Effectiveness of Tailored Education Program on pregnant women's Knowledge and Practices regarding Hyperemesis Gravidarum and on its Severity

Fatma Kamal Ali [1], Mai Mahmoud Hassan [2] and Ola Abdel-Wahab Afifi [3]

1.2.3 lecturer of Obstetrics & Gynecological Nursing, Faculty of Nursing, Benha University, Egypt

Abstract

Background: Hyperemesis gravidarum is often defined as intractable nausea and vomiting during pregnancy. Hyperemesis gravidarum is severe enough to affect the general condition of the pregnant women and may require hospitalization. **Aim:** The research aimed to investigate the effectiveness of tailored education program on pregnant women's knowledge and practices regarding hyperemesis gravidarum and on its severity**. Design:** A quasi-experimental research (one group pre/post-test) design was adopted to fulfil the research aim. **Setting:** the research was conducted at Obstetrics and Gynecology Department (high-risk pregnancy ward) and at antenatal outpatient clinics at three hospitals (Benha University Hospitals, Benha Teaching Hospital and Benha Health Insurance Hospital). **Sample:** A purposive sample of 120 pregnant women. **Tools:** Four tools were used for data collection; a structured interviewing questionnaire, women' knowledge assessment sheet, women' health practices assessment sheet and Modified 24-hour Pregnancy-Unique Quantification of Emesis questionnaire. **Results:** showed a highly statistically significant improvement concerning pregnant women's knowledge and healthy practices regarding hyperemesis gravidarum at post-intervention phase compared to pre- intervention phase ($P \leq 0.001$). There was a statistical significant reduction in the severity of hyperemesis gravidarum at post-intervention phase compared to pre-intervention phase ($p \leq 0.05$). **Conclusion:** Tailored education program and its sessions had a positive effect on the improvement of pregnant women's knowledge and healthy practices regarding hyperemesis gravidarum during pregnancy. Furthermore, there was a statistical significant reduction in the severity of hyperemesis gravidarum after applying tailored education program. **Recommendations**: Dissemination of the current research tailored education program to all antenatal clinics, high risk pregnancy units and maternity hospitals at Benha city.

Keywords: Tailored Education Program, Knowledge, Practices, Hyperemesis Gravidarum, Severity

Introduction

Nausea and vomiting are common experiences in pregnancy, affecting 75–80% of all pregnant women, which usually, starts between first and second missed menstrual period and can continue up to 14-16 weeks of pregnancy **(El tamamy et al, 2019).** Emesis gravidarum is the term for mild cases, which have no pathological importance and don't interfere with a woman's normal activities. **(Koren et al, 2018).**

Hyperemesis Gravidarum (HG) is often defined as extreme, persistent nausea and vomiting during pregnancy. HG is severe enough to affect the general condition of the pregnant women and may require hospitalization. The definition of HG that is most frequently used is a severe case of nausea and vomiting accompanied by weight loss of more than 5% of pre-pregnancy body weight with dehydration, acidosis from starvation, alkalosis from loss of hydrochloric acid, hypokalemia, ketosis, acetonuria, and ptyalism. HG is a more serious and persistent emesis that interferes with nutrition and fluid intake **(Ng et al, 2018).**

Hyperemesis gravidarum affects approximately 0.3% to 3.6% of pregnancies **(Gupta et al, 2020).** About 80% of women lose weight, use medications, and have HG

each pregnancy, whereas 67% receive intravenous treatment and only 39% are hospitalized. Although women deliberately manage their symptoms to avoid the painful hospital experience, recurrence rates still surpass 70%. **(Fejzo et al, 2018).** About 30.0% of the women indicated that the symptoms were the same or worse in subsequent pregnancies, 26% said that symptoms were worse, and 44% reported better pregnancies **(Colodro-Conde et al, 2019).**

Hyperemesis gravidarum disappears by mid pregnancy among half of women, however in nearly 22% of cases it continues until birth. HG normally begins between 4 and 6 weeks into pregnancy, peaks between 10 and 13 weeks, and then subsides. Most women have all-day nausea, which contributes to debility and malnutrition due to its severity and poor treatment response. Emesis may be episodic and triggered by stimuli such as motion, smells, or the thought of food **(MacGibbon, et al., 2018).**

Hyperemesis gravidarum is a multifactorial disease; however, the etiology of HG is uncertain. A variety of mechanisms may play a role in this disease, such as endocrine factors like estradiol, human chorionic gonadotropin, progesterone, immunologic factors psychological factor. In addition, personal factors as increase body weight has been considered as possible underlying cause **(Beyazit et al, 2017).**

Risk factors for HG include younger age, first pregnancy, multiple gestation, extreme low or high body weight, allergies, history of motion sickness, thyroid disease, premenstrual syndrome, migraines, vegetarian/lactose- free diet, and gastrointestinal disorders **(Tian et al, 2017).** Incidence increases slightly among women with higher body mass index, in those who smoke tobacco, if mothers are carrying a female child or child who has Down syndrome, a previous HG pregnancy or a family member with HG, **(Dinberu et al, 2019).**

Hyperemesis gravidarum is diagnosed clinically after the prohibition of other causes such as hyperthyroidism, gastrointestinal disorders, underlying chronic illness, psychological and rarely, hereditary diseases. HG can be diagnosed when there is prolonged nausea and vomiting of pregnancy with the triad of dehydration, more than 5% weight loss than pre pregnancy state, and electrolyte imbalance which can be confirmed by laboratory investigation **(American pregnancy Association, 2020).**

