions of COVID-١٩ and adherence to preventive measures. *J Public Health Res*. ٢٠٢١. doi: ١٠.٤٠٨١/jphr.٢٠٢١,٢٢٧٣.
٦٥. Nowak B, Brzoska P, Piotrowski J, Sedikides C, Zemojtel-Piotrowska M, and Jonason PK. Adaptive and maladaptive behavior during the COVID-١٩ pandemic: The roles of Dark Triad traits, collective narcissism, and health beliefs. *Pers Individ Dif*. ٢٠٢٠; ١٦٧:١١٠٢٣٢.

٦٦. Halima tunnisa M, Lestari P, and Ulfiana E. Beliefs and the correlation with protection health behaviors COVID-١٩: A systematic review. Journal Keperawatan. ٢٠٢١;١٣(٣): ٦٠٥-٦١٤.

Assessment of Nurse's Knowledge and attitude regarding WHO breastfeeding guideline during COVID-١٩

'Asmaa AnwarAbdelgilil, 'Heba Ibrahim Mohamed' 'Nagwa Ibrahim Elfeshawy

'Lecturer of Woman's Health and Midwifery Nursing, Faculty of nursing, Kafrelsheikh University

'Lecturer of pediatric nursing, Faculty of nursing, Kafrelsheikh University

'Lecturer of Woman's Health and Midwifery Nursing, Faculty of Nursing, Mansoura University.

Abstract

Background: Nurses are the first line of defense during the current world wide pandemic. Nurses' knowledge and attitudes can directly influence their practices. Effective nurses' practices lead to achievement of the desired outcomes. The study **aimed** to: assess Nurse's Knowledge and attitude regarding WHO breastfeeding guideline during COVID-١٩. **Subject & Method:** A descriptive research design was used to accomplish this study. **Sample:** Study sample included one hundred and ten nurses who were working in obstetrics and gynecology departments and neonatal intensive care unit at Mansoura University Hospitals were involved in the study. **Tools:** Data was collected through three tools. **Tool I:** Socio- demographic data about nurses. **Tool II:** Nurse's Knowledge regarding

WHO breastfeeding guideline during COVID-١٩. It included ٢ parts: **Part I:** General knowledge about covid ١٩; **Part II:** knowledge regarding WHO breastfeeding guideline during COVID-١٩. **Tool III:** Attitude of the nurses towards breast feeding during COVID-١٩. **Results:** A total of ٧١ (٦٤,٥%) of nurses showed poor level of knowledge regarding World Health Organization breastfeeding guideline during COVID-١٩, while ١٢ (١٠,٩%) of nurses had good level of knowledge. Moreover, ٦٥,٥% of nurses had a positive attitude toward breast feeding during COVID-١٩. **Conclusion:** The study provided a better understanding of prevalent knowledge of nurses regarding the recommended breastfeeding practices among suspected or confirmed cases with COVID-١٩. The results highlighted that there were poor knowledge score regarding WHO breastfeeding guideline during COVID-١٩ and a positive attitude toward breast feeding during covid. The study **recommended;** Promotion of optimal breastfeeding practices during the COVID-١٩ pandemic and creating awareness among nurses and HCWs about WHO breastfeeding guideline during COVID-١٩. **Further researches;** are needed to provide educational program to nurses about World Health Organization breastfeeding guidelines during COVID-١٩.

Key words: Attitude ,Breastfeeding, COVID-١٩, Knowledge, Nurse's, WHO guideline.

Introduction

Corona virus is a single-stranded RNA virus of the beta-coronavirus genus. Virus transmission among people is predominantly by respiratory droplets and direct contact with no conclusive evidence of vertical transmission. In recent researches, there has no evidence about transmission of the SARS-CoV-٢ through breast milk. COVID-١٩ pandemic has been one of the most

disruptions in the routine provision of perinatal health and healthcare workers (HCWs) remains hesitated regarding advice to be given to lactating mothers who are suspected or confirmed with COVID-١٩^(١).

Exclusive breastfeeding is defined as breast feeding during the first ٦ months of infant life without introducing other substances, is recommended by the WHO. Academy of Breastfeeding Medicine and Royal College of Obstetricians and Gynecologists recommended that exclusive breastfeeding with following the standard respiratory and hand hygiene protocols in suspected/confirmed COVID-١٩ mothers. During this crucial period, there have been

discrepancies in the initially available literature about the recommendation of short-term separation of COVID-١٩ positive mothers from their infant following childbirth, direct breastfeeding, and use of expressed breast milk ^(٢).

Breastfeeding maintains the health and wellbeing of the mother and newborn, with a dynamic, bidirectional exchange between the mother and her infant, which considers the corner stone of infant and child health. Many international organizations as WHO, United Nations International Children's Emergency Fund (UNICEF) and the Union of European Neonatal & Perinatal Societies (UENPS), all highlight the well-established short- and long-term immunological and psychosomatic benefits of breastfeeding for the both mothers and infants^(٤). Also, the current recommendations concluded that unclear evidence regarding the transmission of COVID-١٩ from mothers to their infants through breastfeeding. As a result, strict measures of mother-infant separation and discontinuation of breastfeeding should be avoided, regardless of a positive diagnosis and the intensity of symptoms. When the mother unable to provide care of their infants, in this condition, expressed, fresh,

unpasteurized breast milk could be provided to the baby^(٥).

According to WHO recommendations, the mother should be encouraged to breastfeed her infant, while considering the standard precautionary measures. It is very important for the health care team to provide all the support and guidance necessary for the breastfeeding mothers during this particularly difficult time. The presence of a healthy companion is allowed, but must not of visitors; this tends to be a cause of sorrow for WHO recommends the use of expressed breast milk during the temporary separation of the neonate, which has to be provided by a healthy caregivers to the infant. Expressing milk should be done through using a dedicated breast pump and with complete hygienic precautions. Those recommendations are aimed to provide at least the partial benefits of breast milk rather than no breast feeding ^(٦).

Nurses can play a vital role in dispelling the doubts and misconceptions among pregnant and lactating mothers regarding breast feeding. Moreover assisting mothers to receive necessary support which enable them to maintain optimal breastfeeding and managing common breastfeeding difficulties

including necessary precautions for infection prevention and control (IPC) measures ^(٧).

Significance of the study

Professional advice provided to lactating mothers in healthcare facilities impacts all aspects of infant feeding. However, studies conducted to assess the knowledge, attitude, and practice of breastfeeding among healthcare providers was inadequate during the current worldwide pandemic. The main reasons for such an existing gap in knowledge and skills are in-adequate coverage of breastfeeding and weaning in medical curricula as well as defective in-service updates. Alteration and changes that has been made in the health care system and policy, mobility of nursing staff to different departments, decrease number of staff per shift, all these factors along with the precautionary measures affect counseling and education provided to mothers during Covid-١٩ pandemic. Furthermore, mothers have numerous myths and misconceptions about breastfeeding to infants with COVID-١٩ positive mothers. Also, mothers should follow the standard precautions during breastfeeding to minimize the risk of COVID-١٩ infection ^(٨). Assessment of HCPs knowledge, attitude regarding WHO breast feeding

recommendations during COVID-١٩ is very important because this affect their practices, so the current study was established.

Aim of the study

This study aimed to assess Nurse's Knowledge and attitude regarding WHO breastfeeding guideline during COVID-١٩.

Research question

What are the Nurse's Knowledge and attitude regarding WHO breastfeeding guideline during COVID-١٩?

Subjects and Methods

Research design

A descriptive research design was used to accomplish this study.

Setting

The study was carried out at Obstetrics and gynecology wards and neonatal intensive care unit at Mansoura University Hospitals. Mansoura University Hospitals affiliated to the Ministry of Higher Education and provide care to the surrounding village. The Hospitals included four internal departments of obstetrics and gynecology and a separate ward for emergency and delivery cases next to neonatal intensive care unit. The internal departments located in the third floor and include department (٩, ١٠, ١٥, and ١٨). Every department contains from ٢٦ to ٣٠ beds and

receives high risk pregnancy and postnatal cases after cesarean deliveries. Emergency and delivery ward located in the ground and receive cases in the hot days (Sunday, Tuesday, and Thursday). Cases admitted to the Emergency and delivery unit for normal delivery or emergency obstetric care. Neonatal intensive care unit located in the ground next to emergency and delivery unit. This unit includes 10 incubators and receives emergency newborn cases from delivery unit. Care provided by 19 nurses and 0 physicians.

Study subjects

A convenient sample of One hundred and ten nurses who were providing care in obstetrics and gynecology departments, nurses in the emergency and delivery ward as well as nurses in neonatal intensive care unit at Mansoura University Hospitals

Sample Size Calculation

Based on data from literature (Rajan et al., 2020)⁽⁹⁾, to determine the sample size with precision/absolute error of 5% and type 1 error of 5%:

$$\text{Sample size} = [(Z_{1-\alpha/2})^2 \cdot P(1-P)]/d^2$$

Where,

$Z_{1-\alpha/2}$ = is the standard normal variate, at 5% type 1 error ($p < 0.05$) it is 1.96.

P = the expected proportion in population depended on previous studies.

d = absolute error or precision.

So, Sample size = $[(1.96)^2 \cdot (0.741) \cdot (1 - 0.741)] / (0.05)^2 = 109.6$. Based on the previous formula, the sample size required for the current study is 110.

Tools of Data Collection

Data collection included the following three tools:

Tool I: Structured Interview

Questionnaire: This tool was developed by the researcher based on relevant literature to assess the basic data of the study subjects and included:

Part I: Socio- demographic data of nurses:

This part included the socio-demographic characteristics of nurses: such as (age, educational level, residence, and marital status.

Part II: Professional characteristics of nurses:

This part included (working department, years of experiences and previous training about breast feeding during covid -19).

Tool II: Nurse's Knowledge regarding WHO breastfeeding guideline during COVID-19.

It included 7 parts as follows:

Part I: General knowledge about covid 19:

It developed by the researcher after revising the other related literatures (Mohamed,

2021) (11) and contained 9 items related to covid-19 such as (causative agent, source of infection, symptoms, mode of transmission, high risk groups, factors increase the risk of infection, does the infection has a cure, treatment, and the protective measures against COVID-19).

Scoring System

Knowledge regarding COVID-19 questionnaire is a 9-item questionnaire. The responses of the nurses were recorded as incorrect (score 0) or correct (score 1). The total scores of the 9 items were summed up into a total score, ranging from 0 to 9. The total knowledge score in categorized into 3 knowledge levels: poor knowledge (<50% of the total score), fair knowledge (50-65% of the total score) and good knowledge (>65% of the total score).

Part II: knowledge regarding WHO breastfeeding guideline during COVID-19:

It developed by (World Health Organization, 2020) (12) which consisted of 13 recommendations that should be followed by the health care providers if the mother was positive/suspected COVID-19. And also, contains 5 recommendations if the mother was negative.

Scoring System

WHO guideline about breast feeding during COVID-19 is a 10-item questionnaire, with the nurses' response for each question is either: No (score 0), not sure (score 1) and yes (score 2). The total knowledge score ranged from 0 to 20. The total score in categorized into 3 knowledge levels: poor knowledge (<50% of the total score), fair knowledge (50-65% of the total score) and good knowledge (>65% of the total score).

Tool III: Nurses' Attitude towards breast feeding during COVID-19.

It developed by the researcher after revising the related literatures (Dimopoulou et al., 2020) (13) and contained 9 items such as (COVID-19 can easily be prevented during breast feeding, COVID-19 will finally be successfully controlled during breast feeding, there is no evidence that COVID-19 transmitted to fetus from mother during breast feeding, ect...). A three-point Likert scale (Disagree, Uncertain, Agree) was used to assess the adequacy of attitude among the respondents.

Scoring System

This questionnaire is formed of 9 items. The response of the nurses for each item was either disagree (score 1), uncertain (score 2) and agree (score 3). The scores of the individual items were summed up into a total

score that ranged from ٩ to ٢٧. The total attitude score is categorized as either negative ($< ٦٠\%$ of the total score) or positive ($\geq ٦٠\%$ of total score).

Validity and reliability

Content validity of the study tools ascertained by jury of ٥ professors in the field of pediatric and maternity nursing and the looked-for modifications were carried out. Some questions were omitted, and others rephrased in general knowledge part and in the attitude scale. Reliability was done by Cronbach's alpha coefficient test; the results were (٠,٨٧٢ & ٠,٨٩٤) for knowledge and attitude tools respectively.

Pilot Study

It was conducted on ١٠% of nurses (١١ nurses). The aim of the pilot study was to evaluate clarity, visibility, applicability, as well as the time required to fulfill the developed tools. Subjects who shared in the pilot study were excluded from the main study subjects.

Ethical considerations

The researcher explained the aim of the research to nursing managers to get better cooperation during the data collection of the research. Also, an informed consent was obtained from each participant. Informed

consent was obtained including their rights to refuse participation or withdraw at any time, without giving any reason. The participants were assured that all obtained information will be treated confidentially; and will only be used for the purpose of research. They were also informed that the research maneuvers not entail any harmful effects to them.

Fieldwork

The study consumed ٣ months began from March ٢٠٢١ till May ٢٠٢١, through ٣ phases as following:

Preparatory phase

- The researchers review the relevant literature related to prepare the tools for the study.
- An official written approval letter clarifying the title, purpose and setting of the study was obtained from the director of the obstetrics and gynecology wards and neonatal intensive care unit at Mansoura University Hospitals
- The researchers interviewed each nurse individually and explained the aim of the study also obtain the informed consent before data collection process.

Implementation phase

- The researchers went to the predetermined settings three days per week (Sunday, Tuesday, and Thursday).
- Data collection process started first with the emergency and delivery ward. In this

wards every parturient woman stay from ٦-٨ hours after normal delivery to be under close observation by health care providers.

- After the nurses complete their role either labor and delivery care or post-partum care, the researchers started to collect the data.
- Data was obtained individually from each nurse in whom the researchers collect the socio demographic data from the nurses.
- Then, nurses' general knowledge about COVID-١٩ and knowledge about WHO breast feeding guideline was obtained.
- Furthermore, nurses' attitude regarding breastfeeding during COVID-١٩ was assessed.
- After completion the data collection from the emergency and delivery ward, the researchers continued the data collection from obstetrics and gynecology wards (٩, ١٠, ١٥, and ١٨). In these wards the nurses provide the preoperative care to cesarean delivery cases in which the cases were admitted ٤٨ hours before the operation. Also, post-operative care was provided as the woman stay from ٢٤ to ٤٨ hours after delivery for normal conditions. If there is any complication, the period of hospital stay was increased.

- After completion the data collection from obstetrics and gynecology wards , the researchers continued the data collection from neonatal intensive care unit.
- During the resting time of the nurses, the researchers interviewed every nurse and collect the necessary data as the same previous manner.
- The study researchers spent about ٢٠ to ٣٥ minutes with every nurse to obtain the necessary information.
- The researchers followed the recommended protective measures of COVID-١٩ during data collection process.
- The researchers went to the previous mentioned settings until the data collection process was completed.

Statistical data analysis

Statistical analysis was conducted using SPSS for windows version ٢٠,٠ (SPSS, Chicago, IL). All variables with continuous data showed normal distribution and were expressed in mean \pm standard deviation (SD). Categorical data were presented in number and percentage. Data comparisons were expressed using chi-square test for variables with categorical data. The reliability (internal consistency) of the nurse's knowledge regarding COVID-١٩, nurses regarding WHO breastfeeding guideline during COVID-١٩ and Nurses' attitude

regarding breast feeding during COVID 19 questionnaires was calculated. Statistical significance was maintained at $p < 0.05$.

Results

Table (1) presents socio-demographic characteristics of nurses; it revealed that the age of more than one third of nurses (38,2%) were less than 20 years with mean age $27,3 \pm 4,1$. Regarding their education, 41,0% of nurses graduated from Secondary Nursing School. Concerning to their level of experience, it was observed that 30,0% had from 6 to 10 years of experience. Unfortunately, 93,6% of nurses didn't attend any training program related to breast feeding.

Table (2) presents that majority of studied nurses 90 (86,3%) know the sources of infection; about more than three quarter of them know risk groups, treatment, risk factors, mode of transmission of COVID-19.

Figure (1): Shows total general knowledge of nurse's regarding COVID-19; they illustrated that a total of 73 (66,4%) of nurses showed good level of knowledge regarding COVID-19 while 17 (15,4%) of nurses had poor level of knowledge.

Table (3) & figure (2): Reveals total knowledge of nurses regarding World

Health Organization breastfeeding guideline during COVID-19; they revealed that A total of 71 (64,0%) of nurses showed poor level of knowledge regarding World Health Organization breastfeeding guidelines during COVID-19 while 12 (10,9%) of nurses had good level of knowledge

Table 4 & figure 3 demonstrate that total nurse's attitude regarding breast feeding during COVID 19; it revealed that near two third of nurses (60, 0%) showed a positive attitude regarding COVID 19 while only 34, 0% had a negative attitude.

Table (5) :represents association between Total Knowledge score regarding World Health Organization breastfeeding guideline during COVID-19 and attitude regarding breastfeeding during COVID 19;it reveals that, 83,3% of nurses with a good knowledge regarding WHO breastfeeding guidelines during COVID-19, had appositve attitude with statistically significant difference ($p < 0.001$).

Table (6): reveals association between the socio-demographic characteristics of nurses and knowledge regarding World Health Organization breastfeeding guidelines during COVID-19; it shows, that (66,7%) of nurses who had Bachelor Degree had a good level of knowledge regarding

World Health Organization breastfeeding guidelines during COVID-١٩. On the other hand, it was observed that (٥٨%) of nurses who had more than ١٦ years of experience had a good level of knowledge regarding

World Health Organization breastfeeding guidelines during COVID-١٩, with statistically significant difference ($p < ٠,٠٠١$).