Hyperemesis gravidarum has serious adverse effects on nearly every aspect of a woman's life. Women with severe HG may experience pneumothorax, retinal damage, gallbladder and liver dysfunction, esophageal tears, sepsis, organ rupture or failure, hematemesis, depression, fainting, anxiety and suicide **(Dayangan, 2018).** Women are also more likely to report postpartum issues, such as motion sickness, trauma, muscle weakness, prolonged immobility may result in severe muscle atrophy, depression and anxiety **(Fabian et al, 2018).** Also, fetal complications caused by HG include intrauterine growth restriction, premature birth, low birth weight, severe colic or irritability, autism, sensory processing disorders, neurodevelopmental disorders, sleep difficulties, and social delays **(Fejzo et al, 2019).**

The management of HG depends on the severity of the symptoms. Management ranged from use of oral anti-emetics, emotional support, as well as dietary modification, to more aggressive prompt treatment to correct electrolyte imbalances by hospitalization **(Heitmann, 2019).** Treatment of HG requires a combination of medical interventions, patient

education, adjunctive care, lifestyle changes, and dietary changes. Termination of pregnancy should be considered after all treatment attempts have failed which have been tried for a wanted pregnancy **(Gupta et al, 2020).**

Nurses play very pivotal role in providing pregnant women health education regarding HG to promote women's knowledge and practices to overcome this problem. Also, nurses should instruct the women to seek early treatment because delayed treatment and dismissed symptoms may lead to refractory symptoms and an increased risk of complications. Increasingly, nurses should provide emotional and psychological support for women suffering from HG by listening to her symptoms and complain. In extreme cases, the nurses should refer woman to obstetrics specialist **(Dean et al, 2018).**

Significance of the study

Hyperemesis gravidarum is a serious pregnancy ailment that can be quite debilitating and potentially life-threatening pregnancy disease. Globally, severe NVP or HG, reportedly affects 0.5% to 14% of women across all ethnicities and socioeconomic levels. Whereas in Egypt, there was high prevalence of HG which was 4.5% in relation to the universal prevalence **(Mahmoud, 2017).** There is no accurate way to measure the incidence of NVP and HG, as the criteria for diagnosing these conditions are not always consistent. However, based on research, it is estimated that 18% of women take antiemetic for these symptoms. **(MacGibbon, 2020).** Additionally, some women choose to end treatment before diagnosis or hospitalization. HG is the major cause of hospitalization in early pregnancy and second only to premature labor as the most common cause of hospitalization throughout all of pregnancy **(Trovik and Vikanes, 2019).**

Therefore, upgrading pregnant women's knowledge is necessary and mandatory to be safe and feel comfort. The researchers hope that the results of this study will lead to a change in the severity of hyperemesis gravidarum, as well as raise women's awareness and healthy practices regarding hyperemesis gravidarum.

Aim of the research

The aim was to investigate the effectiveness of tailored education program on pregnant women's knowledge and practices regarding hyperemesis gravidarum and on its severity. This aim was achieved through the following objectives:

- Assessing pregnant women's knowledge and healthy practices regarding hyperemesis gravidarum during pregnancy and assessing the severity of hyperemesis gravidarum.
- Designing and implementing tailored education program and session's framework for pregnant women regarding hyperemesis gravidarum during pregnancy.
- Evaluating the effect of tailored education program and educational sessions on pregnant women's knowledge and healthy practices regarding hyperemesis gravidarum and on the severity of it.

Research hypotheses:

- H1- Pregnant women will exhibit higher knowledge score regarding hyperemesis gravidarum after implementation of tailored education program .
- H2- Pregnant women will exhibit higher satisfactory level of healthy practices regarding hyperemesis gravidarum after implementation of tailored education program .

- H3- Pregnant women will exhibit decrease severity of hyperemesis gravidarum after implementation of tailored education program

Operational definitions:

Effectiveness: Refers to the desired outcome of tailored education program on knowledge and practices of pregnant women regarding hyperemesis gravidarum.

Tailored Education Program: a systematically developed programme, in which pregnant women with hyperemesis gravidarum engage in collaborative cycles of learning to develop their knowledge and practices regarding hyperemesis gravidarum.

Knowledge: It is the correct responses given by pregnant women on hyperemesis gravidarum and which can be assessed through knowledge assessment sheet.

Practices: activities that are performed repeatedly and regularly by pregnant women in order to reduce the severity of hyperemesis gravidarum.

Hyperemesis Gravidarum: extreme, persistent nausea and vomiting during pregnancy. It can cause dehydration, weight loss, and electrolyte imbalances. Also, it has negative consequences on daily activities and psychosocial burden of the pregnant women.

Subjects and method

Research design:

A quasi-experimental design (one group pre-test/post-test) was utilized to fulfill the aim of this research. A quasi-experiment is an empirical interventional study that does not involve randomization and is used to determine the causal influence of an intervention on the target population. Although quasi-experimental research resembles typical experimental design or randomized controlled trials, it does not include the aspect of random assignment to treatment or control **(Iowa State University of Science and Technology, 2020).** The dependent variable is measured twice in a pretest-posttest design: once before and once after the intervention. **(Posternak and Miller, 2001; Spurlock, 2018).**

Research setting:

This research was conducted at Obstetrics and Gynecology Department (high-risk pregnancy wards) and at antenatal outpatient clinics at three hospitals due to the relative rarity of cases, which were Benha University hospitals, Benha Teaching Hospital and Benha Health Insurance Hospital. These hospitals located in Benha City at Qalioubia Governorate. These particular settings were chosen because they are main hospitals providing care for women with different social backgrounds and covers a wide geographical area of Benha city and Qaliubya Governorate. Also they are clinical training settings for nursing students from the Faculty of Nursing, Technical Nursing Institute and High School of Nursing. These hospitals provide free and economical service to all patients including high risk pregnancy cases. The hospitals receive large numbers of women each month who seek care for follow up during pregnancy from different areas (urban & rural area).

Sample:

Sample type: A Purposive sample was selected from the above-mentioned research settings.

Sample size: Due to the relative rarity of the disease, the sample was collected among those who attended the previously three mentioned settings, for 12 months (which was (120) pregnant women obtained as following: 67 from Benha University Hospitals, 31 from

Benha Teaching Hospital and 22 from Benha Health Insurance Hospital).

Inclusion criteria:

Inclusion criteria were applied as: women's age ≥ 18 years, had desire to participate in the research, available during the time of the research and confirmedly diagnosed by HG (Diagnostic criteria of HG: vomiting 3 episodes per day, weight loss exceeding 5% of the pre-pregnancy weight; and/or ketones on a urine analysis; and/or dehydration and/or an electrolyte imbalance).

Tools for data collection:

After reviewing related literature, the four major tools were designed.

Tool I: A Structured Interviewing Questionnaire:

The researchers designed it after reviewing the related literature **(American pregnancy Association, 2020; Dinberu et al, 2019; Gabra, 2019)** then translated into Arabic language. It included four parts:

Part 1: Studied women's personal characteristics which consisted of age, place of residence, educational level, occupation, income, Body Mass Index (BMI) and information sources. Body mass index calculated as following :

BMI = Weight (kg)/height² (m) according to **WHO, (2021)** BMI Categories :

- Underweight = <18.5
- Normal weight = 18.5–24.9
- Overweight = 25–29.9
- Obesity = ≥ 30

Part 2: Included the obstetrical history of studied women. It consisted of gravida, previous abortion, current gestational age in weeks, routine investigations and other warning signs during current pregnancy.

Part 3: Included the risk factors that aggravate hyperemesis gravidarum, which consisted of first-time pregnancy, multiple pregnancy, liver or stomach disease, history of hyperemesis gravidarum in previous pregnancies, family history of hyperemesis gravidarum in the mother or sister, obesity, pregnancy induced hypertension (PIH) and psychological upset.

Part 4: Included negative consequences of hyperemesis gravidarum on daily activities (feeling depressed, anxiety, guilt and loss of self, reduced quality of life, thoughts of suicide or elective pregnancy termination, considering future pregnancies after HG pregnancy and general well-being) and psychosocial burden (Performing domestic duties, Social life, Relationship with partner, Ability to care for children and Capacity for work and study).

Tool II: Women' Knowledge Assessment Sheet: (pre- posttest):

It was used to assess women's knowledge regarding hyperemesis gravidarum. The researchers designed the knowledge assessment sheet in the Arabic language after reviewing related literature as: **(Smith et al, 2020; Farg and Hassan, 2019; Luqmanasari, 2018)**. It consisted of 22-multiple-choice questions. Each question has three possible responses (one right answer, one wrong answers, and I do not know).

Scoring system:

Each question given a score of (1) for a correct response and a score of (0) for an incorrect or unknowing response. Women's cumulative scores represent their understanding of hyperemesis gravidarum. The possible total knowledge score varied from 0 to 22 and was categorized as good when it was ≥75% to 100% (17-22), average when it was 50-<75% (11-16), and poor when it was <50% (0-<10).

Tool III: Women' Healthy Practices Assessment Sheet: (pre- posttest): It was designed by the researchers after reviewing related literature **(Smith et al, 2020; Havnen, et al., 2019; Bej, 2018)** and was translated into Arabic language. It had 20 questions that were intended to evaluate the women's reported health practices that might reduce the severity of hyperemesis gravidarum during pregnancy.

Scoring System:

Each healthy practice was given a score (2) if it was always practiced, a score (1) if it was practiced occasionally or sometimes, and a score (zero) if it was never practiced. The total practices score was calculated by adding the item-by-item scores. Women's total practice scores were assessed on a scale of 0 to 40 with a score of 0 to 23 (< 60%) representing unsatisfactory practice and a score of 24-40 (≥ 60%) representing satisfactory practice.

Tool IV: Modified 24-hour Pregnancy-Unique Quantification of Emesis (PUQE) questionnaire: (pre-posttest)

It was adapted from **(Gupta et al, 2020; Ebrahimi et al, 2009; Koren et al, 2002).** It is a valid and unbiased index which used to measure pregnancy-related nausea and vomiting symptoms (NVP). The PUQE scale was developed by Motherisk. The Pregnancy-Unique Quantification of Emesis (PUQE) score are often used to assess and classifies the severity of NVP and classify the women into three groups based on the severity of their symptoms. It consists of three points; the total number of hours of nausea, the total number of episodes of retching, and the total number of episodes of vomiting within the last 24 hours. Each item receives a score between 1 and 5. The values are added to determine the PUQE score, which can range from 3 to 15 points. A score of ≤ 6 points is classified as mild NVP, 7-12 points as moderate and a score ≥ 13 as severe.