Table (I): Socio- demographic characteristics of the studied nurses. (N= ١١٠)

	N	%
Age (years)		
<٢٥	٤٢	٣٨,٢
٢٥ – ٣٠	٣٦	٣٢,٧
٣١ – ٣٥	٢٣	٢٠,٩
>٣٥	٩	٨,٢
Mean ±SD	٢٧,٣ ±٤,١	
Marital status		
Married	٧٣	٦٦,٤
Unmarried	٣٧	٣٣,٦
Educational qualification		
Secondary Nursing School	٤٤	٤٠,٠
Technical Institution of Nursing	٣٩	٣٥,٥
Bachelor Degree	٢٧	٢٤,٥
Residence		
Urban	٨٦	٧٨,٢
Rural	٢٤	٢١,٨
Years of Experience		
<٦	٣٤	٣٠,٩
٦ – ١٠	٣٩	٣٥,٥
١١ – ١٦	٢٧	٢٤,٥
>١٦	١٠	٩,١
Mean ±SD	٧,٢ ±٣,١	
Working department		
Labor & Delivery ward	١٩	١٧,٣
Department (٩)	١٧	١٥,٤
Department (١٠)	١٨	١٦,٣
Department (١٥)	١٩	١٧,٣
Department (١٨)	٢٣	٢٠,٩
Neonatal intensive care unit	١٤	١٢,٧
Attending any Training Program Related to Breast feeding		
No	١٠٣	٩٣,٦
Yes	٧	٦,٤

Table ٢. Nurse's general knowledge regarding COVID-١٩. (N= ١١٠)

Variables	Correct answer	
	N	%
• Agents of COVID-١٩	٩٠	٨١,٩
• Sources of infection	٩٥	٨٦,٣
• Symptoms of COVID-١٩	٩٣	٨٤,٥
• Does COVID-١٩ have a cure?	٧٩	٧١,٨
• Treatment of COVID-١٩		
Antibiotics	٧٤	٦٧,٣
Drink hot water	٨١	٧٣,٦
Drink salt water	٧٤	٦٧,٢
• Mode of transmission		
flying spit from patient while coughing or sneezing	٨٦	٧٨,١
Touching contaminated surfaces and tools and then touching the mouth, nose, or eye	٨٧	٧٩
• Factors increase risk for COVID ١٩ infection		
Sharing food and drink utensils	٨١	٧٣,٦
Eat foods without cooking, especially meat and eggs	٨١	٧٣,٦
Crowded places like the train and transportation	٩٣	٨٤,٥
• Risk group for COVID ١٩		
Chronic illness	٨٢	٧٤,٥
Immuno compromised	٨٩	٨٠,٩
Pregnant mothers	٨٥	٧٧,٢
People aged ٦٥ years and older	٧٦	٦٩
• Protective measures against COVID ١٩		
Regular hand washing with an alcohol-based hand rub or soap and water	٨٣	٧٥,٥
Maintain at least ١ meter distance between yourself and others	٨٨	٨٠
Avoid going to crowded places	٨٨	٨٠
Avoid touching eyes, nose and mouth	٧٨	٧٠,٩
Wear a mask to avoid infecting others	٨٧	٧٩
Seek medical attention	٩١	٨٢

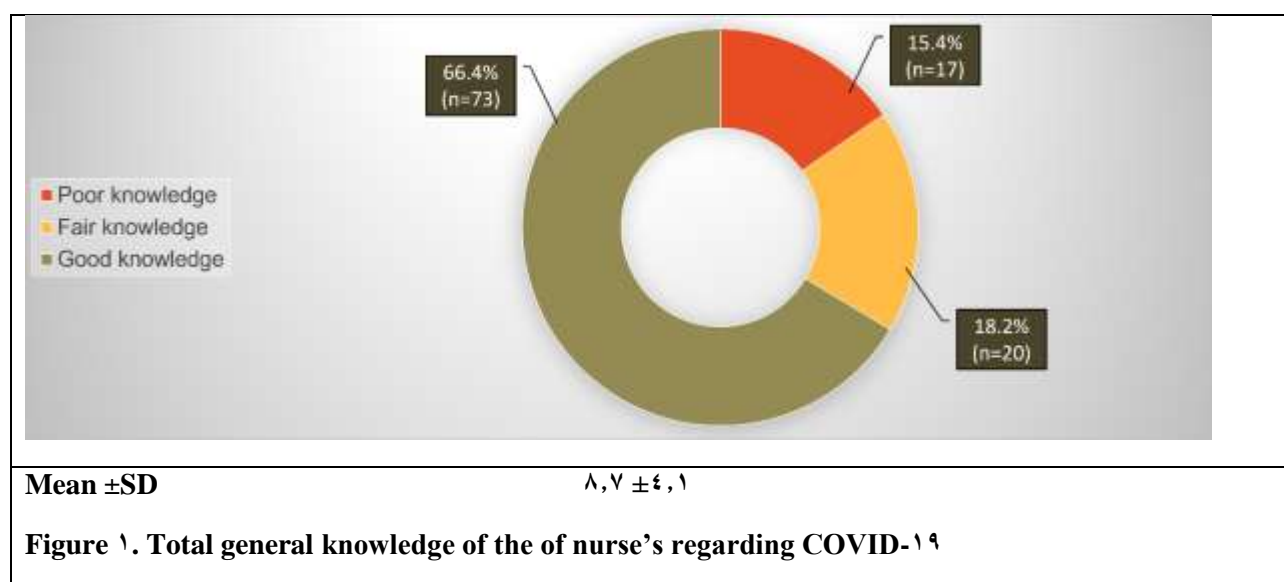


Table ٣. Nurses' knowledge regarding WHO breast feeding guideline during COVID-١٩. (N= ١١٠)

WHO Recommendations if positive/suspected COVID-١٩	No		Not Sure		Yes	
Recommendations if positive/suspected	n	%	N	%	N	%
١. The COVID-١٩ virus has not, to date, been detected in the breastmilk of any mother with confirmed / suspected COVID-١٩.	٦٥	٥٩,١	٣٣	٣٠,٠	١٢	١٠,٩
٢. Skin to skin contact and breastfeeding immediately after birth is recommended	٦٨	٦١,٨	٣٥	٣١,٨	٧	٦,٤
٣. The continuation of breastfeeding is recommended if the mother tests positive for COVID-١٩	٦٩	٦٢,٧	٣٣	٣٠,٠	٨	٧,٣
٤. Hygiene practices when positive for COVID-١٩ and breastfeeding	٧٤	٦٧,٣	٣٠	٢٧,٣	٦	٥,٥
٥. Hand washing should be done before touching an infant	٩	٨,٢	٢٠	١٨,٢	٨١	٧٣,٦
٦. In the event that you cough or sneeze, do so into a tissue and immediately wash hands with soap and water or an alcohol-based hand rub	٧٩	٧١,٨	٢١	١٩,١	١٠	٩,١
٧. Surfaces should be regularly cleaned and disinfected	٧٣	٦٦,٤	٢٠	١٨,٢	١٧	١٥,٥
٨. A breastfeeding mother with confirmed/suspected COVID-١٩ without access to a medical mask should still breastfeed, while also maintaining other hygiene precautions	٧٤	٦٧,٣	٢٤	٢١,٨	١٢	١٠,٩
٩. If a mother confirmed/suspected to have COVID-١٩ has just coughed over her exposed breast or chest, then she should gently wash the breast with soap and warm water for at least ٢٠ seconds prior to feeding” however, it is not necessary to wash the breast before every infant feeding.	٧٢	٦٥,٥	٢٧	٢٤,٥	١١	١٠,٠
١٠. If a mother with suspected or confirmed COVID-١٩ is unable to breastfeed, expressed breastmilk is the best alternative method of infant feeding and is primarily done with hand expression or with the use of a mechanical pump	٧٢	٦٥,٥	٢٣	٢٠,٩	١٥	١٣,٦
١١. A mother who was unable to breastfeed due to illness caused by COVID-١٩ and has recovered may begin breastfeeding as soon as she feels well enough	٦٧	٦٠,٩	٢٥	٢٢,٧	١٨	١٦,٤
١٢. Newborns and infants are considered to be at low risk of COVID-١٩ infection, and of the cases of COVID-١٩ in young children, most experienced mild symptoms or were asymptomatic	٦٢	٥٦,٤	٢٨	٢٥,٥	٢٠	١٨,٢
١٣. For women with confirmed or suspected COVID-١٩, infant formula is not safer than breastmilk, and actually has more associated risks	٧٥	٦٨,٢	٢٧	٢٤,٥	٨	٧,٣
WHO Recommendations if negative COVID-١٩						
١٤. In cases where COVID-١٩ is present in a mother's community, breastfeeding is still recommended, as it is what is healthiest for the infant and there is no evidence that COVID-١٩ can be transmitted through breast milk	٦٥	٥٩,١	٣٢	٢٩,١	١٣	١١,٨
١٥. Despite a lack of risk of having COVID-١٩, if a mother is using a breast pump or milk storage containers, the equipment should be cleaned after each use with soap and water or in the dishwasher if possible.	٦٦	٦٠,٠	٣٢	٢٩,١	١٢	١٠,٩

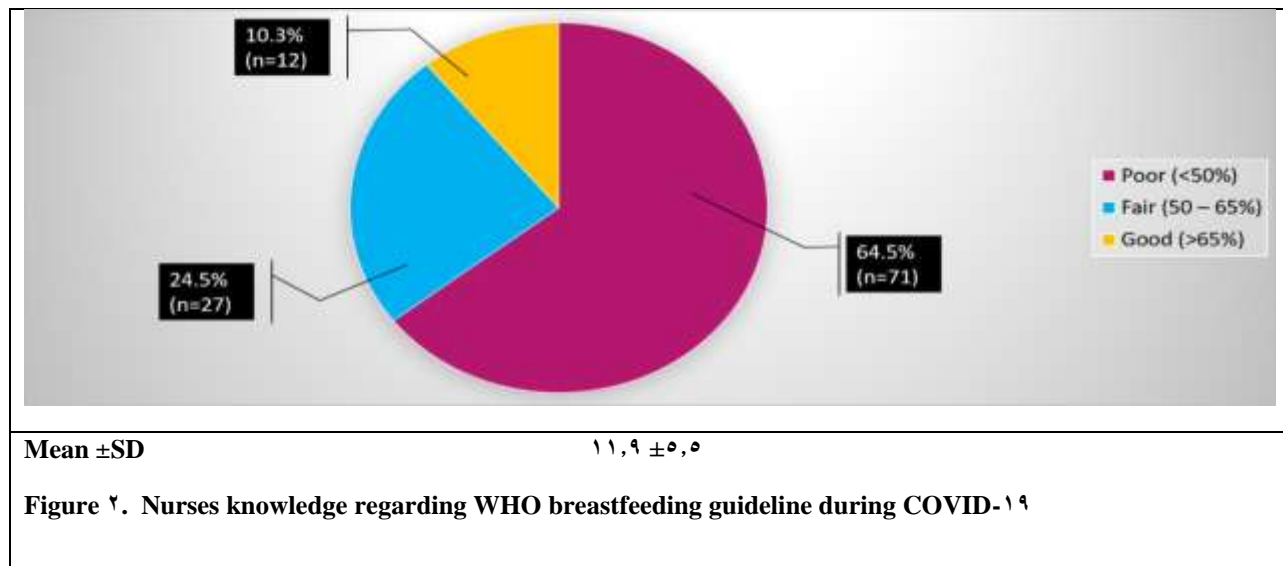


Table 4. Nurses' attitude regarding breast feeding during COVID-19. (N= 110)

Variables	Disagree		Uncertain		Agree	
	N	%	N	%	N	%
1. Breast feeding can be affected during COVID-19 pandemic.	31	28,2	43	39,1	36	32,7
2. COVID-19 virus can be passed through breast milk to the baby	33	30,0	40	36,4	37	33,6
3. Baby might get infected from his /her mother during breast feeding.	33	30,0	40	36,4	37	33,6
4. There is no evidence that COVID-19 transmitted to fetus from mother	34	30,9	41	37,3	35	31,8
5. Women with confirmed or suspected COVID-19 can breastfeed her baby, while following protective measures during breast feeding.	30	27,3	41	37,3	39	35,4
6. Period of breast feeding can be affected during COVID-19.	31	28,2	47	42,7	32	29,1
7. Position of breastfeeding can be modified with COVID-19 confirmed or suspected cases.	52	47,3	33	30,0	25	22,7
8. Temporary separation of the mother and her infant after breast feeding can minimize risk of infection.	29	26,4	49	44,5	32	29,1
9. Expressed milk can be safe to baby of confirmed/ suspected mothers.	28	25,5	49	44,5	33	30,0

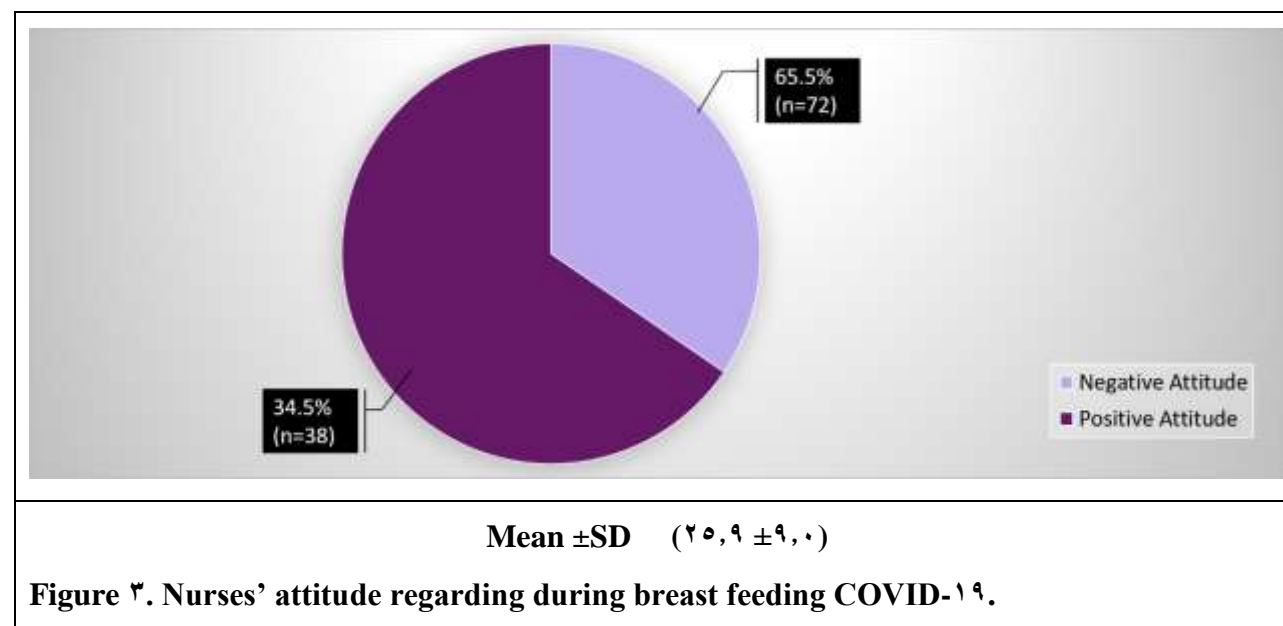


Table ٥. Association between Total Nurses' Knowledge scores regarding WHO breastfeeding guideline during COVID-١٩ and Nurses' attitude regarding COVID-١٩

	Total Knowledge regarding World Health Organization breastfeeding guideline during COVID-١٩						
	Poor (n=٧١)		Fair (n=٢٧)		Good (n=١٢)		Chi-Square X ^٢ P
	N	%	N	%	N	%	
Attitude							
Negative	٦٣	٨٨,٧	٧	٢٥,٠	٢	١٦,٧	٤٨,٣٠٤ <٠,٠٠١
Positive	٨	١١,٣	٢٠	٧٤,١	١٠	٨٣,٣	

Table ٦. Association between nurses' socio-demographic characteristics and nurses' knowledge regarding WHO breastfeeding guideline during COVID-١٩.

nurses' socio-demographic characteristics	Poor(n=٧١)		Fair(n=٢٧)		Good(n=١٢)		Chi-Square X ^٢ P	
	n	%	n	%	n	%		
Age (years)								
<٢٥	٣٠	٤٢,٣	١٠	٣٧,٠	٣	٢٥,٠		
٢٥ – ٣٠	٢٧	٣٨,٠	٧	٢٥,٩	٢	١٦,٧		
٣١ – ٣٥	١٢	١٦,٩	٨	٢٩,٦	٣	٢٥,٠		
>٣٥	٣	٤,٢	٢	٧,٤	٤	٣٣,٣	١٥,١٣١	٠,٠١٩
Marital status								
Married	٤٦	٦٤,٨	٢٠	٧٤,١	٧	٥٨,٣		
Unmarried	٢٥	٣٥,٢	٧	٢٥,٩	٥	٤١,٧	١,١٤٥	٠,٠٦٤
Educational qualification								
Secondary Nursing School	٣٢	٤٥,١	١٠	٣٧,٠	٢	١٦,٧		
Technical Institution of Nursing	٢٦	٣٦,٦	١١	٤٠,٧	٢	١٦,٧		
Bachelor Degree	١٣	١٨,٣	٦	٢٢,٢	٨	٦٦,٧	١٣,٤٤٢	٠,٠٠٩
Years of Experience								
<٦	٣٠	٤٢,٣	٤	١٤,٨	٠	٠,٠		
٦ – ١٠	٢٧	٣٨,٠	١٢	٤٤,٤	٠	٠,٠		
١١ – ١٦	١٤	١٩,٧	٨	٢٩,٦	٥	٤١,٧		
>١٦	٠	٠,٠	٣	١١,١	٧	٥٨,٣	٥٤,٩٠٥	<٠,٠٠١
Residence								
Urban	٤٨	٦٧,٦	٢٦	٩٦,٣	١٢	١٠٠,٠		
Rural	٢٣	٣٢,٤	١	٣,٧	٠	٠,٠	١٣,١٩٨	<٠,٠٠١
Attending any Training Program Related to Breast feeding								
No	٧١	١٠٠,٠	٢٠	٧٤,١	١٢	١٠٠,٠		
Yes	٠	٠,٠	٧	٢٥,٩	٠	٠,٠	٢٢,٩٨١	<٠,٠٠١

Discussion

In the COVID-19 pandemic scenario, social distancing is the “new normal” for preventing the transmission of SARS-COV-2 virus. This leads to a lot of confusion as to whether to let mother and baby dyad bond in close contact and breastfeed or not if the mother is COVID-19 suspected/confirmed. The recommendations of social distance among the general population aim to decrease the prevalence of COVID-19 because it reduces morbidity and mortality, better lifelong survival, health, and growth of the newborn/infant (12). This study is the first of its kind in Egypt exploring breast feed mothers’ knowledge and attitudes regarding WHO breastfeeding guideline during COVID-19. Therefore, a great want to offer baseline statistics for enforcing tasks to perceive the educational needs and alter recurring practices in the fight against this pandemic.

In the present study about two thirds of nurses showed good level of the general knowledge regarding COVID-19 while (10,4%) of nurses had poor level of knowledge. This comes in accordance with (Mohamed., 2021)(11). He found that more than three quarter and majority of the participants (nurses, and physicians) had good knowledge towards COR-ONA virus. From the researcher point

of view this may be due to continuous provision of information and instruction on mass media, continuous training program and encourage healthcare providers to be aware of COVID-19 updates.

On the other hand this isn't in agreement with a study in the United Arab Emirates which is done by (Bhagavathula AS, Wafa Ali Aldhaleei WA, Rahmani J, 2020) (13). They clarify that there were in sufficient level of knowledge about the disease transmission, and a significant proportion of the symptom was found among health care workers.