Administrative approval:

The directors of the aforementioned three hospitals were given written official approval to conduct the study by the dean of the nursing faculty, which was then given to the directors of the obstetrics and gynecology department (high-risk pregnancy unit) in order to get their consent to conduct the study.

Validity and reliability of the tools:

A panel of three jury experts in the field of obstetrics and gynecological nursing at Benha University evaluated the validity of questionnaires to ensure the clarity, relevance, comprehensiveness, and applicability of tools. Minor modifications were required in formulating sentences. The reliability was done by Cronbach's Alpha coefficient test, which showed that the women' knowledge assessment sheet internal consistency was 0.82, the internal consistency of women' healthy practices assessment sheet was 0.85, and the internal consistency of the (PUQE) questionnaire was 0.87.

Ethical consideration:

Approval of the Faculty ethics committee for scientific research was obtained for the fulfillment of the study. An official permission from the selected study settings was obtained for the fulfillment of the study. At the beginning of the interview and throughout the study, each woman was informed of the purpose of the research in order to build her trust and gain her confidence. The researchers obtained informed consent from women to participate in the study. Self-esteem, dignity and confidentiality of women was ensured throughout the study process, and no personal information was shared. In

addition, women were given the assurance that all data would be utilized solely for research purposes and that they could leave the study at any moment. The study also has no negative effects on physical, social or psychological risk on the participants.

Pilot study

To assess the simplicity, clarity, and application of the research tools as well as to determine how long it would take to complete each tool, a pilot study was conducted on ten percent of the overall duration of the data collection, or roughly 5 weeks (12 pregnant women). Women from the pilot study were included in study sample due to the fact that no changes have been made and the relative rarity of cases.

Field work:

Data were collected through the beginning of May 2021 and completed at the end of April 2022, covering twelve months. The researchers conducted the research three days/week (Saturdays, Mondays and Tuesdays); from 9.00 a.m. to 2.00 p.m. for each hospital which previously mentioned. As a result of collecting the sample from more than one hospital, the researchers divided themselves so that each researcher was responsible for collecting data from one hospital

This research was conducted through five sequential phases:

The preparatory phase: was the first phase of the research. A review of current and past national and international relevant literature related to hyperemesis gravidarum was carried out using local and international textbooks, journals, periodicals, and computer searches to construct the research tools and contents .

Interviewing and assessment phase: In order to build trust and get the women's cooperation, the researchers greeted the women, introduced themselves, explained the reason for the study, and gave the women all the information about it (purpose, duration, and activities), and then obtained the informed written consent to participate in the research. Researchers gathered data by asking and interviewing the woman to complete a Structured Interviewing Questionnaire (tool I: to assess personal characteristics, obstetrical history, risk factors and negative consequences of H.G), Maternal Knowledge Questionnaire (tool II: to assess women's knowledge regarding H.G), Maternal healthy practices Questionnaire (tool III: to assess women's practices regarding H.G) and (PUQE) questionnaire (tool IV: to assess the severity of H.G). The average time required for completion of the questionnaires was around (35-45 minutes). The information gathered during this phase served as the baseline for subsequent comparisons to assess the impact of the tailored education program.

Planning phase: Based on results obtained during assessment phase, the educational booklet was developed by the researchers after reviewing related literature. The tailored education program was designed specifically for women, in simple Arabic language to suit their level of understanding and to satisfy the studied pregnant women's deficit knowledge and healthy practices regarding H.G. It had been illustrated by colored pictures and in a comprehensive manner. Sessions number and its contents, different methods of teaching, and instructional material were decided upon. Objectives were constructed to be attained after completion of health educational sessions. The general objective was: by the end of the health educational sessions, each

woman would be able to acquire essential knowledge and have healthy practices regarding H.G.

Implementation phase: Implementation of the health educational sessions was carried out at the pre-mentioned setting. Times of session was determined according to women's physical and mental readiness. The overall sessions were three sessions for each woman; with a duration ranged from 45-60 minutes, included periods of discussion according to women's achievement, progress, and feedback .

Different methods of teaching were used such as lectures, group discussions, demonstration, re-demonstration, critical thinking and problem solving and brainstorming. Instructional media included video contain all content of the sessions. To reach the research's goals, the instructional booklet was given to every woman who signed up for the study after the first session. Moreover, the researchers had used supportive tools that function as stimulus control to support desired changes include stickers and flyers that reinforce the concepts of the intervention and emphasizing the effects of the tailored education program on women's knowledge and healthy practices and on the severity of H.G.

At the beginning of the first session women were oriented with the tailored education program contents. The subsequent session started by feedback about the previous session and the objectives of the new session. Simple Arabic language were used to suit women' level of understanding. At the end of each session, five minutes were devoted to permit women to ask questions to clarify the session contents and to correct any misunderstanding. Each woman was informed about the time of the next sessions.

The sessions were conducted in the following order:

The first session included: knowledge about (definition of hyperemesis gravidarum, difference between morning sickness and H.G., times of day at which H.G occurs, gestational age in weeks of at which H.G occurs, incidence, risk factors and causes, signs and symptoms, noticeable signs at clinical examination, biochemical changes, causes related to pregnancy, causes that not related to pregnancy).