Concerning nurses’ knowledge regarding WHO breastfeeding guideline during COVID-19. The nurses in the present study demonstrated that less than one third of the infants are considered to be at lower risk of COVID-19 infection, and the cases of COVID-19 among young children always presented with mild symptoms or were asymptomatic. This may be explained by the fact that age-related increase in endothelial damage and changes in clotting function, pre-existing coronavirus antibodies and T cells, a higher prevalence of comorbidities associated with severe COVID-19 in adult persons than younger children. These results supported by the Centers of Disease Control and Prevention (CDC, 2021)(14) which

highlighted that Coronavirus disease is an illness presented with severe acute respiratory syndrome that is more symptomatic and dangerous in adult individuals than younger. In the United States and throughout the world, children were less suffering of COVID-١٩ than adults. Whereas children of the US population were less than one quarter, minority of all cases of COVID-١٩ reported to the Centers for Disease Control and Prevention (CDC) were among children and their cases are mild and respond well to the supportive care.

The current results clarified that about three quarter of nurses supported that hand washing should be done before touching an infant. These results congruent with **(Pereira et al., ٢٠٢٠)^(١٥)** They found that breast feeding is safe during COVID-١٩ with the proper precautions. Also, they recommend that mothers with young children should have the best practice of protection to reduce their risk of infection. These practices include frequent hand hygiene, frequent disinfection of surfaces and objects, and covering their mouth if they cough or sneeze. The explanation for that is the great influence of mass media about the protection of COVID and Lately, on the ٣٠th of May, the Egyptian Government has mandated wearing a face

mask in public places and at public transportation.

About one third of nurses supported that when the mother is suspected or confirmed with COVID-١٩ is unable to breastfeed, expressed breast milk is the best alternative method of infant feeding. Those findings are congruent with **(Breastfeeding Promotion Network of India, ٢٠٢٠)^(١٦)** that has advised; when the mother is unwell and not able to breastfeed directly, she will be able to express her breast milk, which should be given to the infant with a clean cup and/or spoon with the aid of using a healthful caregiver. In a situation when the mother is unable to breastfeed or express breast milk (on ventilator/ICU), as WHO advises, moist nursing, donor human milk, relaxation, or suitable breast milk substitutes ought to be used. This may be due to increasing awareness of nurses regarding the importance of breast milk which is a complete, wholesome, safe, affordable, easily available, immunity providing, and culturally acceptable nutrition

The current study finding showed that about one third of nurses showed poor level of knowledge regarding WHO breastfeeding guideline during COVID-١٩ while minority of them had good level of knowledge. Those

results not in the same line with the result of **(Rajan et al., 2020)**⁽⁴⁾, they showed that more than two third of female ward assistant while, more than one third of nursing assistant and more than one half of nursing officer had good knowledge and awareness level regarding optimal breastfeeding practices in suspected/confirmed COVID-19 mothers as per the guidance provided by the WHO. This can be because of loss of educated health care specialists who offer breastfeeding counseling, basic psychosocial support, and practical feeding support. Another reason for that can be because of the stigma related to COVID-19 infection with inside the health care worker whom afraid of getting infected is their worry to transmit the contamination to their households observed via way of means of their belief that the condition is highly transmissible. Also, the reluctance of the general public who are looking for hospital treatment and underreporting of cases, which may also the reason of the fast unfold of the sickness.

The current study observed that near two third of nurses showed positive attitude regarding breast feeding during COVID 19 while one third had a negative attitude.. Those results were in accordance with **(Olum, R.; Chekwech, G.; Wekha, G.; Nassozi, D.R.;**

Bongomin, F 2020)⁽¹¹⁾. They stated that more than three quarter of their study participants had a positive attitude towards COVID-19. Which is much higher than the 21% previously reported in among HCWs in Uganda. It is due to positive attitudes from nurse regarding breast feeding during COVID is a very important prerequisite for prevention beliefs, and for promotion of positive practices

Concerning association between total knowledge score regarding World Health Organization breastfeeding guideline during COVID-19 and attitude regarding breastfeeding during COVID 19; the present study revealed that, most of nurses with a good knowledge regarding World Health Organization breastfeeding guidelines during COVID-19 had appositve attitude regarding breastfeeding during COVID 19 , from the researcher point of view this may be due to the fact that knowledge of health care workers (HCWs) is vital for maintaining positive attitude and correct misconception. It also affects their coping strategies to some extent. A Cross-Sectional Study conducted in Egypt by **Abdel Wahed W , Hefzy E, Ahmed M and Hamed N (2020)**⁽¹²⁾, whom have a similar results as good knowledge regarding COVID-19 was significantly

associated with the positive attitude of the studied group.

Regarding relation between the socio-demographic characteristics of nurses and knowledge regarding World Health Organization breastfeeding guideline during COVID-١٩; the present study revealed that, less than three quarter of nurses who had Bachelor Degree had a good level of knowledge regarding World Health Organization breastfeeding guideline during COVID-١٩. From the researcher point of view this may be due to the ministry of health continuous updates its website and encourage healthcare providers to be aware of COVID-١٩ updates. This result was in the same line with **Zhong B-L (٢٠٢٠)** ^(١٩), who found that positive correlation between the level of education and knowledge regarding COVID-١٩.

Conclusion

This study provides a better understanding of prevalent knowledge of nurses regarding the advice to be given to breastfeeding mothers who are suspected/confirmed with COVID-١٩ during confinement or after delivery. The results highlighted that heir was a poor knowledge score regarding general knowledge and the negative attitudes toward covide.

Recommendations

Depend on the finding of the current study the following is recommended:-

- Training programs to maternity staff about WHO breastfeeding guidance during COVID-١٩ pandemic is very essential to increase their level of knowledge and maintain optimal breastfeeding practice.
- Well-designed brochures about the recommended breast feeding practices during COVID-١٩ should be designed and distributed among maternity nurses to increase their level of awareness.
- Continuous training of health care personnel about the standard infection prevention measures during breast feeding among infected and suspected mothers is very crucial.
- Providing nurses with emotional, financial and administrative support is crucial during the current pandemic.

References

١. The American Journal of Managed Care. A Timeline of COVID-١٩ Developments in ٢٠٢٠. AJMC. Available at: <https://www.ajmc.com/view/a-timeline-of-covid١٩-developments-in-٢٠٢٠>
٢. World Health Organization. Infant and Young Child Feeding: Fact Sheet. Geneva: World Health Organization; ٢٠٢٠.

- Available from: <https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>.
٣. Academy of Breastfeeding Medicine. ABM Statement on Coronavirus ٢٠١٩ (COVID-١٩). New York: Academy of Breastfeeding Medicine; ٢٠٢٠. Available from: <https://www.bfmed.org/abm-statementcoronavirus>. [Last accessed on ٢٠٢٠ Sep ١٥].
 ٤. Royal College of Obstetricians and Gynaecologists. Coronavirus (COVID-١٩) Infection in Pregnancy. London: Royal College of Obstetricians and Gynaecologists, Royal College of Midwives, Royal College of Paediatrics and Child Health, Public Health England and Health Protection Scotland; ٢٠٢٠. Available from: <https://www.rcog.org.uk/globalassets/documents/guidelines/٢٠٢٠-٠٦-١٨-coronavirus-covid-١٩-infection-in-pregnancy.pdf>.
 ٥. World Health Organization. Breastfeeding and COVID-١٩: Scientific Brief. Geneva: World Health Organization; ٢٠٢٠. Available from: <https://www.who.int/publications/i/item/١٠٦٦٥٣٣٢٦٣٩>
 ٦. World Health Organization, United Nations Children's Fund. Global strategy for infant and young child feeding. Geneva: World Health Organization; ٢٠٠٣. Available from: <https://www.who.int/nutrition/publications/infantfeeding/٩٢٤١٥٦٢٢١٨/en>
 ٧. Male M RM, Marshall J, Mphil H. Turning policy into practice: more difficult than it seems. The case of breastfeeding education. *Matern Child Nutr.* ٢٠٠٦; ٢(٢): ١٠٣-١٣.
 ٨. Latorre, G., Martinelli, D., Guida, P. & et al. Impact of COVID-١٩ pandemic lockdown on exclusive breastfeeding in non-infected mothers. *Int Breastfeed J* , ٢٠٢١; ١٦, ٣٦. <https://doi.org/١٠.١١٨٦/s١٣٠٠٦-٠٢١-٠٣٨٢-٤>
 ٩. Rajan, A. R., Vishal, A. K., & Bhawe, A. A.. Assessment of knowledge of healthcare workers in a service hospital regarding breastfeeding practices in mothers confirmed or suspected to have COVID-١٩. *Indian Journal of Child Health*, ٢٠٢٠; ٧(١١), ٤٣٧-٤٤٠.
 ١٠. Mohammed, Knowledge, Attitudes, and Practices towards COVID-١٩ among Health Care Workers in Primary Health Care Units Dar El Salam, Sohag, Egypt. *SOHAG MEDICAL JOURNAL*, Vol. ٢٥ No. ١ Jan ٢٠٢١

11. Dimopoulou, D., Triantafyllidou, P., Daskalaki, A., Syridou, G., & Papaevangelou, V. Breastfeeding during the novel coronavirus (COVID-19) pandemic: guidelines and challenges. The Journal of Maternal-Fetal & Neonatal Medicine, 2020; 1-7
12. Houry A, Mitra A, Carothers C, Foretich C. Improving breastfeeding knowledge, attitude, and practice of WIC clinic staff. Public Health Rep. 2002; 117: 453-62.
13. Bhagavathula AS, Wafa Ali Aldhaleei WA, Rahmani J, Knowledge and Perceptions of COVID-19 Among Health Care Workers, JMIR Public Health Surveil, 2020 Apr 20; 6(2): e19116. doi: 10.2196/19116.
14. CDC. Demographic Trends of COVID-19 cases and deaths in the US reported to CDC. center for disease and control prevention available at <https://covid.cdc.gov/covid-data-tracker/#demographics>. June 2021.
15. Pereira A, Cruz-Melguizo S, Adrien M, Fuentes L, Marin E, Forti A, et al. Breastfeeding mothers with COVID-19 infection: A case series. Int Breastfeed J 2020; 15: 1-8
16. Breastfeeding Promotion Network of India. COVID-19 and Breastfeeding Information Update. Mumbai: Breastfeeding Promotion Network of India; 2020. Available from: <https://www.bpni.org/wp-content/uploads/2020/09/Update-on-COVID-19-and-Breastfeeding.pdf>.
17. Olum, R.; Chekwech, G.; Wekha, G.; Nassozi, D.R.; Bongomin, F. Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda. Front. Public Health 2020, 8, 181
18. Abdel Wahed W , Hefzy E, Ahmed M and Hamed N. Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Cross-Sectional Study from Egypt. J Community Health. 2020; 45(1) -10.
19. Zhong B-L, Luo W, Li H-M, Zhang Q-Q, Liu X-G, Li W-T, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International Journal of Biological Sciences. 2020; 16(10): 1740-52. Epub 2020/03/10.

Knowledge, attitudes and practices of food handlers about food safety at Fayoum restaurants

*Amal Yousef Abdelwahed^{١, ٢}, Shahira Mohamed Metwaly^٢, Asmaa Kamal Ahmed^٤, Zainab
Gazar Alkotb Alagamy^٥*

^١Assistant Professor of Community Health Nursing, Faculty of Nursing Damanhour University,
Egypt

^٢Assistant Professor of Public Health, College of Health Sciences, Saudi Electronic University,
Dammam, Saudi Arabia

^٢Lecturer of Community Health Nursing, Faculty of Nursing, ^٦October University. , Egypt

^٤.Assistant Professor of Nursing Administration Department, Faculty of Nursing, Fayoum
University, Egypt

^٥.Assistant Professor of Community and Geriatric Health Nursing, Faculty of Nursing Fayoum
University, Egypt

Abstract

Background: All food handlers are required to possess adequate food safety knowledge and food handling skills to handle food hygienically during preparation and to ensure that food is safe by the time it reaches the consumer especially during a corona pandemic. **The aim** of this study was to assess the level of knowledge, attitudes, and practices regarding food safety among food handlers at local and international restaurants in Fayoum. To determine the correlation between the knowledge, attitudes and practices of food handlers about food safety during the corona virus pandemic. **Study design:** a comparative quantitative cross-sectional study. **Subjects and Method:** a descriptive cross-sectional research design was conducted with a convenient sample of ١٠٠ food handlers from Fayoum. The data is collected using structured questionnaires arranged by interviews. There are four **tools:** first; Food handler's personal and socio-demographic data, second; Food handlers' knowledge Questionnaire, third; Food handlers' practices and fourth; Food handlers' attitude toward food safety scale. **Results:** More than one quarter of the food handlers had poor knowledge about food safety and less than one fifth of them had good knowledge level. The majority (٩٨,٠٪) of the food handlers had a positive attitude toward food safety and controlling food temperature. Around two thirds (٦٦,٠٪) of the food handlers had poor practice level about food safety and controlling food temperature. More than one quarter (٣٠,٠٪) of the food handlers had fair practices. **Conclusion:** Lack of knowledge and practices of food handlers are important a potential risk. Therefore, it is **recommended** that there is an urgent need to train programmers for food handlers and repeat the training at specific time intervals to ensure that the learned data is applied in daily life practice and reduce the occurrence of epidemics.

Key words: Knowledge, Attitude, Practice, Food handlers, Temperature control, Local cuisine restaurants, International restaurants.

Introduction

The corona virus pandemic has affected every country in the world, restraining people's exposure and encouraging them to stay at home more ^(١). Staying at home and limiting going to the markets has led to an increase in the demand for food delivery service from restaurants. There is currently no evidence that COVID-١٩ can be contracted through food. Restaurants should spotlight on protecting food workers, consumers and diners from human-to-human transmission ^(٢).

Food borne disease outbreaks in food preparation and service facilities are attributed to cook and storage of food at incorrect temperatures, as well as cross-contamination of food due to unsanitary handling practices ^(٣). Poor personal hygiene and the procurement of food from unreliable sources have also been found to contribute to food borne disease outbreaks in food preparation and service facilities ^(٤). Food handlers can spread the virus by coughing, speaking, breathing, sneezing, or singing. When viruses are propelled into the surrounding air, all of these actions can produce an infectious aerosol ^(٥).

In food preparation and service facilities such as restaurants, food handlers with insufficient

food safety knowledge pose a severe hazard to food safety ^(٦). As a result, all food handlers must have sufficient food safety knowledge and abilities in order to handle food hygienically throughout preparation and ensure that food is safe by the time it reaches the customer ^(٧, ٨). Food handlers must maintain high levels of food hygiene and sanitation to avoid microbial contamination of food ^(٩).

Food borne disease outbreaks can cause morbidity and mortality in the public leading to increased hospitalization cost for the public health department ^(١٠). When a food borne disease outbreak occurs, the government incurs expenses by paying health institutions to address the problem ^(١١, ١٢). Inadequate food handling procedures have been linked to low levels of food safety knowledge among food handlers ^(١٣). According to the European Food Safety Authority, food services in food premises are responsible for roughly ٤٨,٧% of food-borne illnesses in ٢٠١٩ ^(١٤). Disease Control and Prevention (CDC) estimates that there are around ٤٨ million cases of food borne illness every year, resulting in the loss of ٣٣ million healthy life years ^(١٥).

Food handlers play a major role in food contamination ⁽¹⁶⁾. In Egypt, Ministry of Health pointed out that many outbreaks food borne diseases have been occurred in last decade caused by a large proportion of people is 'eating out' ⁽¹⁷⁾. In 2021, approximately 1647 food borne illness were reported and consumption of food from commercial sources comprised about 72 per cent (10.29) of those who fell ill ⁽¹⁸⁾. In 2021 alone, the 200 incidences of food borne diseases were reported to cause illness in 2066 people ⁽¹⁹⁾.

Significance of study:

WHO reported that one out of every ten individuals falls ill by eating unsafe food each year ⁽²⁰⁾. While food safety is a shared responsibility, individual consumers and food handlers play a crucial role in preventing food borne diseases. PAHO/WHO recommends five keys to safer food: Keep everything clean, keep raw and cooked foods separate, cook fully, keep food at safe temperatures, and use safe water and raw materials ⁽²¹⁾.

In Egypt, The initiation of COVID-19 has been reported to impact people's food preparation/ eating habits, consumer food safety awareness, food and hygiene related attitude and food purchasing behavior ⁽²²⁾.

A safe and hygienic workplace helps to create a productive workforce, therefore creating a food safety and hygiene policy will ensure all employees know how to contribute to appropriate work practices ⁽²³⁾. As a result, the main purpose of this study was to (i) assess the level of knowledge, attitudes, and practices regarding food safety among food handlers at local and international restaurants in Fayoum. (ii) Determine the correlation between the knowledge, attitudes and practices of food handlers about food safety during the corona virus pandemic.

Operational definitions

Knowledge, attitude, and practice (**KAP**) surveys are the most commonly used methods in health-seeking behavior research, and they are typical of a certain community to collect information on what is **known**, **believed**, and **done** in regard to a specific topic ⁽²⁴⁾.

A food handler is anyone who works in a food industry and handles food or surfaces that are likely to come into contact with food such as cutlery and plates. A food handler may do tasks such as chopping, cooking, cooling, packing, transporting, food service, or cleaning the premises and equipment ⁽²⁵⁾.

The aim of this study was to: - assess the level of knowledge, attitudes, and practices regarding food safety among food handlers at local and international restaurants in Fayoum. To determine the correlation between the knowledge, attitudes and practices of food handlers about food safety during the corona virus pandemic

Research question

- What are the levels of food handler's knowledge, attitudes, and practices regarding food safety and temperature?
- Are there any differences between the KAP of food handlers by the types of restaurants?
- Is the Correlation between knowledge, attitude and practice levels regarding food safety temperature?
- What are the Predictors of good knowledge, attitude and practice regarding food safety temperature?

Subjects and Method

Study design: - A descriptive cross-sectional descriptive design was used in this study.

Study settings: - This study was conducted at local and international restaurants in Fayoum city. Fayoum is a governorate in Egypt in the middle of the country. Its capital is the city of Fayoum, located about 81 mi (130 km) south west of Cairo. It has a population of 3,848,708 (2020). There are

30 restaurants in Fayoum, including 6 international restaurants (American - European - seafood) and 24 local food restaurants.⁽²⁰⁾

Study subjects: - A convenience sample of (100) food handlers. The total number of food handlers in all restaurants in 2020-2021 was announced to be 200. Ten restaurants were randomly selected from the existing data (N = 30). The inclusion criteria were all restaurant food handlers working as chefs, kitchens assistants, delivery or waiters, aged 20 years or above, having access to smartphone and Whatsapp messenger, and agreeing to participate actively in the study. The exclusion criterion was a volunteer's unwillingness to continue with the research for any reason.

Study tools: Four tools used in this study. A self-administered questionnaire for this study was prepared based on previous research^(21, 22). The questionnaire was translated from English to Arabic. It was tested by four bilingual academics specializing in food safety, for its understandability. The final questionnaire consisted of 30 items. The questionnaire was composed of four sections; demographic information (2 items), Food handlers' knowledge (8 items), practices (10 items) and attitudes (10 items). The

questionnaire also included an introductory part that explained the study's purpose, the voluntarism of participants, and the time needed to complete the study

Tool (I): Sociodemographic characteristics such as, age, educational level, duration of work in the restaurant, previous training on food safety and sources of information about food safety.

Tool (II): Food handlers' knowledge regarding food temperature structured interview schedule: It included ٨ questions (yes/no format) to explore the food handlers' knowledge regarding food safety, proper temperature for storage of different food items and proper time for storage in refrigerators or freezers. The total score on the knowledge scale was calculated and converted into a percentage score classified as follows, poor practice (≥ ٥٠ % score), fair practice ($٥٠ - < ٧٥$ % score) and good practice (≤ ٧٥ % score).

Tool (III): Food handlers reported practices regarding food temperature scale:

The researchers developed it after reviewing the recent literatures. The scale comprised ١٠ questions with three responses [always = (٢), sometimes= (١) and never= (٠)].The total score on the practice scale was calculated and

converted into a percentage score classified as follows, poor practice (≥ ٥٠ % score), fair practice ($٥٠ - < ٧٥$ % score) and good practice (≤ ٧٥ % score).

Tool (IV): Food handlers' attitude toward food safety and food temperature scale: It was developed by the researchers after reviewing of recent literatures. The scale comprised ٧ statements with five-response choices from “strongly disagree” to “strongly agree” were used to ask these concerns. Questions in derogatory sentences reversed the order of the ratings. The total score was calculated and converted into percent score classified as follow, The responses were categorized into three levels, such as ≥ ٧٥ % is positive attitude, ($٥٠ - < ٧٥$ % score) is neutral attitude, and > ٥٠ % score is negative in food safety attitude.

٢- Methods:

The study was accomplished through the following steps:

Administrative process

١ – An official restaurants permission and written approval to carry out the study was obtained from the Dean of faculty of nursing to managers of restaurants before conducting this study through official letters explaining the aim of the study.

٢- Ethical considerations:

The study protocol was reviewed and approved by the Institutional Review Board of Faculty of Nursing, Fayoum University. Informed oral consents were obtained from the food handlers after brief explanation of the purpose and nature of the research. The anonymity and confidentiality of responses, voluntary participation and right to refuse to participate in the study were emphasized to food handlers. The researchers explained the objectives of the study to the participants.

٣-Tool development:

The study tools were adopted by the researcher based on literatures review modified to suit the level of understanding of all subjects and was tested for translation by experts in English language

٤- Validity of tools.

It was validated by juries of (٥) experts in the field. Their suggestions and recommendations were taken into consideration.

٥-Reliability of tools:

Cronbach Alpha Coefficient test was used to ascertain the reliability of tools after translation into Arabic language, ($r = ٠,٨٣$ for tool II, $r = ٠,٧٥$ for tool III and $٠,٨٧$ for tool IV).

٦- Pilot study

It was carried out on ١٠ food handlers who were randomly chosen from a restaurant not included in the sample in order to ascertain the relevance, clarity and applicability of the tools, test wording of the questions and estimate the time required for the interview. Based on the obtained results, the necessary modifications were done.

٧- .Data collection

Approval of responsible authorities was obtained through official letters from the Deanship of Scientific Research (DSR), El fayoum University. Meetings were held with the directors of the selected settings to clarify the purpose of the study and to gain their cooperation and support during data collection. The researchers collected data during the period from January ٢٠٢١ to May ٢٠٢١.

٨- Data analysis:

After data were collected, they were coded and transferred into specially designed formats so as to be suitable for computer feeding. Following data entry, checking and verification processes were carried out to avoid any errors during data entry, frequency analysis, cross tabulation and manual revision were all used to detect any errors. The statistical package for social sciences (SPSS version ٢٠) was utilized for both data

presentation and statistical analysis of the results. The level of significance selected for this study was P equal to or less than 0.05.

3. Results:

Demographic characteristics of the study population

Table (1) shows that more than tenth (11.0%) of the food handlers aged 40 years old and more, while only 4.0% of them aged less than 20 years old. About two thirds (60.0%) of the food handlers had university education and 4.0% of them had basic education. Additionally, more than one third (37.0%) of the food handlers were working for less than five years and 17.0% of them were working for ten to 10 years. The majority (96.0%) of the food handlers had no previous training courses and programs about food safety. Furthermore, the main sources of their knowledge about food safety and food temperature control were public internet sites (98.0%), followed by food inspectors (00.0%), friends (36.0%), and training courses (30.0%).

Knowledge level of the studied food handlers

Figure (1) illustrates that more than one quarter (26.0%) of the food handlers had low level of knowledge compared to 16.0% of had high knowledge level. While, more than half

(08.0%) of them had moderate knowledge level.

Reported practice level of the studied food handlers

Figure (2) shows that around two thirds (66.0%) of the food handlers poor practice level regarding food safety and only 4.0% had good practice. On the other hand, more than one quarter (30.0%) of the food handlers had fair practices.

Attitude level of the studied food handlers:

Figure (3) shows that vast majority (98.0%) of the food handlers had positive attitude towards food safety (2.0%) had neutral attitude.

Comparison between knowledge, attitude and practice levels of food handlers by type of restaurants regarding food safety.

Table (2) reveals that more than one quarter (28.6%) of food handlers working in international restaurants compared to 3.9% of those working in local restaurants had good knowledge regarding food safety, with a statistically significant difference between them ($X^2 = 28.69$, $P = 0.000$). Additionally, more than one third (34.7%) of the food handlers in international restaurants compared to the vast majority (96.1%) of those working in local restaurants had poor food safety, with a statistically significant

difference between them ($X^2 = 42.02$, $P = 0.000$).

Moreover, the same table portrays that all (100%) food handlers working in international restaurants compared to 96.1% of those working in local restaurants had positive attitude towards food safety.

Table (3): illustrated the relation between the sociodemographic characteristics of food handlers and their mean & SD for knowledge, practices and attitude levels.

Concerning food handlers' knowledge, it was noticed that higher knowledge mean scores was observed among food handlers aged 40 years and more compared to those aged less than 20 years (4.60 ± 1.663 , and 3.00 ± 0.977 respectively), with a statistically significant relation between food safety knowledge and age of the food handlers ($F = 2.489$, $P = 0.037$). Moreover, the food handlers with university education showed higher knowledge mean score in comparison to those with basic education (4.07 ± 1.100 , and 3.14 ± 1.074 respectively), with a statistically significant relation between food safety knowledge and level of education of the food handlers ($F = 3.870$, $P = 0.024$). The same table reveals a statistically significant relation between the food handlers' knowledge regarding food safety and

temperature control and duration of work in the restaurants ($F = 2.692$, $P = 0.001$) where, food handlers working in newly opening restaurants (less than 5 years) had higher knowledge mean score than those working in old restaurants (10-15 years) (4.68 ± 1.226 , and 3.24 ± 1.602 respectively). Furthermore, trained food handlers had higher knowledge mean score than non-trained ones (4.37 ± 1.189 , and 4.33 ± 1.462 respectively).

Regarding food handlers' practice, it was found that the younger the age of the food handlers the lesser practice mean score where food handlers aged 20 to less than 20 years had practice mean score 2.00 ± 0.000 compared to 6.00 ± 2.479 of those age 40 years and more. Additionally, a statistically significant relation was found between food handlers' food safety practices and their level of education ($F = 2.377$, $P = 0.001$), where the food handlers with university education had the highest practice mean score (6.62 ± 0.374). Moreover, food handlers working in new restaurants had better food safety practice mean score than those working in old restaurants (6.49 ± 0.388 , and 1.30 ± 3.823 respectively) with a statistically significant relation between the food handlers' practices regarding food safety and temperature control and duration of work in

the restaurants ($F= 3.922$, $P = 0.023$). The same table reveals that food handlers who received training about food safety and food temperature control had higher practice mean score than those who did not receive any training (0.00 ± 0.361 , and 3.09 ± 0.38 respectively).

With respect to attitude towards food safety and food temperature control, it was noticed that food handlers aged 20 to less than 20 years old had lower attitude mean score compared to those aged 40 years and more (28.0 ± 1.882 , and 30.0 ± 3.009 respectively). The same was found in level of education, where food handlers with basic education had lower attitude mean score than those with university education (28.0 ± 2.079 , and 29.0 ± 2.944 respectively). Furthermore, higher attitude mean score was noticed among food handlers working in newly opened restaurants (< 0 years) in comparison to those working in older restaurants ($10-10$ years) (28.8 ± 2.243 , and 28.3 ± 1.921 respectively). Lastly, food handlers who reported previous training on food safety and food temperature control had slightly higher attitude mean score than those who did not have such training (28.8 ± 1.937 , and 28.0 ± 2.201 respectively).

Table (4): shows the relationship between the food handlers' knowledge mean scores and their practice and attitude level regarding food safety. The table reveals a significant relation between the food handlers' knowledge mean score and their food safety practices ($F= 10.940$, $P= 0.000$) where food handlers with good practices had higher knowledge mean score (26.00 ± 0.816) compared to those with poor practice (3.94 ± 1.424).

Moreover, higher knowledge mean score was noticed among food handlers with positive attitude toward food safety compared to those with neutral attitude (4.37 ± 1.373 , and 3.00 ± 1.414 respectively).

Table (5): shows a statistically significant correlation between the food handlers' knowledge mean scores and their practice ($r= 0.407$, $P = 0.000$), while, no correlation was found between the food handlers' attitude and their knowledge or practice regarding food safety.

Table (6): shows the association between knowledge regarding food safety and characteristics of the study sample. It was explored using logistic regression analysis (Enter method) with good knowledge as the dependent variable. The R^2 value is 0.341 which means that only 34.1% of the

variability in the outcome is explained by the studied characteristic. It was noticed that only one variable was found to be predictors of good knowledge namely type of restaurants ($P= 0.001$).

Table (V): shows the association between practice regarding food safety and control of food temperature and characteristics of the study sample using logistic regression analysis (Enter method) with good practice as the dependent variable. The R^2 value is 0.003 which means that only 0.3% of the variability in the outcome is explained by the studied characteristic in the model. It was noticed that two variables were significantly predicting good practices namely type of restaurants ($P= 0.001$) and level of education of food handlers ($P= 0.013$).

Table (A): shows the association between attitude towards food safety and control of

food temperature and characteristics of the study sample using logistic regression analysis (Enter method) with positive attitude as the dependent variable. The R^2 value is 0.060 which means that only 6.0% of the variability in the outcome is explained by the studied characteristic in the model. It was noticed that no variables were predicting positive attitude towards food safety and control of food temperature

.

Table (١): Comparison between the studied food handlers by type of restaurants according to their basic data:

Items	Food handlers at				Total (n=100)		Test of significance
	International restaurants (n=49)		Local restaurants (n=51)				
	No	%	No	%	No	%	
Age							
- 20	1	2,0	3	5,9	4	4,0	$X^2 = 10,088$ $P= 0,073$
- 20-	8	16,3	10	19,4	18	18,0	
- 30-	22	44,9	14	27,5	36	36,0	
- 30-	10	20,6	11	21,7	21	21,0	
- ≥ 40	3	6,1	8	15,7	11	11,0	
Educational level							
- Basic education	2	4,1	0	9,8	2	2,0	$X^2 = 7,310$ $P= 0,026*$
- Secondary education	11	22,4	22	43,1	33	33,0	
- University education	36	73,5	29	57,1	65	65,0	
Duration of work in the restaurant (years)							
- <5	23	46,9	14	27,5	37	37,0	$X^2 = 7,004$ $P= 0,030*$
- 5-	22	44,9	24	47,1	46	46,0	
- 10-15	8	16,2	13	25,5	21	21,0	
Have previous training on food safety							
- No	45	91,8	51	100,0	96	96,0	$X^2 = 4,337$ $P= 0,037*$
- Yes	4	8,2	0	0,0	4	4,0	
Sources of information about food safety#							
- Government websites	4	8,2	0	0,0	4	4,0	$X^2 = 13,446$ $P= 0,097$
- TV	2	4,1	0	0,0	2	2,0	
- Public internet sites	48	98,0	50	98,0	98	98,0	
- Friends	20	40,8	16	31,4	36	36,0	
- Family	2	4,1	1	2,0	3	3,0	
- Food inspectors	31	63,3	24	47,1	55	55,0	
- Training course	21	42,9	9	17,6	30	30,0	
- Scientific websites	4	8,2	1	2,0	5	5,0	
- Social media	7	14,3	1	2,0	8	8,0	

 X^2 Chi square test * Significant p at $\leq ٠,٠٥$

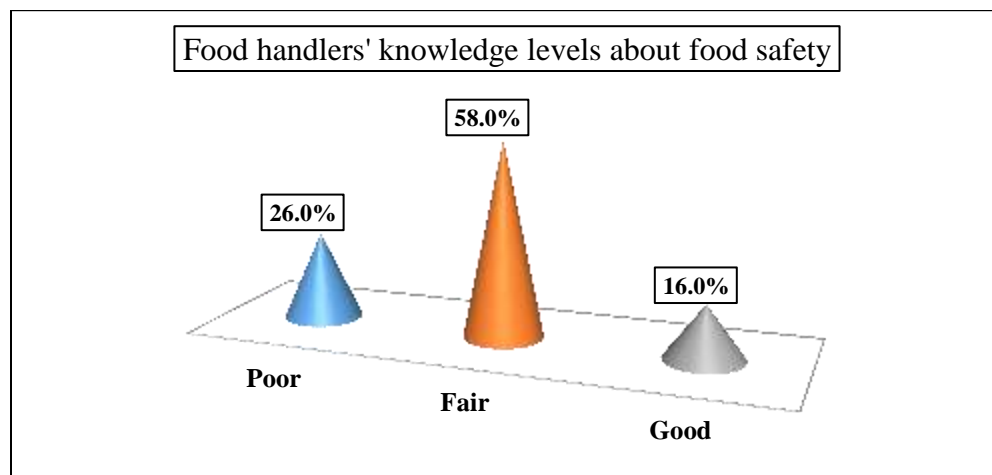


Figure ١: Distribution of the studied food handlers according to their knowledge level

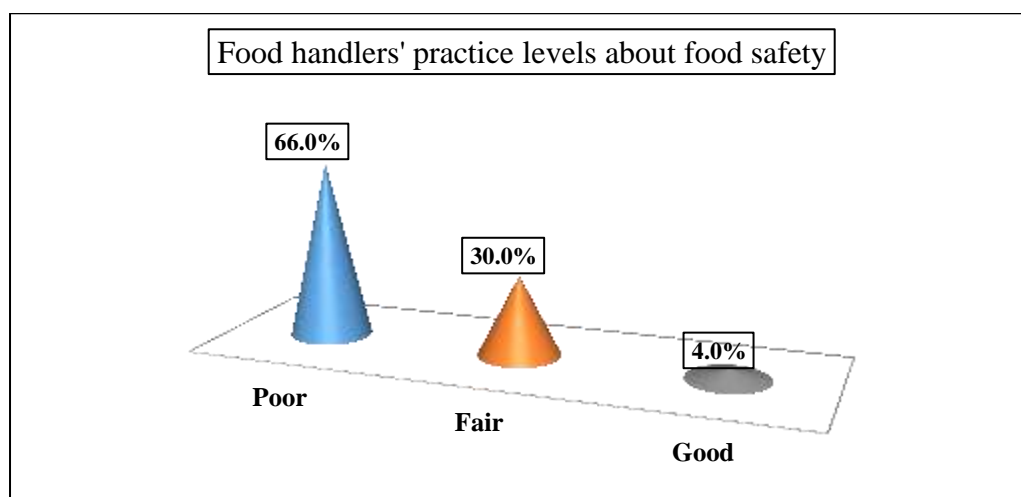


Figure ٢: Distribution of the studied food handlers according to their practice level

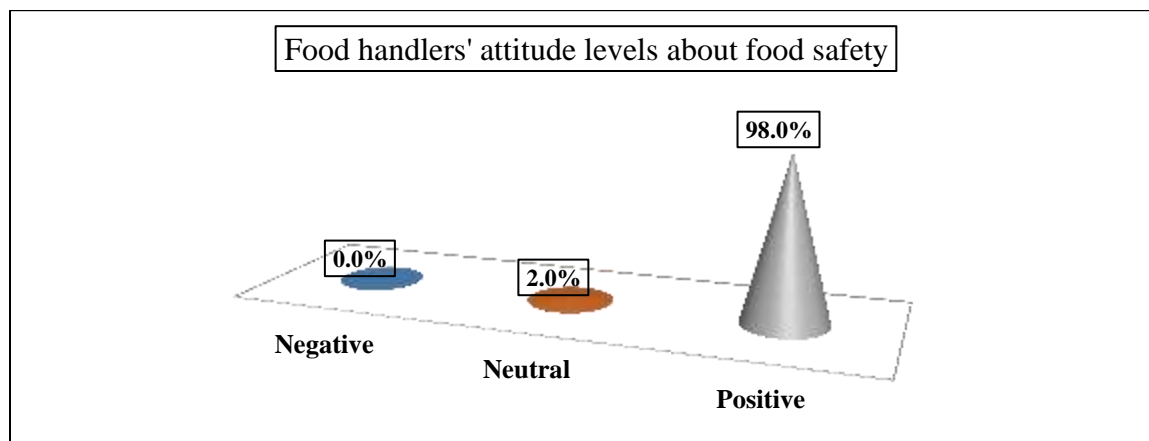


Figure ٢: Distribution of the studied food handlers according to their attitude level

Table (٢): Comparison between the studied food handlers by type of restaurants according to their knowledge, attitude and practice levels regarding food safety:

Items	Type of restaurants				Test of significance
	International (n=٤٩)		Local (n=٥١)		
	No	%	No	%	
Knowledge level					
- Poor	٢	٤,١	٢٤	٤٧,١	$X^2 = ٢٨,٦٩$ P= ,...*
- Fair	٣٣	٦٧,٣	٢٥	٤٩,٠	
- Good	١٤	٢٨,٦	٢	٣,٩	
Mean ±SD	٥,٠٦± ٠,٨٢٧		٣,٦٥±١,٤٥٤		t = ٣٥,٣٧٢ P= ,...*
Practice level					
- Poor	١٧	٣٤,٧	٤٩	٩٦,١	$X^2 = ٤٢,٠٢٥$ P= ,...*
- Fair	٢٨	٥٧,١	٢	٣,٩	
- Good	٤	٨,٢	٠	٠,٠	
Mean ±SD	٧,٩٢± ٤,٦٩٠		١,٥٥±٢,٢٣٠		t = ٨,٧٢٨ P= ,...*
Attitude level					
- Negative	٠	٠,٠	٠	٠,٠	$X^2 = ١,٩٦١$ P= ٠,١٦١
- Neutral	٠	٠,٠	٢	٣,٩	
- Positive	٤٩	١٠٠,٠	٤٩	٩٦,١	
Mean ±SD	٢٨,٨٤± ٢,١٣٥		٢٨,٣٣±٢,١٦٩		t = ١,٣٦٧ P= ٠,٢٤٥