The second session included: knowledge about (complications for mother, complications for fetus, diagnosis, investigation, prevention methods, healthcare modalities, observations in case of hospitalization, effective nutritional recommendations, alternative treatments, prohibited foods and cases of H.G in which doctor is forced to terminate a pregnancy).

The third session included: explanation and clarification of healthy practices that should be followed to alleviate the severity of H.G .

Evaluation phase: four (4) weeks after implementation of tailored education program, the researchers used the same previous (pretest) tools (a tool II, III and IV) as (Posttest) tools to evaluate the effect of tailored education program and instructional booklet on women's knowledge and healthy practices regarding H.G and on the severity of H.G. The researchers followed the discharged women from hospital via telephone.

Limitation of the Study

Occasionally, educational sessions had to be postponed because the women weren't mentally or physically prepared.

Statistical analysis:

Statistical Package for Social Science was used for data entry and statistical analysis (SPSS version 22). Descriptive statistics included frequencies and percentages, means, and standard deviations. The study hypotheses was tested using inferential statistics and the Chi-square test. The association between knowledge and practice scores was examined using the correlation coefficient. p-value > 0.05 indicated no statistically significant difference, p-value ≤0.05 indicated a statistically significant difference, and p-value P ≤ 0.001 indicated a highly statistically.

Results:

Table (1) shows personal characteristics of the studied sample. It was cleared that 58.3% of studied sample were in age group 18 - 23 years with a mean age of 23.02±7.57 years. 60.8% and 60.0% of the studied sample lived in rural areas and were housewives respectively. Regarding the educational level, 34.2% of studied sample had secondary education. Moreover, 58.3% of them had fairly sufficient income.

Figure (1) reveals that 11.7% of the studied sample were obese and 52.5% of them had overweight. While, 35.8% of them were normal body mass index.

Figure (2) displays that, 70.8% and 50.0% of studied sample took their information from family members and health-care personnel respectively, "Taking into consideration results not mutually exclusive".

Table (2) illustrates that, 56.7% of the studied sample were primigravida with a mean gestational age of (12.94±4.72) weeks. About 15.8% of them had previous abortion. Additionally, all of them 100.0% performed routine investigations for current pregnancy. Moreover, 11.7% suffering from other warning signs during current pregnancy.

Table (3) reveals that, the commonest risk factors that aggravate hyperemesis gravidarum among the studied sample were in order as follows: obesity, first time pregnancy, history of hyperemesis gravidarum in previous pregnancies, family history of hyperemesis gravidarum in the mother or sister and psychological upset. These factors account for 64.2%, 56.7%, 33.3%, 30.0% and 20.8% respectively. "Taking into consideration results not mutually exclusive".

Table (4) clears that, as regards Psychosocial burden, 70.8% of studied women had always feeling depressed, anxiety, guilt and loss of self, 90.0% of them had always reduced quality of life and more than half of them 58.3% and 55.0% always considering future pregnancies after HG pregnancy and had the worst general well-being respectively. In relation to daily activities, the majority of studied sample suffered major impact on performing household chores, social life, relationship with partner, ability to care for children and work and study capacity

Table (5) clears that there was a highly statistical significant difference between the results of post-intervention phase compared to pre- intervention phase in favor of post-intervention regarding all items of studied sample's knowledge about hyperemesis gravidarum with p≤0.001.

Figure (3) displays that, 10.0% and 68.4% of studied sample had good knowledge regarding hyperemesis gravidarum at pre-intervention and post-intervention phases respectively. While, it was revealed that 70.8% and 20.8% of studied sample had poor knowledge regarding hyperemesis gravidarum

at pre-intervention and post-intervention phases respectively.

Table (6) clears that there was a highly statistical significant difference between the results of post-intervention phase compared to pre- intervention phase in favor of post-intervention regarding all items of studied sample's healthy practices about hyperemesis gravidarum with p≤0.001.

Figure (4) displays that, 30.8% and 81.7% of studied sample had satisfactory level of healthy practices regarding hyperemesis gravidarum at pre-intervention and post-intervention phases respectively.

Table (7) illustrates that there was a statistical significant difference between the severities of hyperemesis gravidarum at post-intervention phase compared to pre-intervention phase in favor of post-intervention p≤ 0.05. This indicated an improvement in the severity of hyperemesis gravidarum.

Table (8) clarifies that; there was a non-significant positive correlation between total knowledge and total healthy practices regarding hyperemesis gravidarum at pre-intervention phase (P> 0.05). While, there was a highly positive statistical correlation between total knowledge and total healthy practices regarding hyperemesis gravidarum at post-intervention phase (P≤ 0.001).

Table (1) Distribution of the studied women according to their personal characteristics (n=120).

Personal characteristics	No	%
Age (year)		
18 - 23	70	58.3
24 - 29	24	20.0
30 - 35	13	10.8
>35	13	10.8
Mean ± SD	23.02±7.57	
Residence		
Urban	47	39.2
Rural	73	60.8
Level of education		
Illiterate	10	8.3
Primary education	16	13.3
Preparatory education	24	20.0
Secondary education	41	34.2
University education	29	24.2
Occupation		
Housewife	72	60.0
Employed	36	30.0
Students	12	10.0
Income		
Sufficient	14	11.7
Fairly sufficient	70	58.3
Not sufficient	36	30.0

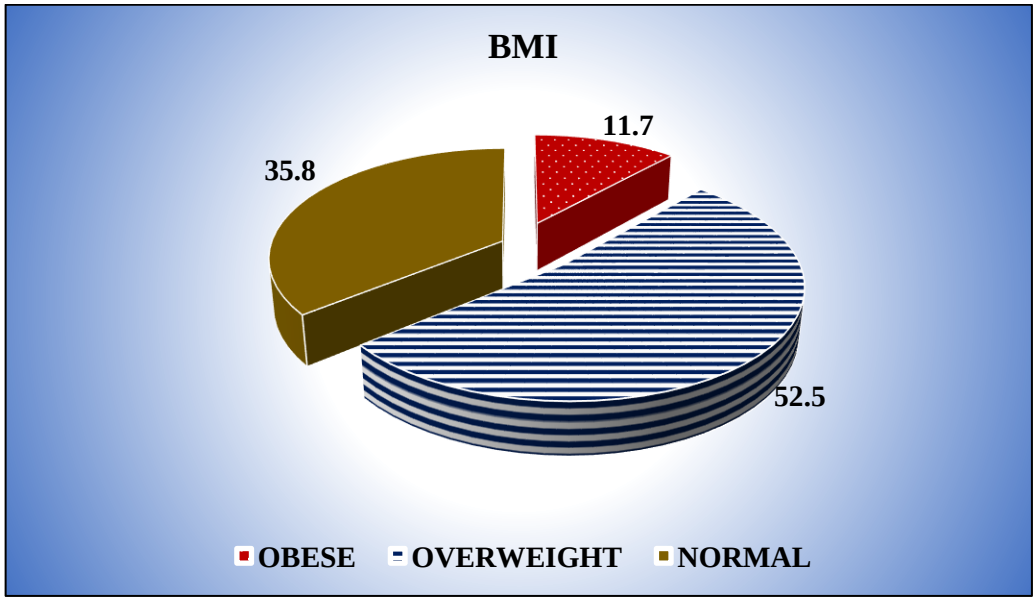
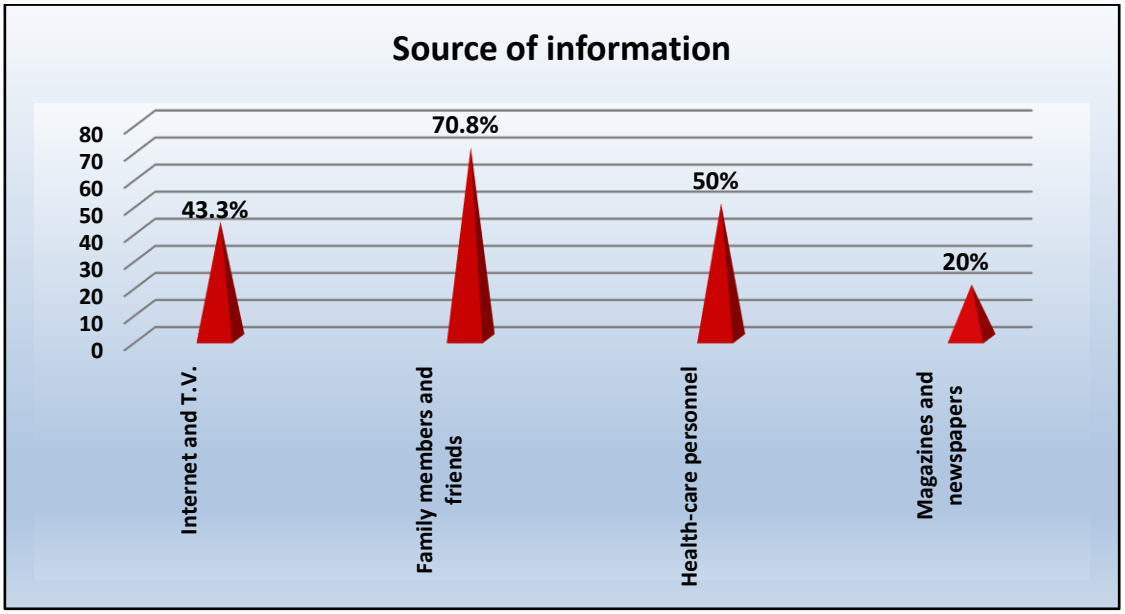


Figure (1): Percentage distribution of studied sample regarding their body mass index (n=120).



*** Results not mutually exclusive**

Figure (2): Percentage distribution of studied sample regarding their source of information about hyperemesis gravidarum (n=120).

Table (2): Distribution of the studied women regarding their obstetrical history (n=120).

Obstetrical history	No	%
Gravida		
Primigravida	68	56.7
2-3 times	37	30.8
≥4 times	15	12.5
Previous abortion	19	15.8
Current gestational age (weeks):		
Mean ± SD = 12.94±4.72		
Performing routine investigations for current pregnancy		
Yes	120	100.0
No	0	0.0
Presence of other warning signs during current pregnancy		
Yes	14	11.7
No	106	88.3
If yes, forms of warning signs (n=14)*		
Severe headache	8	57.1
Blurred vision	5	35.7
Abdominal pain	1	7.1
Bleeding	2	14.3

*** Results not mutually exclusive**

Table (3): Distribution of the studied women according to presence of risk factors that aggravate hyperemesis gravidarum (n=120).