χ^2 Chi square test t = Student t test * Significant p at $\leq ٠,٠٥$

Table (3): Relation between the sociodemographic characteristics of food handlers and their mean & SD for knowledge, practices and attitude as regard food safety:

Items	Knowledge Mean Score	Practice Mean Score	Attitude Mean Score
	Mean \pm SD	Mean \pm SD	Mean \pm SD
Age			
- 20-	3,00 \pm 0,077 4,43 \pm 1,409	2,00 \pm 0,000 3,48 \pm 0,607	28,0 \pm 1,882 28,7 \pm 1,874
- 20-	4,47 \pm 1,341	4,08 \pm 0,139	28,8 \pm 2,477
- 30-	4,00 \pm 1,174	0,11 \pm 0,103	29,7 \pm 1,947
- 30-	4,60 \pm 1,773	6,00 \pm 3,479	30,0 \pm 3,009
- ≥ 40			
Test of significance	F= 2,489 P= 0,037*	F= 1,743 P= 0,106	F= 1,377 P= 0,240
Educational level			
- Basic education	3,14 \pm 1,074	0,00 \pm 0,000	28,0 \pm 2,079
- Secondary education	4,18 \pm 1,090	2,39 \pm 4,301	28,7 \pm 2,180
- University education	4,07 \pm 1,100	0,72 \pm 0,374	29,0 \pm 2,944
Test of significance	F= 3,870 P= 0,024*	F= 7,377 P= 0,001*	F= 0,144 P= 0,866
Duration of work in the restaurant (years)			
- <0	4,68 \pm 1,227 4,48 \pm 1,220	0,49 \pm 0,388 4,13 \pm 0,128	28,8 \pm 2,243 28,7 \pm 2,400
- 0-	3,24 \pm 1,602	1,30 \pm 3,823	28,3 \pm 1,921
- 10-10			
Test of significance	F= 7,692 P= 0,001*	F= 3,922 P= 0,023*	F= 0,088 P= 0,908
Previous training programs about food safety			
- No	4,33 \pm 1,472 4,37 \pm 1,189	3,09 \pm 0,038 0,00 \pm 0,371	28,0 \pm 2,201 28,8 \pm 1,937
- Yes			
Test of significance	t= 0,016 P= 0,900	t= 2,918 P= 0,009	t= 0,444 P= 0,657

F = ANOVA test t = Student t test * Significant p at $\leq 0,05$

Table (٤): Relation between knowledge mean scores and practice and attitude levels regarding food safety:

Items	Knowledge Mean Scores
	M ± SD
Practice level	
- Poor	٣,٩٤ ± ١,٤٢٤
- Fair	٥,٠٠ ± ٠,٨٣٠
- Good	٦,٠٠ ± ٠,٨١٦
Test of significance	F= ١٠,٩٤٠ P= ٠,٠٠٠*
Attitude level	
- Neutral	٣,٠٠ ± ١,٤١٤
- Positive	٤,٣٧ ± ١,٣٧٣
Test of significance	F= ١,٩٤٤ P= ٠,١٦٦

F = ANOVA test t = Student t test * Significant p at ≤ ٠,٠٥

Table (٥): Correlation Matrix between knowledge and practice and attitude regarding food safety:

		Knowledge of food safety	Practices of food safety	Attitude toward food safety
Knowledge of food safety	r			
	P			
Practices of food safety	r	٠,٤٠٧		
	P	٠,٠٠٠*		
Attitude toward food safety	r	٠,٠٧٢	٠,١٧٤	
	P	٠,٤٧٥	٠,٠٨٣	

r = Pearson correlation* Significant p at ≤ ٠,٠٥

r ≥ ٠,٩ very high correlation r ٠,٧- < ٠,٩ high correlation r ٠,٥- < ٠,٧ moderate correlation r < ٠,٥ low correlation

Table (٦): Predictors of good knowledge regarding food safety (regression analysis):

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	٤,٩٩٨	١,٨٩١		٢,٦٤٤	٠,٠١٠
Type of restaurant	١,١٣٢	٠,٣٢٨	٠,٤١٢	٣,٤٥٢	٠,٠٠١*
Age	٠,٠٠٣	٠,١٥٤	٠,٠٠٢	٠,٠٢٠	٠,٩٨٤
Level of education	١,٢٥٦	٠,٢١٣	٠,٢١٦	٢,١٩٩	٠,٠٢٣
Duration of restaurant activity	-٠,٢٨٩	٠,٢٤٥	-٠,١٤٩	-١,١٨٠	٠,٢٤١
Previous training courses about food safety	٠,٤٢٠	٠,٢٨٤	٠,١٤٠	١,٤٧٨	٠,٤٣١

R = ٠,٥٨٤ R² = ٠,٣٤١**Table (٧): Predictors of good practice regarding food safety (regression analysis):**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	١٠,٦٤٧	٥,٩٢٧		١,٧٩٦	٠,٠٧٦
Type of restaurant	٦,٧٣١	٠,٩٣٨	٠,٦٥٢	٧,١٧٦	٠,٠٠٠*
Age	٠,١٣١	٠,٤٧٥	٠,٠٢٧	٠,٢٧٦	٠,٧٨٣
Level of education	١,٦٣٧	٠,٦٤٧	٠,١٩٨	٢,٥٢٩	٠,٠١٣*
Duration of restaurant activity	-٠,١٠٧	٠,٧٦٢	-٠,٠١٥	-٠,١٤٠	٠,٨٨٩
Previous training courses about food safety	٠,٧٢٧	٠,٨٧٨	٠,٠٦٥	٠,٨٢٩	٠,٤٠٩

R = ٠,٧٤٣ R² = ٠,٥٥**Table (٨): Predictors of positive attitude toward food safety (regression analysis):**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	٣٠,٥٤٣	١,٧١٨		١٧,٧٨٢	٠,٠٠٠
Type of restaurant	٠,٤٧٩	٠,٦٤٣	٠,١١٢	٠,٧٤٤	٠,٤٥٩
Age	٠,٤٥٦	٠,٢٨٤	٠,٢٢٣	١,٦٠١	٠,١١٣
Level of education	٠,٢٧٦	٠,٣٩٨	٠,٠٨٠	٠,٦٩٢	٠,٤٩٠
Duration of restaurant activity	٠,٤٣٩	٠,٤٥٣	٠,١٤٥	٠,٩٦٨	٠,٣٣٦
Previous training courses about food safety	٠,٢٢٥	٠,٥٣٣	٠,٠٤٨	٠,٤٢١	٠,٦٧٥

R = ٠,٢٥٤ R² = ٠,٠٦٥

Discussion

When food is cooked on a large scale, it may be handled by many individuals and thus increasing the chances of contamination of the final food. Unintended contamination of food during large-scale cooking, leading to food-borne disease outbreaks can pose danger to the health of consumers and economic consequence for nations^(٢٩).

Hence, it becomes a necessity to provide food handlers with at least the basic knowledge of proper food safety methods. In other words, food service employees should be trained to have the knowledge needed in undertaking their tasks and to attain skills improving their practices of food handling. So, knowledge, attitude and practice of food handlers, play dominant role in food safety with regards to food service safety^(٣٠)

Concerning the food handlers' knowledge regarding food safety and proper food temperature control, the results of the present study showed that more than one quarter of the food handlers had poor knowledge regarding food safety and less than one fifth of them had good knowledge level. This could be explained by the educational level of the food handlers where more than half of them were from basic and secondary education, which may affect their knowledge level. Moreover, this low

knowledge level may be because the studied food handlers stated that their main source of data were public internet websites which may project incorrect or invalid information. This finding shed the light on the role of media in the dissemination of information and in promotion of services, thus, more attention and supervision should be placed on social media and public websites. This result was consistent with those of **Insfran-Rivarola, et al., ٢٠٢٠** who found that food handlers with higher educational levels were more knowledgeable, this was reflected in the current study findings, which found a statistically significant relation between the food handlers' knowledge and their level of education^(٣١). These results were supported by those of **Cunha et al., ٢٠١٥ & Kunadu et al., ٢٠١٦** who found a positive correlation between the food handlers' knowledge level and their level of education^(٣٢, ٣٣).

Food safety practices are extremely important to ensure that the food produced is safe for the consumer. The current study findings showed that around two thirds of the food handlers had poor food safety practices. These findings may be explained in the light of lower educational level of the studied food handlers as the current study found a statistically significant relation

between the level of practice and level of education of the food handlers. Another factor may contribute to this low practice level is the food handlers' lower knowledge level regarding food safety and food temperature control. These findings were contradicting those of **LING et al., (٢٠٢١)** & **Ahmed et al., (٢٠٢١)** and **Kwol et al., (٢٠٢٠)** who found a high practice levels among respondents.^(٣٤, ٣٥, ٣٦)

Food safety attitudes is also a crucial factor that may influence food safety behavior and practice, thus decrease the occurrence of foodborne diseases and other health hazards (**Younes et al., ٢٠٢١** & **Yusof et al., ٢٠١٨**)^(٣٧, ٣٨). The current study found that the vast majority of the studied food handlers had positive attitude towards food safety and temperature control. This positive attitude toward food safety may motive the food handlers to enhance their knowledge level which in turn will reflect on their practices, and thus contribute to the prevention of food borne diseases. This finding is consistent with those of **Zanin et al., (٢٠١٧)** & **Aquino et al., (٢٠٢١)** ^(٣٩, ٤٠).

Knowledge accumulates through learning processes and these may be formal or informal instruction, personal experience e and experiential sharing. Knowledge is

automatically translated into behavior and shaped attitudes. Knowledge is vital in the cognitive processing of information in the attitude-behavior relationship **Kwol et al., (٢٠٢٠)**.^(٣٦) This was portrayed in the current study findings where food handlers with good food safety practices or those with positive attitude toward food safety and food temperature control had higher knowledge levels. Similar findings were reported by **Ali et al., ٢٠١٨**; **Al Kandari et al., ٢٠١٩** & **Akabanda et al., ٢٠١٧**), who found significant relations between knowledge, attitudes and behavior of food handlers ^(٤١-٤٣).

Furthermore, evidence drawn from the current study indicated that the higher the age of the food handlers, the higher the level of their knowledge and practices. Plausible explanation for such relation may be attributed to many reasons; older food handlers might have had better education, have good cognitive capacity and rich life experiences reflected in their higher knowledge and practice level. Similar findings were reported by **ZANIN et al., ٢٠١٧)** ^(٤٤). These findings suggest that younger food handlers and that lower level of education may require particular attention to enhance their knowledge and practices.

Training and education may be an effective tool to increase food safety knowledge among food handlers and thus improve food safety practices. The same picture was portrayed in the current study findings where food handlers who reported previous training about food safety had higher levels of food safety related knowledge and practices and these were reflected on their attitude. Similar findings were reported by **Al Kandari et al., ٢٠١٩**)^(٤٢), who found significant relationship between training of the studied subjects and their knowledge and practice level regarding food hygiene and sanitation.

Moreover, the current study findings reveal that the type of restaurants is among the factor that affects the food handlers' knowledge and practice levels regarding food safety and food temperature control. In addition, it was found that food handlers working in had higher knowledge and practice level. A possible explanation is the difference in the level of education between those working in international restaurants in comparison to those working in local restaurants, which would be reflected in their knowledge and practice level. Similar results were reported by **Ahmed et al., (٢٠٢١)** and **Kwol et al., (٢٠٢٠)** ^(٣٥,٣٦).

Conclusion:

Based upon the findings of the current study it could be concluded that lack of knowledge and attitude regarding food handler was being served as potential risk. Inadequate food safety knowledge by food handlers poses a serious threat to food safety in food preparation and service establishments such as restaurants. More than one quarter of the food handlers had poor knowledge regarding food safety and less than one fifth of them had good knowledge level. Around two thirds of the food handlers' poor practice level regarding food safety and controlling food temperature. More than one third of the food handlers in international restaurants compared to food handler working in local restaurants had poor food safety and food temperature control practice, with a statistically significant difference between them. All food handlers working in international restaurants had positive attitude towards food safety and controlling food temperature. Two variables were significantly predicting good practices namely type of restaurants and level of education of food handlers.

Recommendation: There is an urgent need of training program for food handlers and repeated at particular intervals to guarantee that learnt data is put into the day by day life

practices. Increasing awareness about safe food handling requires more attention and researches especially in developing countries.

References

١. Limon, M R. Food safety practices of food handlers at home engaged in online food businesses during COVID-١٩ pandemic in the Philippines. *Current Research in Food Science*, ٢٠٢١, ٤: ٦٣-٧٣.
٢. Mohammadi NA, Salmani F, Esfarjani FY. A quasi-experimental study on the effect of health and food safety training intervention on restaurant food handlers during the COVID-١٩ pandemic. *Food Science & Nutrition*, ٢٠٢١.
٣. Bender K E., et al. Consumer behavior during the COVID-١٩ pandemic: An analysis of food purchasing and management behaviors in US households through the lens of food system resilience. *Socio-Economic Planning Sciences*, ٢٠٢١, ١٠١١٠٧.
٤. Azanaw J, et al. Food Safety Knowledge, Attitude, and Practice of College Students, Ethiopia, ٢٠١٩: A Cross-Sectional Study. *BioMed Research International*, ٢٠٢١, ٢٠٢١
٥. Brizek M G., et al. Independent restaurant operator perspectives in the wake of the COVID-١٩ pandemic. *International Journal of Hospitality Management*, ٢٠٢١, ٩٣: ١٠٢٧٦٦.
٦. Nyalo M. Relationship between Knowledge, Attitudes and Practices on Food Safety among Food Handlers in Nairobi, Kenya: A Case Study of a Teaching and Referral Hospital. ٢٠٢٠. PhD Thesis. United States International University-Africa.
٧. Limon M R. Food safety practices of food handlers at home engaged in online food businesses during COVID-١٩ pandemic in the Philippines. *Current Research in Food Science*, ٢٠٢١, ٤: ٦٣-٧٣.
٨. Dewi N, Wayan B P; Ernawati, Ni Made M, I. Gede. Courtyard by Marriott Bali Nusa Dua Resort: A Support for Employee Productivity during the Covid-١٩ Pandemic. *Journal Bali Membangun Bali*, ٢٠٢١, ٢,١: ٢٩-٣٦.
٩. Maragoni S C, Serrano T, Matheus JRV, de Brito Nogueira TB, Xavier-Santos D, Miyahira RF, Costa Antunes AE, Fai AEC. COVID-١٩ pandemic sheds light on the importance of food safety practices: risks, global recommendations, and perspectives. *Crit Rev Food Sci Nutr*. ٢٠٢١ Feb ١٦; ();١-١٣.

١٠. Burke, A; Dworkin M. High school students as the target of an integrated food safety educational intervention: successful results of a pilot study. Food Prot. Trends, ٢٠١٦, ٣٦,٣: ٢٠٦-٢٢٠.
١١. Teffo, L A.; Tabit, F T. An assessment of the food safety knowledge and attitudes of food handlers in hospitals. BMC public health, ٢٠٢٠, ٢٠,١: ١-١٢.
١٢. Chenarides L, Grebitus C, Lusk JL, Printezis I. Food consumption behavior during the COVID-١٩ pandemic. Printezis I Agribusiness (N Y N Y) ٢٠٢٠ Dec ١٥
١٣. Buheji, M. Stopping future COVID-١٩ like pandemics from the Source-A Socio-Economic Perspective. Am. J. Econ, ٢٠٢٠, ١٠,٣: ١١٥-١٢٥.
١٤. <https://www.delta-net.com/health-and-safety/food-safety-topic/faqs/why-is-food-safety-and-hygiene-important>.
١٥. Sharma, A., et al. Hand Contamination among Food Handlers: A Study on the Assessment of Food Handlers in Canteen of Various Hospitals in Solapur City, Maharashtra. Journal of Pure and Applied Microbiology, ٢٠٢١, ١٥,٣: ١٥٣٦-١٥٤٧.
١٦. Mardu, F, et al. Assessment of knowledge, practice, and status of food handlers toward Salmonella, Shigella, and intestinal parasites: A cross-sectional study in Tigray prison centers, Ethiopia. PloS one, ٢٠٢٠, ١٥,١١: e٠٢٤١١٤٥.
١٧. El-Latief, A, et al. The Effect of Street Foods Vendors Practices on the Spread of Pollutants under the Covid-١٩ Pandemic in Aswan Governorate in Egypt. International Journal of Tourism and Hospitality Management, ٢٠٢٠, ٣,٢: ٣٧١-٤٠٥.
١٨. Xavier, C AD, et al. Assessing the diversity of whiteflies infesting cassava in Brazil. PeerJ, ٢٠٢١, ٩: e١١٧٤١.
١٩. Mohamed L., et al. Educational Program to Prevent Food borne Diseases at Restaurants of Suez Canal University. ٢٠٢٠.
٢٠. Radulovic A, et al. Food safety at home: Serbian students. British Food Journal, ٢٠٢١.
٢١. W H O: Advocacy, communication and social mobilization for TB control: a guide to developing knowledge, attitude and practice surveys. http://whqlibdoc.who.int/publications/٢٠٠٨/٩٧٨٩٢٤١٥٩٦١٧٦_eng.pdf,
٢٢. Omar M, et al. Awareness and implementation of ionizing radiation safety measures among urology community in Egypt: nationwide survey. African Journal of Urology, ٢٠٢١, ٢٧,١: ١-٧.
٢٣. Moaddel M, et al. The pandemic and the problem of compliance with safety

- measures: The case of Egypt. *Sociology of Health & Illness*, ٢٠٢١.
٢٤. Sarmiento J P, et al. Graduate certificate in local development planning, land use management and disaster risk management: a knowledge, attitude and practice (KAP) evaluation. *Disaster Prevention and Management: An International Journal*, ٢٠٢١.
٢٥. https://en.wikipedia.org/wiki/Faiyum_Governorate
٢٦. Sirichokchatchawan W.; Taneepanichskul N; Prapasarakul N. Predictors of knowledge, attitudes, and practices towards food safety among food handlers in Bangkok, Thailand. *Food Control*, ٢٠٢١, ١٢٦: ١٠٨٠٢٠.
٢٧. Aquino H V A, et al. Food safety knowledge, attitudes, practices and training of fast-food restaurant food handlers: a moderation analysis. *British Food Journal*, ٢٠٢١.
٢٨. Nkhebenyane J, et al. Street food handlers' food safety knowledge, attitudes and self-reported practices and consumers' perceptions about street food vending in Maseru, Lesotho. *British Food Journal*, ٢٠٢١.
٢٩. Mohd YH, et al. Antibacterial Potential of Biosynthesized Zinc Oxide Nanoparticles against Poultry-Associated Food borne Pathogens: An in Vitro Study. *Animals*, ٢٠٢١, ١١,٧: ٢٠٩٣.
٣٠. Gyebi, BEA, et al. Knowledge, attitude, and practices (KAP) of foodservice providers, and microbial quality on food served in Kumasi. *Journal of Foodservice Business Research*, ٢٠٢١, ٢٤,٤: ٣٩٧-٤١٣.
٣١. Insfran-R, A, et al. A systematic review and meta-analysis of the effects of food safety and hygiene training on food handlers. *Foods*, ٢٠٢٠, ٩,٩: ١١٦٩.
٣٢. Cunha, DT, et al. The existence of optimistic bias about foodborne disease by food handlers and its association with training participation and food safety performance. *Food Research International*, ٢٠١٥, ٧٥: ٢٧-٣٣.
٣٣. Kunadu, A, Parry-H, et al. Food safety knowledge, attitudes and self-reported practices of food handlers in institutional foodservice in Accra, Ghana. *Food Control*, ٢٠١٦, ٦٩: ٣٢٤-٣٣٠.
٣٤. Ling, S J; Hassan, Z., Regina, G. Food Borne Disease and the Lifestyles of the Students and Food Handlers in Rural Schools: A Preliminary Observation. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, ٢٠٢١, ٦,٩: ٤٣٠-٤٣٦.