Risk factors	No	%
First time pregnancy.	68	56.7
Multiple pregnancy	6	5.0
Having liver or stomach disease.	22	18.3
History of hyperemesis gravidarum in previous pregnancies.	40	33.3
Family history of hyperemesis gravidarum in the mother or sister	36	30.0
Obesity	77	64.2
Pregnancy induced hypertension (PIH)	8	6.7
Psychological upset	25	20.8

*** Results not mutually exclusive**

Table (4): Distribution of the studied women according to negative consequences of hyperemesis gravidarum on daily activities and psychosocial burden (n=120).

Psychosocial burden	No	%	Daily activities	No	%
Feeling depressed, anxiety, guilt and loss of self			**Performing household chores**		
Always	85	70.8	No impact	0	0.0
Sometimes	21	17.5	Minor impact	0	0.0
Never	14	11.7	Major impact	120	100.0
Reduced quality of life			**Social life**		
Always	108	90.0	No impact	0	0.0
Sometimes	12	10.0	Minor impact	0	0.0
Never	0	0.0	Major impact	120	100.0
Thoughts of suicide or elective			**Relationship with partner**		
Always	15	12.5	No impact	0	0.0
Sometimes	32	26.7	Minor impact	8	6.7
Never	73	60.8	Major impact	112	93.3
Considering future pregnancies after HG pregnancy			**Ability to care for children (n=52)**		
Always	70	58.3	No impact	0	0.0
Sometimes	34	28.3	Minor impact	11	9.2
Never	16	13.4	Major impact	109	90.8
General well-being			**Work and study capacity (n=48)**		
Always	66	55.0	No impact	0	0.0
Sometimes	45	37.5	Minor impact	5	4.2
Never	9	7.5	Major impact	115	95.8

Table (5): Distribution of studied sample regarding their knowledge about hyperemesis gravidarum at pre- intervention and post- intervention phases (n = 120).

Knowledge items	Pre-intervention				post-intervention				X^2	p-value
	Correct answer		Incorrect or don't know		Correct answer		Incorrect or don't know			
	No	%	No	%	No	%	No	%		
Definition of hyperemesis gravidarum	76	63.3	44	36.7	111	92.5	9	7.5	29.6	0.000**
The difference between normal morning sickness and hyperemesis gravidarum	38	31.7	82	68.3	98	81.7	22	18.3	61.0	0.000**
The times of day at which H.G occurs	75	62.5	45	37.5	112	93.3	8	6.7	33.1	0.000**
Gestational age in weeks of at which H.G occurs	29	24.2	91	75.8	87	72.5	33	27.5	56.1	0.000**
Risk factors and causes of H.G	39	32.5	81	67.5	113	94.2	7	5.8	98.3	0.000**
Signs and symptoms of H.G	42	35.0	78	65.0	112	93.3	8	6.7	88.7	0.000**
Biochemical changes that occur due to H.G	25	20.8	95	79.2	112	93.3	8	6.7	128.7	0.000**
Causes related to pregnancy and may lead to H.G	39	32.5	81	67.5	94	78.3	26	21.7	51.0	0.000**
Complications of H.G for the mother	69	57.5	51	42.5	108	90.0	12	10.0	32.7	0.000**
Complications of H.G for the fetus	31	25.8	89	74.2	111	92.5	9	7.5	110.3	0.000**
Diagnosis of H.G	53	44.2	67	55.8	112	93.3	8	6.7	67.5	0.000**
Investigation should be performed for a woman suffering from H.G	49	40.8	71	59.2	108	90.0	12	10.0	64.1	0.000**
Prevention methods of H.G	54	45.0	66	55.0	90	75.0	30	25.0	22.5	0.000**
Observations in case of hospitalization	31	25.8	89	74.2	111	92.5	9	7.5	110.3	0.000**
Effective nutritional recommendations in health care for H.G	42	35.0	78	65.0	107	89.2	13	10.8	74.7	0.000**
Alternative treatments used to reduce the frequency of vomiting	54	45.0	66	55.0	113	94.2	7	5.8	68.5	0.000**
Prohibited foods in case of H.G	29	24.2	91	75.8	87	72.5	33	27.5	56.1	0.000**
Cases of H.G in which doctor is forced to terminate a pregnancy	30	25.0	90	75.0	110	91.7	10	8.3	109.7	0.000**