٣٥. Ahmed, M H; Akbar, Ali S, Muhammad B. Cross sectional study on food safety knowledge, attitudes, and practices of food handlers in Lahore district, Pakistan. Heliyon, ٢٠٢١, ٥: ٨٤٢٠.
٣٦. Kwol, V S, et al. Another look into the Knowledge Attitude Practice (KAP) model for food control: An investigation of the mediating role of food handlers' attitudes. Food Control, ٢٠٢٠, ١١٠: ١٠٧٠٢٥.
٣٧. Younes N, et al. Socio-demographic influences on the prevalence of intestinal parasitic infections among workers in Qatar. Parasites & vectors, ٢٠٢١, ١٤, ١: ١-١٣.
٣٨. Yusof A M. Mohd; R, , Nor AA; Haque, M. Knowledge, attitude, and practice toward food poisoning among food handlers and dietetic students in a public university in Malaysia. Journal of pharmacy & bioallied sciences, ٢٠١٨, ١٠, ٤: ٢٣٢.
٣٩. Zanin, L M, et al. Knowledge, attitudes and practices of food handlers in food safety: An integrative review. Food Research International, ٢٠١٧, ١٠٠: ٥٣-٦٢.
٤٠. Aquino, H., Van A. Food safety knowledge, attitudes, practices and training of fast-food restaurant food handlers: a moderation analysis. British Food Journal, ٢٠٢١.
٤١. Ali, M A, et al. Food Safety Knowledge among Food Workers in Restaurants of Salalah Municipality in Sultanate of Oman. International journal of Horticulture, Agriculture and Food science, ٢٠١٨, ٢: ١-٦.
٤٢. Al-Kandari, D; AL-Abdeen, J; Sidhu, J. Food safety knowledge, attitudes and practices of food handlers in restaurants in Kuwait. Food control, ٢٠١٩, ١٠٣: ١٠٣-١١٠.
٤٣. Akabanda, F. ; Hlorts, E H. ; Owusu-Kwarteng, J. Food safety knowledge, attitudes and practices of institutional food-handlers in Ghana. BMC public health, ٢٠١٧, ١٧, ١: ١-٩.
٤٤. Zanin, LM., et al. Knowledge, attitudes and practices of food handlers in food safety: An integrative review. Food Research International, ٢٠١٧, ١٠٠: ٥٣-٦٢.

Effect of Educational Program on Nurses' Competency Regarding Providing Palliative Care for Children with Advanced Stage of Cancer

*Samar Abd-Elrahman Abd-Elrahman Radwan^١, Sahar Mahmoud El-Khedr Abd-Elgawad^٢,
Amal Abo-El-Azm Abd El-Rahman Younis^٣*

^١ *Demonstrator of Pediatric Nursing, Faculty of Nursing/ Tanta University, Egypt.*

^٢ *Professor of Pediatric Nursing, Faculty of Nursing/ Tanta University, Egypt.*

^٣ *Lecturer of Pediatric Nursing, Faculty of Nursing/ Tanta University, Egypt.*

Abstract

Background: Childhood cancer is a major stressful experience facing children. Application of pediatric palliative care encompasses physical, psychological, spiritual health of children with cancer and their family. Competency in palliative care focused on knowledge of palliative care, personal qualities and attributes and key skills to fulfill professional responsibility through practice. **The current study aims** to evaluate the effect of educational program on nurses' competency regarding providing palliative care for children with advanced stage of cancer.

Research design: A quasi experimental research design was used. **Subjects and method:** A convenience sampling of forty- five nurses working at Pediatric Hematology and Oncology Unit at Tanta main University Hospital and Tanta cancer center affiliated to Ministry of health and population were recruited in the current study. **Two Tools were used to collect data:** First tool is Structured Questionnaire Schedule to assess socio demographic characteristic and nurses' knowledge regarding childhood cancer and palliative care. Second tool is Palliative Care Competency checklist. **The results of the present study** revealed that the total score of nurses' knowledge had improved immediately and one month after implementing educational program. Statistical significant differences were found regarding all competency domain before, immediately and one month after implementing the educational program. **The study concluded** improvement of nurses' knowledge and competencies regarding providing palliative care for children with advanced stage of cancer. **The study recommended** applying competency based nursing intervention to children with advanced cancer and developing an educational program for parents.

Keywords: Advanced stage of cancer, Children, Educational program, Nurses' competency, Palliative care.

Introduction

Cancer is defined as a group of diseases in which there is uncontrolled growth and spread of abnormal cells and ultimately may result in death. Childhood cancer is a general term used to describe a range of cancerous and non-cancerous tumors found in children and may also called pediatric cancer.^(١)

Advanced cancer is a term used to describe cancer that is unlikely to be cured, but it can be controlled. It is occasionally called a chronic or long-lasting disease.^(٢) Cancer is considered the second-leading cause of death among children ages ١-١٤ years after accidents. In ٢٠٢١, it is estimated that ١٥,٥٩٠ children and adolescents ages ٠ to ١٩ years old were diagnosed with cancer and ١,٧٨٠ died of the disease in the United States (US).^(٣) According to national cancer registry program of Egypt, an overall ٤,٣٦٦ children with cancer were recorded from ٢٠١٦ till the end of ٢٠١٧.^(٤)

Causes of childhood cancer are slightly known but there are many predisposing factors that may lead to it.^(٥) The most common types of cancers that prevail in children are

leukemia, Neuroblastoma, wilms tumor, Non-Hodgkin lymphoma and Hodgkin lymphoma.^(٦) Treatment modalities include surgery, radiation therapy, chemotherapy, stem cell transplants and targeted therapy that attack specific cancer cells causing minimal harm to normal cells by using specific drugs or other substances.^(٧)

Pediatric palliative care is defined as an active and total approach to care, embracing physical, emotional, social, and spiritual elements. It focuses on enhancement of quality of life for the child and support for the family and includes management of distressing symptoms, provision of respite and care through disease, death and bereavement.^(٨, ٩) Providing palliative care to children with advanced cancer should be started as early as possible when cancer is firstly diagnosed regardless it's type or stage. Team approach of palliative care include palliative care consultant, general practitioners, and specialist nurse. In addition to; physiotherapy, speech and language therapy, occupational therapy, nutritionist and

dietetics, social workers besides respiratory care specialist.^(١١)

The roles of palliative care team include ongoing assessment of symptoms and integration of symptom control protocols to enable children to stay at home besides inpatient care for children with aggressive symptoms that cannot be adequately controlled at home and require more care, referral of children with severe symptoms to higher-level hospitals as well as training and supervision of the staff who provide palliative care at community health centers.^(١٠, ١١)

Nursing competency can be defined as nurse's ability to effectively demonstrate a set of attributes, such as personal characteristics, professional attitude, values, knowledge and skills and to fulfill professional responsibility through practice. Palliative care specialist nurses must have the basic knowledge and competency skills to assist children to have a normal life and a normal dying process and to be able to address all needs of children with advanced cancer and their families.^(١٢)

Significance of the study:

There is a clear need for a comprehensive pediatric palliative care strategy to support children with advanced cancer and their families. Previous studies found that, nurses have lacked knowledge and skills in providing palliative care for those children.^(١٣) The deficit in knowledge and skills underscore the need to promote knowledge and skills through continuing education and improving competencies related to palliative care practice.^(١٤) Hence, it is important to conduct an educational program for nurses about the pediatric palliative care to enhance their knowledge and competencies that could help children receive high quality competency based intervention that help them and their families to receive support through a difficult time.^(١٥, ١٦)

Aim of the study

The aim of this study was to: evaluate the effect of educational program on nurses' competency regarding providing palliative care for children with advanced stage of cancer.

Research hypothesis: Nurses' competency is expected to be improved after receiving the educational program regarding

providing palliative care for children with advanced stage of cancer.

Subjects and Method

A quasi-experimental research design was used in the present study. The study was conducted at Pediatric Hematology Unit at Tanta Main University Hospital and Tanta cancer center which Affiliated to the Ministry of Health and Population.

Sample: All nurses who are working in the previously mentioned settings during the study period (٣٠ nurses working at Pediatric Hematology and Oncology Unit and ١٥ nurses from Tanta Cancer Center).The studied nurses are working with children aged ٤-١٥ years, both sexes who are suffering from cancer.

Two tools were used in the current study as follow:

Tool I: Structured Questionnaire Schedule:

It was developed by the researcher after reviewing of recent and related literature (١٠,١٧,١٨) to assess nurses' knowledge before, immediately and one month after the educational program implementation. It was consisted of two parts:

Part (١) Socio-demographic characteristics of studied nurses:

Including nurses' age, sex, residence, educational level, working department, years of experience in oncology department, and previous training programs.

Part (٢) Nurses' knowledge regarding childhood cancer and palliative care:

It included data related to definition of cancer, common manifestation, sedation or opioid used for pain management, Palliative care definition, aim, purposes and principles, best time to integrate palliative care into child line of treatment, role of pediatric palliative care nurse, nursing interventions to relieve cancer pain, nausea and vomiting, and dyspnea, nursing interventions to improve psychological and spiritual health of children with advanced stage of cancer.

Scoring system:

Questionnaire sheet contained ١٤ questions; each question was scored from (٠-٢ grades). The correct and complete answer was scored (٢), while correct and incomplete answer was scored (١), and wrong or don't known answers were scored (٠).

The total score of Nurses' knowledge was calculated and classified into

- High level of knowledge considered from ٨٠% and more.
- Moderate level of knowledge considered from ٦٠ > ٨٠%.
- Low level of knowledge considered less than ٦٠%.

Tool II: Palliative Care Competency checklist:

It was developed by the researcher based on Palliative care competency framework ^(١٩) and Nurse's Core Competency in Palliative Care Scale ^(٢٠). It was used to evaluate nurses' competencies regarding palliative care before, immediately after and one month after implementing the educational program. This tool was used for nurses to self-report their nursing practice in relation to professional competency regarding palliative care. It included six core competency domains which are principles of palliative care domain, communication domain, optimizing comfort and quality of life domain, care planning and collaborative practice domain, loss, grief, and bereavement

domain and professional and ethical practice domain.

Scoring system:

Scoring system for nurses' competency by using Palliative care competency framework which consisted of (٦١ items); each item was scored by using a likert scale from ١ to ٣ in which never was scored ١, sometimes was scored ٢ and always was scored ٣.

The total score for nurses' competency was calculated and classified as follow:

- The total score \geq ٨٠% meant that, nurses are competent in palliative care.
- The total score $<$ ٨٠% meant that, nurses are incompetent in palliative care.

Method

The study was accomplished through the following steps:

١-Administrative process: An official permission was obtained from the dean of the Faculty of Nursing, Tanta University directed to administrators of Pediatric Hematology Unit at Tanta University Hospital and Tanta Cancer

Center to obtain their approval and cooperation for carrying out this study.

٢-**Ethical and legal considerations:**

Ethical approval to conduct the study was taken from ethical committee at the faculty of Nursing, Tanta University. Nurses were informed about the confidentiality of the information obtained from them. The nature of the study didn't cause any harm or pain to the entire sample. Nurses' informed consents to participate in this study were obtained after explanation of the aim and benefits of the current study. The nurses had the right to withdraw from the study at any time. Ethical committee approval was obtained

٣- **Tools Development:** Study tools (I & II) were developed by the researcher after reviewing of recent literatures. (١٧-٢١)

٤-**Content validity:** The tools of the study were presented to a jury of five experts in the field of Pediatric Nursing to check content validity and clarity of the questionnaire. Modifications were carried out accordingly. Content validity index = ٩٨,٥%.

٥- **Content reliability:** The study tools were tested by the pilot subjects. The test of reliability (cronbach's alpha) was ٠,٩٧٥ that indicates high reliability of the tools.

٦- **Pilot study:** A pilot study was carried out on five nurses (١٠%) of the sample to test the tool for its clarity, applicability, feasibility and the necessary modifications were done. Pilot study was excluded from the total sample of the study.

Phases of the study: The study was conducted through four phases:

١.**AssessmentPhase:**It was carried out by the researcher for all study subjects to collect baseline data, and to assess nurses' knowledge related to palliative care provided to children with advanced cancer before, immediately and after one month from application of the program using Tool (I). Palliative care self-assessment checklist was filled by nurses before, immediately and after one month from application of the program. The researcher was available ٢ days per week alternatively in the previously mentioned settings using Tool (II).

٢.**PlanningPhase:**Educational intervention was developed after

extensive review of the related literature. It was designed according to nurses' needs assessment which included the following:

- Setting objectives of the educational program.
- Preparation of the content which covered the reasons behind the application of the session.
- Preparation of suitable media as (lecture, video, power point presentations, printed booklet with illustrated pictures).
- Palliative care competency checklist was administered in Arabic language.

٢. Implementation Phase:

- Before conducting the educational program, the researcher made need assessment (pretest) for each group separately using Tool (I) and Tool (II) and accordingly designed the plan for the educational sessions.
- The educational program was carried out for the studied nurses through conduction of successive educational sessions.
- Each session was started by feedback about the previous educational sessions' content and a summary about what had been discussed previously.

- Educational program was conducted in four sessions, twosessions / week. The time of each session was about ٣٠-٤٥ minutes including periods of discussion according to the nurses' progress and feedback.

- Different methods of teaching were used.

- The studied nurses were divided into nine groups; each group consisted of five nurses. Six groups from Hematology Pediatric Unit and three groups from Tanta cancer center.

The educational program sessions were carried out as follows:

- a. **First session:** it focused on definition of advanced cancer, pediatric palliative care, patho-physiology, types and manifestations of childhood cancer, goals and principles of palliative care, causes of cancer pain in children and its management and the best time to provide palliative care to children with advanced cancer.
- b. **Second session:** it focused on principles of palliative care a good communication skills.
- c. **Third session:** it focused on measures to optimize child's comfort, enhancing quality of his life and coordinating child's care.

- d. **Fourth session:** it focused on identifying impact of loss, grief and bereavement on child's family and siblings and address potential ethical issues that may be encountered.

4. Evaluation Phase: Evaluation of nurses' competency was carried out using the same tools. Each nurse was evaluated immediately after implementation of the educational program and one month later, and these two evaluations will be compared to pre-test data

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 23). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison between two groups and more was done using Chi-square test (χ^2) for comparison between more than two means of parametric data. Significance was adopted at $p < 0.05$ for interpretation of results of tests of significance.⁽¹¹⁾

Results

Figure (1): It was evident that, nearly equal percentage of 26.7% of the studied nurses their age ranged between 30 - < 40, 40 - < 50, 50 - < 60 years with mean age of (40.333 ± 11.407) years.

Figure (2): It was clear that, about two thirds (66.7%) of the studied nurses had nursing diplom, 22.2% had a technical nursing institute education, while 10.6% of them had completed their university nursing education.

Figure (3): It was found that 20% and 24.4% of the studied nurses had 10 - < 20 and 20 - < 30 years of experience respectively, while 26.7% and 28.9% had < 10 and 30 - < 40 years of experience respectively. The mean years of experience were 19.267 ± 11.063 years.

Table(1): Shows total knowledge of the studied nurses' regarding cancer and palliative care. It was noticed that 66.7% and 26.7% had low level and moderate level of total knowledge respectively before the educational program compared to all nurses (100%) and 91.1% of them had high level of total knowledge immediately and one month after implementing the

educational program respectively. There were highly statistical significant differences regarding nurses' knowledge between before and immediately, and one month after implementing the educational program ($P=0.000$). Also, statistical significant difference was found in the mean score of knowledge before, immediate, and one month after implementing the educational program respectively.

Table(2): Illustrates the mean score of the studied nurses regarding palliative care competency domains before, immediately and one month after implementing the educational program. There was highly statistical significant difference regarding principles of palliative care domain ($P=0.000$) with a high mean \pm SD 20.100 ± 1.106 immediately after educational program and 24.000 ± 1.323 one month later. Also, there was high statistical significant difference regarding communication domain of competency ($P=0.000$) with mean \pm SD 12.777 ± 3.002 , 22.333 ± 1.381 and 21.800 ± 1.272 before, immediately and one month after implementing the educational program respectively.

Concerning to optimizing comfort and quality of life domain of competency, there was highly statistical significant difference ($P=0.000$) with mean \pm SD 23.844 ± 0.001 , 24.844 ± 2.200 and 24.022 ± 2.137 before, immediately and one month after implementing the educational program respectively and 16.900 ± 0.480 , 29.422 ± 1.909 and 28.000 ± 2.607 respectively regarding care planning and collaborative practice. This table also shows that there was high statistical significant difference regarding loss, grief and bereavement domain of competency and professional and ethical practice in the context of palliative care domain of competency before, immediately and one month after implementing the educational program. Percentages of nurses according to levels of palliative care competency before, immediately after, and one month after implementing the educational program was shown in **table (3)**. It was apparent that 86.7% weren't competent in providing palliative care before the educational program compared to 100% and 88.9% of the studied nurses who were competent in providing palliative care

immediately and one month after implementing the educational program respectively. As regards mean competencies scores, before the educational program was 100.68 ± 22.82 compared to 166.64 ± 6.19 and 161.77 ± 7.71 immediately and one month after the implementing the educational program. There were high statistical significant differences in mean scores of nurses' competencies regarding palliative care before, immediately after and one month after implementing the educational program ($P=0.000$).

Table(4): Reflects the correlation between nurses' socio-demographic data and total knowledge score before, immediate, and one month after the program among the studied nurses regarding palliative care. It was clear that there were significant positive correlations between nurses' age and both educational level, and experience levels ($P=0.000$). Positive correlation was also found between educational level, working unit, and experience. Also, significant positive correlation was evident between nurses' total knowledge, educational level, working

unit, and experience level before the program. This may be explained by educational level and experience at working unit affect nurses' total knowledge before the program, while immediately and one month after program, all nurses' total knowledge improved regardless educational and experience level.

Correlation between nurses' socio-demographic data and total competencies score before, immediate, and one month after the program regarding palliative care was presented in **table (5)**. It was observed that there were significant positive correlations between nurses' age and both educational and experience level. Also, there were significant positive correlations between educational level and both working unit and experience. This means that with increased experience and improved age, the nurses gain experience and improved competencies. There was significant positive correlation between total nurses' competency and their age, working unit, and experience level before program implementation. While immediately and one month after

program implementation, there was significant positive correlation between nurses' competency and age and experience level. Also, there was significant positive correlation between total competency immediately after and total competency one month after program implementation.

nurses gain knowledge immediately and one month after the educational program then level of competence also improved

Table (٦): Presents correlation between total nurses' knowledge and competencies score before, immediate, and one month after the program. It was apparent that there was significant positive correlation between total competency before and total knowledge before the implementation of the educational program. Positive correlation was also evident between total competency immediately after and total competency one month after the educational program. It was clear that total competencies immediately after program had positive correlation with total competencies one month after and total knowledge score immediately after and one month later. Positive correlation also, found between total competencies and total knowledge one month after program implementation. This means that when

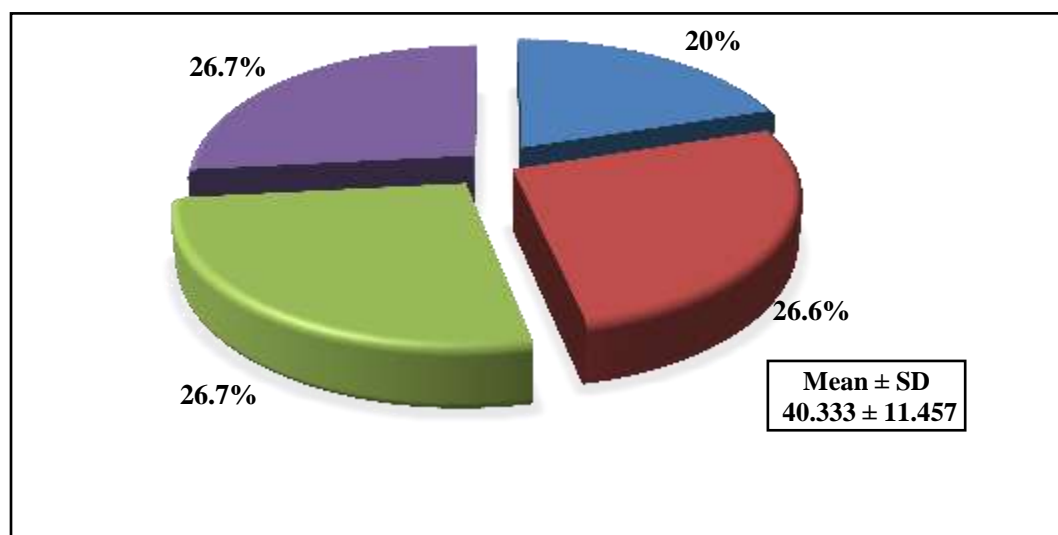


Figure (١): Percentage distribution of the studied nurses according to their age (n=٤٥)

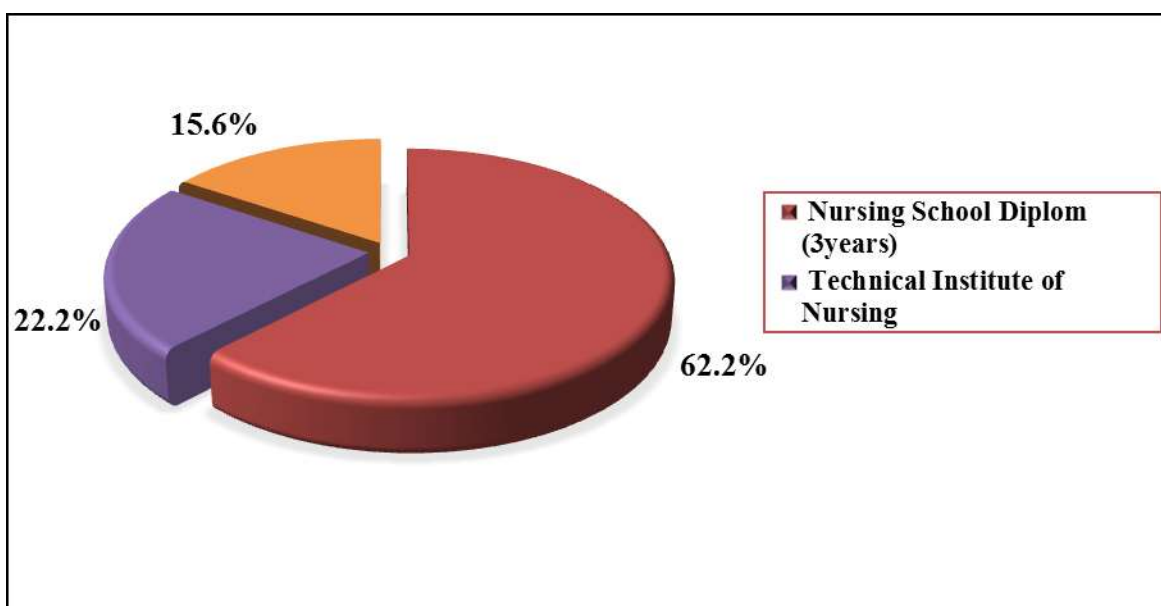


Figure (٢):Percentage distribution of the studied nurses according to their educational level (n=٤٥)

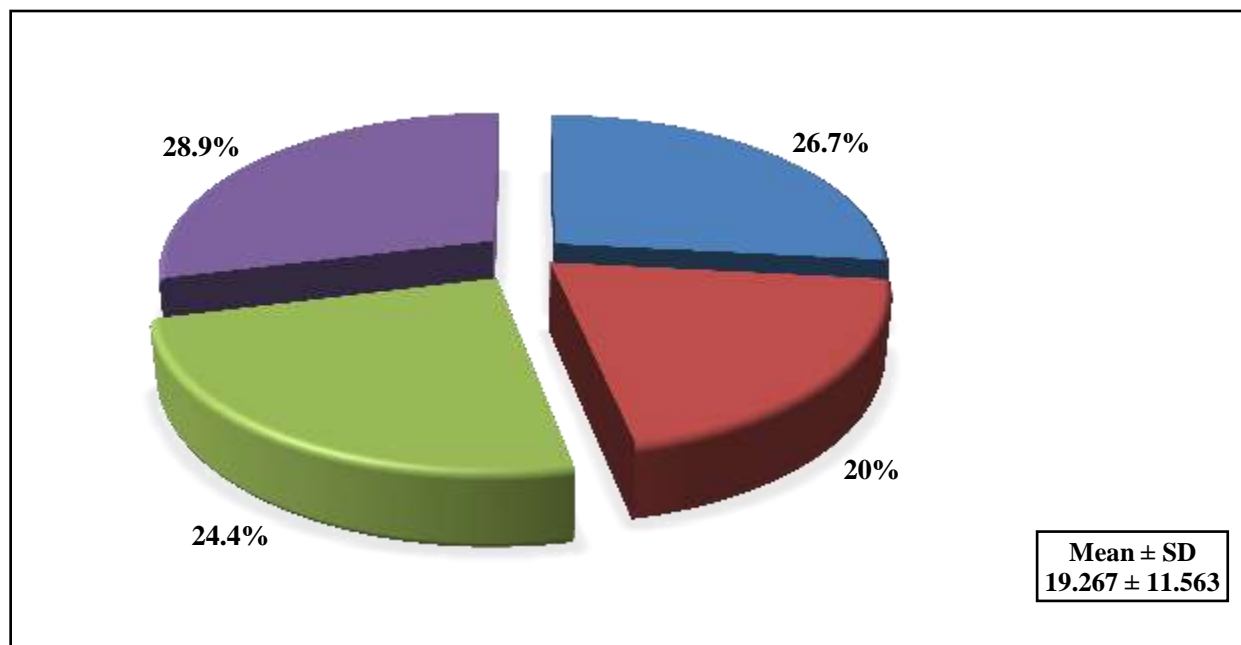


Figure (٣):Percentage distribution of the studied nurses according to their experience in years
(n=٤٥)

Table (١): Total knowledge scores of the studied nurses regarding cancer and palliative care.

Levels of total knowledge	Before educational program (n=٤٥)		Immediate after educational program (n=٤٥)		One month after educational program (n=٤٥)		I	II	III
							χ^2 P	χ^2 P	χ^2 P
	No	%	No	%	No	%			
Low level of knowledge	٢٨	٦٢,٢	٠	٠,٠	٠	٠,٠			
Moderate level of knowledge	١٢	٢٦,٧	٠	٠,٠	٤	٨,٩	٧٢,٠٠٠ ٠,٠٠٠١**	٦٠,١٧٤ ٠,٠٠٠١**	٤,١٨٦ ٠,٠٤١*
High level of knowledge	٥	١١,١	٤٥	١٠٠,٠	٤١	٩١,١			
Knowledge scores							F value P		
Mean \pm SD	١٦,٥٣٣ \pm ٣,٦٤		٢٧,٠٠٠ \pm ١,٢٧		٢٥,١١١ \pm ٢,٠١		٢٢١,١٨٣ ٠,٠٠٠١**		

*Statistically significant difference at ($P < ٠,٠٥$)** Highly statistically significant difference at ($P < ٠,٠٠١$)

- I Between before and immediate after

- II Between before and one month after

- III Between immediate and one month after

Table (٢): Mean score of the studied nurses regarding palliative care competency domains.

Nurses' competency	The studied nurses (n=٤٥)			F-value P
	Before educational program	Immediate after educational program	One month after educational program	
	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Principles of palliative care	١١,٧٣٣ \pm ٣,٤١٣	٢٥,١٥٥ \pm ١,١٠٦	- ٢٤,٥٥٥ \pm ١,٣٢٣	٥٣٠,٣٨٩ ٠,٠٠٠١**
Communication	١٢,٧٧٧ \pm ٣,٥٠٢	٢٢,٣٣٣ \pm ١,٣٨١	٢١,٨٠٠ \pm ١,٢٧٢	٢٤٦,٤٣٠ ٠,٠٠٠١**
Optimizing comfort and quality of life	٢٣,٨٤٤ \pm ٥,٥٠١	٤٠,٨٤٤ \pm ٢,٢٥٥	٤٠,٠٢٢ \pm ٢,١٣٧	٣١٠,٧٢٦ ٠,٠٠٠١**
Care planning and collaborative practice	١٦,٩٥٥ \pm ٥,٤٨٥	٢٩,٤٢٢ \pm ١,٩٥٩	٢٨,٥٥٥ \pm ٢,٦٠٧	١٦٠,٦١٥ ٠,٠٠٠١**
Loss, grief and bereavement	١٥,٩٣٣ \pm ٣,٠١٠	٢١,٨٠٠ \pm ١,٥٦٠	٢١,٢٦٦ \pm ١,٧١٠	٩٩,٤٨٠ ٠,٠٠٠١**
Professional and ethical practice in the context of palliative care	١٩,٤٤٤ \pm ٤,٥٩٥	٢٧,٠٨٨ \pm ٢,٤١٩	٢٥,٥٧٧ \pm ٣,٦٣٣	٥٥,٠٧٤ ٠,٠٠٠١**

**Highly statistically significant difference at ($P < ٠,٠٠١$)

Table (٣): Percentages and mean score of nurses regarding levels of palliative care competency.

Total nurses' competency regarding palliative care.	Before educational program (n=٤٥)		Immediate after educational program (n=٤٥)		One month after educational program (n=٤٥)		I χ^2 P	II χ^2 P	III χ^2 P
	No	%	No	%	No	%			
Competent	٦	١٣,٣	٤٥	١٠٠,٠	٤٠	٨٨,٩	٦٨,٨٢٤ ٠,٠٠٠١**	٥١,٤٠٣ ٠,٠٠٠١**	٥,٢٩٤ ٠,٠٢١*
Not competent	٣٩	٨٦,٧	٠	٠,٠	٥	١١,١			
Mean of nurses' competencies:							F value P		
Mean ± SD	١٠٠,٦٨ ± ٢٢,٨٢		١٦٦,٦٤± ٦,١٩		١٦١,٧٧± ٧,٧١		٢٩٤,٧٢٢ ٠,٠٠٠١**		

*Statistically significant difference at ($P < 0,05$)

** Highly statistically significant difference at ($P < 0,001$)

- I Between before and immediate after
- II Between before and one month after
- III Between immediate and one month after

Table (٤): Correlation matrix between nurses' socio-demographic data and total knowledge score before, immediate, and one month after the program (n=٤٥)

Variables		Age	Educational level	Residence	Working unit	Experience level	Total knowledge score before	Total knowledge immediate after
Educational level	r	.٦٤٢	-	-	-	-	-	-
	p	.٠٠٠١*	-	-	-	-	-	-
Residence	r	.٠٢٣	-.٠١٧	-	-	-	-	-
	p	.٨٨٠	.٩٠٩	-	-	-	-	-
Working unit	r	-.٢٧٩	.٥٠٤	.٠٠٠	-	-	-	-
	p	.٠٦٤	.٠٠٠١**	١,٠٠٠	-	-	-	-
Experience level	r	.٩٤٧	.٧٠٠	.٠٧٧	.٠٧٧	-	-	-
	p	.٠٠٠١*	.٠٠٠١**	.٦١٧	.٦١٧	-	-	-
Total knowledge score before	r	.١٥٥	.٦١٧	.١٠١	.٥٢٦	.٢٥٦	-	-
	p	.٣٠٨	.٠٠٠١**	.٥٠٧	.٠٠٠١**	.٠٠٠١**	-	-
Total knowledge immediate after	r	.٠٧٩	.١٦٤	-.٢٠٧	.٢٢٤	.٠٣٠	.١٧٥	-
	p	.٥٢٥	.٢٨١	.١٧٣	.١٤٠	.٨٤٤	.٢٤٩	-
Total knowledge one month after	r	.٠٤٣	.٠٩٠	-.١٠٧	.٠٥٥	.٠١٥	.١٧٤	.٢٠٣
	p	.٧٧٨	.٥٥٥	.٤٨٣	.٧١٩	.٩٢٣	.٢٥٢	.١٨١

**Correlation is significant at the ٠,٠٠١ level

*Correlation is significant at the ٠,٠٥ level

Table (٥): Correlation matrix between nurses' socio-demographic data and total competencies score before, immediate, and one month after the program (n=٤٥).

Variables		Age	Educational level	Residence	Working unit	Experience level	Total competencies score before	Total competencies score immediate after
Educational level	r	.٦٤٢	-	-	-	-	-	-
	p	.٠٠٠١**	-	-	-	-	-	-
Residence	r	.٠٢٣	-.٠١٧	-	-	-	-	-
	p	.٨٨٠	.٩٠٩	-	-	-	-	-
Working unit	r	-.٢٧٩	.٥٠٤	.٠٠٠	-	-	-	-
	p	.٠٦٤	.٠٠٠١**	١,٠٠٠	-	-	-	-
Experience level	r	.٩٤٧	.٧٠٠	.٠٧٧	-.٣٥٠*	-	-	-
	p	.٠٠٠١**	.٠٠٠١**	.٦١٧	.٠١٨	-	-	-
Total competencies score before	r	.٣٣٠	.٧٦٩	-.٠٣٨	.٥٥٥	.٤١١	-	-
	p	.٠٢٣*	.٠٠٠١**	.٨٠٢	.٠٠٠١**	.٠٠٥*	-	-
Total competencies score immediate after	r	.٣٩٧	.٢١١	-.٠٧٣	.٠٦٤	.٣٣٩	.٠٠٥	-
	p	.٠٠٧*	.١٦٥	.٦٣٣	.٦٧٦	.٠٢٣*	.٩٧٦	-
Total competencies score one month after	r	.٣٠٠	.٠٧٧	-.١١٤	.١٦٦	.٢٩٥	.١٢٧	.٨٢٠
	p	.٠٤٥*	.٦١٦	.٤٥٦	.٢٧٧	.٠٤٩*	.٤٠٦	.٠٠٠١**

**Correlation is significant at the .٠٠١ level

Table (٦): Correlation matrix between total nurses' knowledge and competencies score before, immediate, and one month after the program (n=٤٥).

Variables		Total competencies score before	Total competencies score immediate after	Total competencies score one month after	Total knowledge score before	Total knowledge immediate after
Total competencies score immediate after	r	.٠٠٥	-	-	-	-
	p	.٩٧٦	-	-	-	-
Total competencies score one month after	r	.١٢٧	.٨٢٠	-	-	-
	p	.٤٠٦	.٠٠٠١**	-	-	-
Total knowledge score before	r	.٨٢٥	.٢٣٠	.٢٥٠	-	-
	p	.٠٠٠١**	.١٢٩	.٠٩٨	-	-
Total knowledge immediate after	r	.٢٨٧	.٦١٢	.١١١	.١٧٥	-
	p	.٠٥٦	.٠٠١*	.٤٦٧	.٢٤٩	-
Total knowledge one month after	r	-.٠٢٤	.٥١١	.٤١٨	.١٧٤	.٢٠٣
	p	.٨٧٣	.٠٠٠١**	.٠٠٤*	.٢٥٢	.١٨١

** Correlation is significant at the ٠.٠٠١ level

* Correlation is significant at the ٠.٠٥ level

Discussion

Cancer is a term that describe a group of diseases in which abnormal cells divide without control, invade nearby tissues and spread to other parts of the body through the blood and lymph systems. The most common childhood cancers are leukemia, brain and other central nervous system tumors and lymphoma. More children cure cancer now than ever before due to new and better treatment modalities. One of these modalities is called palliative care.^(٢٢)

Pediatric palliative care is an emerging medical specialty that based on multidisciplinary team in nature and including medicine, nursing, social work, and others approaches. The focus of palliative care is to relieve suffering of children with cancer and promote the best quality of life for children and their families. Palliative care is appropriate at any childhood stage, and also at any stage of cancer. It can be provided along with curative treatment to child and his family.^(٢٣)

Continuous educational program for nurses keep them up to date on the latest advances in nursing care and treatment.^(٢٤) The present

study was conducted to evaluate the effect of educational program on nurses' competency regarding providing palliative care for children with advanced stage of cancer.

The present study showed that, mean age of the studied nurses was 40.33 ± 11.45 years. This finding was in accordance with **Dedeli et al (٢٠١٦)^(٢٥)** who made a study to assess nurses' attitudes towards patients with cancer and found that the average age of the nurses was 40.00 years. This result was contraindicated with **Al Qadire (٢٠١٣)^(٢٦)** and **Karkada' et al (٢٠١٢)^(٢٧)** whose studies revealed that the majority of the studied sample were younger adult which may be due to different sample and different setting.

Regarding nurses' educational level, the current study showed that less than two-thirds of the studied nurses had graduated from nursing school diplom while, less than one-fifth of them had completed their university nursing education and the rest of them had a technical nursing institute education. These results were supported by

Soubam (2018)⁽²⁸⁾ who found that the majority of nurses had graduated from nursing school diplom. **Bahza** (2013)⁽²⁹⁾ also, stated that nurses who had nursing diplom were the highest proportion in his study. **El-Nagar et al**(2013)⁽³⁰⁾ reported a contradicting finding in her study as she found most of the studied nurses had bachelor degree.

As regards to years of experience of the studied nurses inside Pediatric Hematology and Oncology Unit, it was observed that less than one third of the studied nurses had from 30 to less than 40 years of experience and one-fifth had from 10 to less than 20 years of experience. This result was in contrast with **Mahmoud** (2014)⁽³¹⁾ who mentioned that two-thirds of the studied nurses in his study had 9 years of specialty experience. **Premetal** (2012)⁽³²⁾ also, found that the majority of studied nurses in his study had from two - five years experiences at oncology department.

As regards, nurses' level of knowledge about childhood cancer and palliative care, the current study revealed that there was an improvement in the total level of nurses'

knowledge regarding the childhood cancer and palliative care immediately and one month after the implementation of educational program. While, less than two-thirds of them had low level of knowledge regarding childhood cancer and palliative care before the implementation of educational program. This may be attributed to the lack of specific palliative care units in Egypt, the fact that palliative care education wasn't incorporated into nursing curriculum, and lack of in-service educational program about childhood cancer and palliative care or training courses.

This finding was in agreement with **AlQadire** (2013)⁽³³⁾, **Karkada** (2012)⁽³⁴⁾, **Prem** (2012)⁽³⁵⁾, **Ayed** (2010)⁽³⁶⁾ and **Pfister** (2013)⁽³⁷⁾, whose studies assessed nurses' knowledge about palliative care and found that the overall level of knowledge about palliative care was poor. The current findings weren't in harmony with the findings of **Fadareet al**(2014)⁽³⁸⁾ and **Chover** (2014)⁽³⁹⁾ whose studies also assessed nurses' knowledge about palliative care, and found that the majority of nurses had good knowledge about palliative care.

The Present study revealed that, immediately and one month after the implementation of educational program, nurses total score of knowledge improved as all the nurses had high level of knowledge. This may be attributed to the use of multiple teaching methods, the development of educational program based on nurses' needs, the clarity and simplicity of its content, and the use of simple language and the frequent repetition to fix such knowledge.

This result was in agreement with **Ayed et al**(٢٠١٥)^(٢٣), **Saylor et al** (٢٠١٦)^(٢٤), **Sorifa et al**(٢٠١٥)^(٢٥) and **Brazil et al** (٢٠١٢)^(٢٦) , who found a significant improvement with the number of nurses who achieve a good score immediately and in the post period. This finding also agreed with the study conducted by **Young-Ran et al** (٢٠١٥)^(٢٧) who stated that, the knowledge of nurses was higher immediately after educational program implementation about palliative care and in the follow up period. **Joy**(٢٠١٥)^(٢٨) and **Kim et al.** (٢٠١٢)^(٢٩) were in the same line and found that nurses in the intervention group demonstrated a significant increase of

palliative care knowledge immediately and one month after the intervention.

As regards nurses' competency skills about pediatric palliative care, the current study showed that, most of the studied nurses weren't competent in providing palliative care before the implementation of the educational program. This finding could be explained by only a few nurses have been trained on palliative care, nurses do n't feel competent enough to deliver palliative care to children. Also, it may be attributed to increase work overload, and lack of periodic training and education. These findings were in the same line with **El-Nagar et al** (٢٠١٣)^(٣٠) who found that nurses weren't professional in providing palliative care. Also, **Anteneh et al** (٢٠١٦)^(٣١) agreed with this finding and stated that, more than half of the nurses in his study had poor practice toward palliative care.

On the other hand, there was an improvement in the total level of nurses' competency immediately and one month after the implementation of educational program than before. This finding was in the same line with **El-Nagar et al**(٢٠١٣)^(٣٢) who found that there was statistically

significant difference in pre/ post education relating to symptom management of cancer patients. Also, **Abaszadeh et al** (٢٠١٢)^(٤٤) was in harmony with the finding of the current study and showed that nurses' practice increased immediately and after one month of the educational program. This improvement may be attributed to that structured and continues nursing education are effective in improving the competency of the nurses.

The current study revealed that, there was no significant statistical correlation between nurses' age and total knowledge. This finding was in agreement with that of **Prem et al** (٢٠١٢)^(٣٧) who found no significant statistical correlations between palliative care total knowledge scores and age. This finding wasn't in line with **Soubam et al** (٢٠١٨)^(٣٨) who found that nurses with adequate knowledge of palliative care had higher mean age. Also, **Karkada et al** (٢٠١٢)^(٣٧) revealed a significant association between the age of the nurses and their knowledge about palliative care.

The current study revealed that, all nurses' total knowledge improved regardless educational level immediately and one

month after the educational program. This may be due to that, the structured educational program met nurses' educational needs. **Ayed et al** (٢٠١٥)^(٣٣) was in the same line of the current study and found that there was no significant correlation between knowledge scores about palliative care and academic level of nurses.

Moreover, the present study revealed that there was positive correlation between nurses' knowledge and their years of experience before implementing the educational program. This may be attributed to the fact that, older nurses with more years of experience exposed to different situations in hematology and oncology units which subsequently improved their knowledge. These finding was in accordance with **Morsy** (٢٠١٤)^(٤٥) who found that knowledge of palliative care was influenced by years of nursing experience.

This finding wasn't in agreement with **Prem et al** (٢٠١٢)^(٣٧) who found that, no significant statistical correlations between palliative care total knowledge scores and nurses' years of experience.^(٣٧) **Ayed et al**

(٢٠١٥)^(٣٣) found that there were no significant correlation between knowledge scores and professional experience.

In addition, there was positive correlation between scores of total nurses' competency and their age before, immediately and one month after program implementation. This may be explained by, increasing nurses' age, exposure to different situations and cases may positively affect their practice and competency. **Thomas** (٢٠١٢)^(٤٦) wasn't in the same line with the present study and reported that, no significant association was found between competencies scores of studied nurses regarding palliative care and their age.

The current study revealed that, there was positive correlation between scores of total nurses' competency and their years of experience. On the same line was **Morsy et al** (٢٠١٤)^(٤٥) mentioned that, total performance of health care providers was associated with increase in nurses' years of experience. Also, **Fahim et al**(٢٠١٤)^(٤٧) agreed with this result and found that there was a significant statistical relation between

years of experience and total mean practices scores.

The current study revealed that there were significant positive correlations between all palliative care competency domains and each others before, immediately and after one month of the program. **El-Nagar et al** (٢٠١٣)^(٣٠) agreed with this finding as she reported that, the nurses should apply all competency items and domains for better outcomes.

The current study revealed that there was positive correlation between total nurses' knowledge and their competency. This may be due to the fact the successive educational sessions using different educational strategies and continuous evaluation improving nurses' knowledge and competencies. Additionally, palliative care education helps nurses felt comfortable in providing care to dying children and their families. This finding was consistent with the findings of **Sorifa et al** (٢٠١٥)^(٣٨) who indicated that there was a positive correlation between knowledge and competency scores of palliative care by nursing staff.

Conclusion and Recommendations

Based on the results of the present study, it can be concluded that there was a significant improvement in nurses' knowledge and competencies after the implementation of the educational program in relation to palliative care for children with advanced stage of cancer than before implementing it. There was a positive correlation between the total knowledge scores among the studied nurses and the total competency scores of nursing intervention for children with advanced stage of cancer.

Recommendations:

The following recommendations are suggested:

For nursing practice:

١. Designing a procedure handout about palliative care for nurses caring of children with advanced stage of cancer.
٢. Continuous in-service training program should be conducted periodically in order to

update nurses' knowledge and improve their competencies levels regarding pediatric palliative care.

For nursing education:

١. Pediatric palliative care must be incorporated into undergraduate and postgraduate nursing education curriculum.
٢. Conducting regular conferences and workshops to update nurses' knowledge and competencies related to palliative care.

For future nursing researches:

١. Application of the current study on a larger sample to improve generalizability.
٢. Application of competency based nursing intervention to children with advanced cancer.
٣. Developing an educational program for parents to promote spiritual wellbeing and coping with childhood cancer.
٤. Developing a clinical pathway of palliative care for nurses to provide high quality nursing care for children with advanced cancer.

References

١. National Cancer Institute: What Is Cancer. ٢٠١٥. Available at: <http://www.cancer.gov/news-events/press-releases/٢٠١٥/report-nation-march-press-release>.
٢. World Health Organization. Definition of Cancer. ٢٠١٧. Available at : www.who.int/cancer/en.
٣. Siegel R, Miller K, Fuchs H. Childhood cancer statistics in the United States. Am. Clin . J. ٢٠٢١;٧١(١):٧-٣٣.
٤. National Cancer Registry Program of Egypt. ٢٠١٧. Available at: <http://cancerregistry.gov.eg/>.
٥. Buffler S, Kwan P, Reynolds F, Urayama G. Environmental and genetic causes for childhood leukemia. Cancer Investig . J. ٢٠١٥; ٢٣ (١):٦٠-٧٥.
٦. National Cancer Institute. A Snapshot of Pediatric Cancers. ٢٠١٥. Available At:<http://www.cancer.gov/aboutnci/servingpeople/snapshots/pediatric.pdf>.
٧. Evans A. Pediatric cancer treatment. Pediatr.Oncol. J. ٢٠١٩;١٢(٧):٨٦١-٩٥.
٨. Beutler A. Policy Statement on Defining Palliative Care. ٢٠١٥. Available at:<http://www.thewhpc.org/resources/item/defining-palliative-care>
٩. Hulman L, Mpunga T, Tapela N, Wagner M, Fadelu T, Binagwaho A. Pediatric palliative medicine in the United Kingdom. Pediatr. Dis.J. ٢٠١٧; ٩٧(٤):٣-٨١.
١٠. Wolfe J, Hinds P, Sourkes B. Textbook of Interdisciplinary Pediatric Palliative Care. ٤thed. Philadelphia: Elsevier Co., ٢٠١٦; ٥(٥٦) :٤٧-٦٣.
١١. National Consensus Project for Quality Palliative Care. Clinical Practice Guidelines for Quality Palliative Care. ٢٠١٥. Available at <http://www.nationalconsensusproject.org>.
١٢. Oncology Nursing Society. Oncology Nurse Navigator Core Competencies. ٢٠١٥. Available at:https://www.ons.org/sites/default/files/ONNCompetencies_rev.pdf.
١٣. Goldman J, Freeth D, Zwarenstein M. Interprofessional education. Cochrane Database System Review. ٢٠١٦; ٣٤(٩):٢٢-٣٣.
١٤. Habibzadeh H, Khajeali N, Khalkhali R, Mohammad Y. Effect of evidence-based education on nursing

- Students' self-efficacy. Med . Edu. Dev .J. ٢٠١٥;١١(٤):٥٠٠-١٧.
١٥. David J, Fillion L. Development in palliative care to enhance nursing competence. Adv .Nurs. J. ٢٠١٥; ٦٨(٩):١٣-٢٤.
١٦. Brazil K, Brink P, Kaasalainen S, Kelly M, Ainey C. Knowledge and perceived competence among nurses caring for the dying in long-term care homes. Int. Palliat. Nurs. J. ٢٠١٢; ١٨(٢): ٧٧-٨٣.
١٧. National Cancer Institute. Dictionary of Cancer Terms. ٢٠١٥. Availableat:http://www.cancer.gov/template/s/db_alpha.aspx?expand=
١٨. World Health Organization .Definition of Palliative Care. ٢٠١٧. Availableat<http://www.who.int/cancer/palliative/definition/en>.
١٩. Ryan K, Connolly M, Charnely K, Ainscough A. Palliative care competence framework. Eur.Nurs. Midwifery.J. ٢٠١٤;٧٩ (٩):١٥-١٧.
٢٠. Meretoja R, Isoaho H, Leino H . Nurse competence scale: development and psychometric testing. Adv. Nurs.J. ٢٠١٣;١٤(١٠):٦١٧٣-٨٠.
٢١. Beth D, Robert G. Reading the Medical Literature: Basic& Clinical Biostatistics. ٥th ed. New York: McGraw-Hill Co.,٢٠١٩; ١٦١-٢١٨.
٢٢. World cancer research fund International. Childhood Cancer. (٢٠١٥). available at :<http://www.wcrf.org/int/cancer-facts-figures/worldwide-data>.
٢٣. Canadian Virtual Hospice. What Is Palliative Care. ٢٠١٥. available at :<http://www.virtualhospice.ca/en>.
٢٤. Morton P, Fontaine D. Essentials of Critical Care Nursing a Holistic Approach. ١٠th ed. London: Elsevier Co., ٢٠١٣; ٤١(٧٦):٣٧-٤٥.
٢٥. Dedeli O, Daban U, Pakyuz S. Nurses' attitudes towards patients with cancer. Int. Nurs. Sci. J. ٢٠١٦; ٦ (٧):١-٦.
٢٦. Al Qadire M. Knowledge and practice of palliative care. Jordan .Nurs.Edu.J. ٢٠١٣; ٦٥(٨):٢-٥٤.
٢٧. Karkada S, Nayak B, Malathi A. Awareness of palliative care among diploma nursing students. Indian .Palliat. Care .J. ٢٠١٢; ٧ (٥):٢٠-٢٣.
٢٨. Soubam C, Shantibala K, Akojiam B, Pulu J. Knowledge of palliative care

- among nurses in a tertiary hospital. IOSR - JDMS. ٢٠١٨ ; ١٧(١٢):٥٣-٨٧.
٢٩. Bahza N. Developing nursing care standard . IOSR -JDMS. ٢٠١٣; ٦٥(٨٧):٥٨-٧٩.
 ٣٠. El-Nagar S, Lawend J. Impact of palliative care education on nurses' knowledge, attitude and competence regarding care of chronically ill children. Palliat. Care .J. ٢٠١٣; ١٢(٧):٥٨-٩١.
 ٣١. Mahmoud M. Impact of an educational program in improving nurses performance among restrained children. Adv. Nurs. J . ٢٠١٤; ٦٥(١٠):٤-١٦.
 ٣٢. Prem V, Karvannan H, Kumar S, Karthikbabu S, Syed N, Sisodia V , Jaykumar S. Study of nurses' knowledge about palliative care. Indian Palliat. Care.J. ٢٠١٢; ١٨(٢): ١٢٢-٢٧.
 ٣٣. Ayed A, Sayej S, Harazneh L, Fashafsheh I , Eqtait F. Nurses' knowledge and attitudes towards the palliative care. Edu. Pract. J. ٢٠١٥ ; ٦ (٤): ٢٢٢-٤٢.
 ٣٤. Pfister D, Markett S, Muller M, Muller S, Grutzner F, Rolke R, Kern M, Schmidt-Wolf G, Radbruch L. German nursing home professionals' knowledge and specific self-efficacy related to palliative care. Ger. Health . J. ٢٠١٣; ٥(٨٧):٣٢-٤٥.
 ٣٥. Fadare J, Obimakinde M, Olaogun D, Afolayan M, Olatunya O, Ogundipe K. Perception of nurses about palliative care. Med. Health Sci .J. ٢٠١٤; ٤(٥): ٧٢٣-٧٢.
 ٣٦. Chover E, Martínez A, Lapeña Y. Knowledge in palliative care of nursing professionals. Ital. Nurs. Sci. J. ٢٠١٧; ٢٥(٢٠):٨٧-٩٨.
 ٣٧. Saylor J, Vernoooy S, Selekmán J, Cowperthwait A. Inter professional education using a palliative care simulation. NurS. Edu. J. ٢٠١٦; ٤١(٣): ١٢٥-٢٩.
 ٣٨. Sorifa B, Mosphea K. Knowledge and practice of staff nurses on palliative care. Int. Health Res. J. ٢٠١٥; ١(٢):٢٥-٤٣.
 ٣٩. Brazil K, Brink P, Kaasalainen S, Kelly M, Ainey C. Knowledge and perceived competence among nurses caring for the dying in long-term care homes. Int. Palliat. Nurs. J. ٢٠١٢; ١٨(٢): ٧٧-٨٣.
 ٤٠. Young Y, Min K, Kyoung L. Development and evaluation of an education program for professional

- palliative care nursing. Academic .Nurs . J .٢٠١٥; ٤٥(١): ١٣٩-٤٥.
٤١. Joy Y. The influence of a palliative care education intervention in increasing knowledge and self- efficacy of nurses practicing in long-term care. Hos.Care.J.٢٠١٥;٧٦(٨):٦٥-٩٨. .
 ٤٢. Kim S, Kim H, Yu J, Kim S, Park H, Choi S, Jung Y. The effect of an end-of-life nursing education course on nurses' knowledge of hospice and palliative care in Korea. Hos .Palliat. Nurs.J. ٢٠١٢; ١٣(٤): ٢٢٢-٣٩.
 ٤٣. Antench S, Kassa H, Demeke T, Guadu T. Assessment of nurses' knowledge, attitude, practice and associated factors towards palliative care. Am. Crit. Care.j. ٢٠١٦;١٠(٢):١١٠-٢٣.
 ٤٤. Abbaszadeh A, Sabeghi H, Heidary A, Borhani F. Assessment of the effect of continuing education program on nurse's knowledge, attitude and performance about palliative care. Evid. Based Care.j. ٢٠١٢; ٢ (٧): ٥-٨٣.
 ٤٥. Morsy W, Elfeky H, Mohammed S. Nurses' knowledge and practices about palliative care among cancer patient. Adv .Sci. Technol. J. ٢٠١٤; ٢٤ (٢):٢٣٥.
 ٤٦. Thomas S, Bausewein C, Higginson I, Booth S. Breathlessness in cancer patients. Eur. Oncol. Nurs.j. ٢٠١٢; ١٥(٥٦):٤٥٩-٦٩.
 ٤٧. Fahim D, Tatsui C, Suki D, Gumin J, Lang F and Rhines L. Model of primary malignant bone tumors. Neurosurg . J. ٢٠١٤;٢٧(٨): ٣٧٨-٨٥.