**A Highly Statistical significant p ≤ 0.001

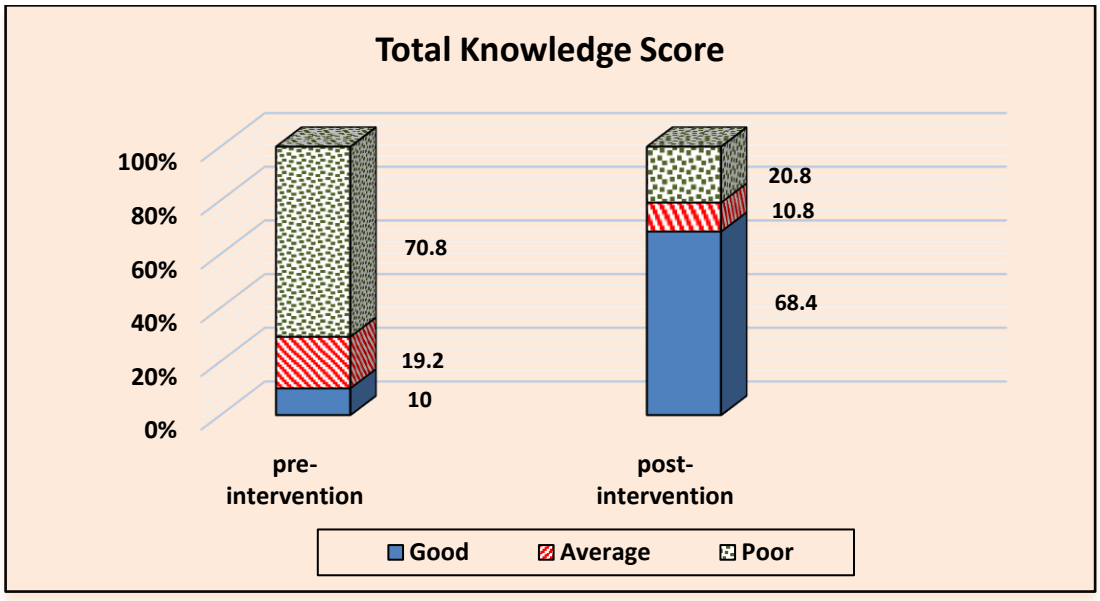


Figure (3): Percentage distribution of studied women regarding their total knowledge score about hyperemesis gravidarum at pre- intervention and post- intervention phases (n = 120).

Table (6): Distribution of studied women regarding reported healthy practices about hyperemesis gravidarum at pre- intervention and post- intervention phases (n = 120).

Healthy practices items	Pre-intervention						post-intervention						X2	p-value
	Always		Sometimes		Never		Always		Sometimes		Never			
	No	%	No	%	No	%	No	%	No	%	No	%		
Following the schedule of antenatal visits	48	40.0	72	60.0	0	0.0	79	65.8	41	34.2	0	0.0	16.0	0.000**
Taking nutritional supplements prescribed by a doctor.	35	29.2	59	49.2	26	21.7	80	66.7	26	21.7	14	11.7	34.0	0.000**
Taking the medicine at the prescribed time as recommended.	30	25.0	42	35.0	48	40.0	61	50.8	47	39.2	12	10.0	32.4	0.000**
Sleeping enough hours every day and sleeping early.	21	17.5	42	35.0	57	47.5	61	50.8	37	30.8	22	18.3	35.3	0.000**
Sleeping in a dark and quiet room to avoid sensory stimulation.	19	15.8	45	37.5	56	46.7	55	45.8	43	35.8	22	18.3	32.3	0.000**
Tracking the weight regularly.	18	15.0	43	35.8	59	49.2	61	50.8	37	30.8	22	18.3	40.7	0.000**
Getting a rest after eating for some time at least a quarter of an hour to help prevent stomach muscles from cramping	18	15.0	60	50.0	42	35.0	63	52.5	44	36.7	13	10.8	42.7	0.000**
Avoid using perfumes and stimuli.	14	11.7	38	31.7	68	56.7	60	50.0	29	24.2	31	25.8	43.6	0.000**
Eat small and frequent meals that are high in carbohydrates and low in protein in fat.	21	17.5	42	35.0	57	47.5	61	50.8	37	30.8	22	18.3	35.3	0.000**
Eat dry biscuits first when waking up in the morning before getting out of bed.	35	29.2	59	49.2	26	21.7	80	66.7	26	21.7	14	11.7	34.0	0.000**
Eat snacks before bed to reduce the urge to vomit.	28	23.3	63	52.5	29	24.2	78	65.0	31	25.8	11	9.2	42.5	0.000**
Eat bananas regularly to supply the body with mineral salts that help reduce nausea and vomiting.	28	23.3	39	32.5	53	44.2	70	58.3	21	17.5	29	24.2	30.4	0.000**
Drinking a glass of milk before bed.	22	18.3	47	39.2	51	42.5	68	56.7	27	22.5	25	20.8	37.8	0.000**
Drinking more fluids to prevent dehydration, at least 2 liters /day.	54	45.0	66	55.0	0	0.0	80	66.7	40	33.3	0	0.0	11.4	0.000**
Avoiding foods and odors that may trigger nausea or vomiting.	29	24.2	50	41.7	41	34.2	71	59.2	26	21.7	23	19.2	30.2	0.000**
Substituting some cold meals or cook in well-ventilated areas.	24	20.0	56	46.7	40	33.3	72	60.0	29	24.2	19	15.8	40.0	0.000**
Asking for help from family and friends to avoid cooking responsibilities when possible.	18	15.0	78	65.0	24	20.0	47	39.2	73	60.8	0	0.0	37.1	0.000**
Lie down when nausea is severe.	54	45.0	66	55.0	0	0.0	80	66.7	40	33.3	0	0.0	11.4	0.000**
Avoiding stress which can increase the presentation of their symptoms.	14	11.7	38	31.7	68	56.7	60	50.0	29	24.2	31	25.8	43.6	0.000**
Seeking psychological support during HG.	6	5.0	48	40.0	66	55.0	53	44.2	33	27.5	34	28.3	50.4	0.000**

****A Highly Statistical significant p ≤ 0.001**

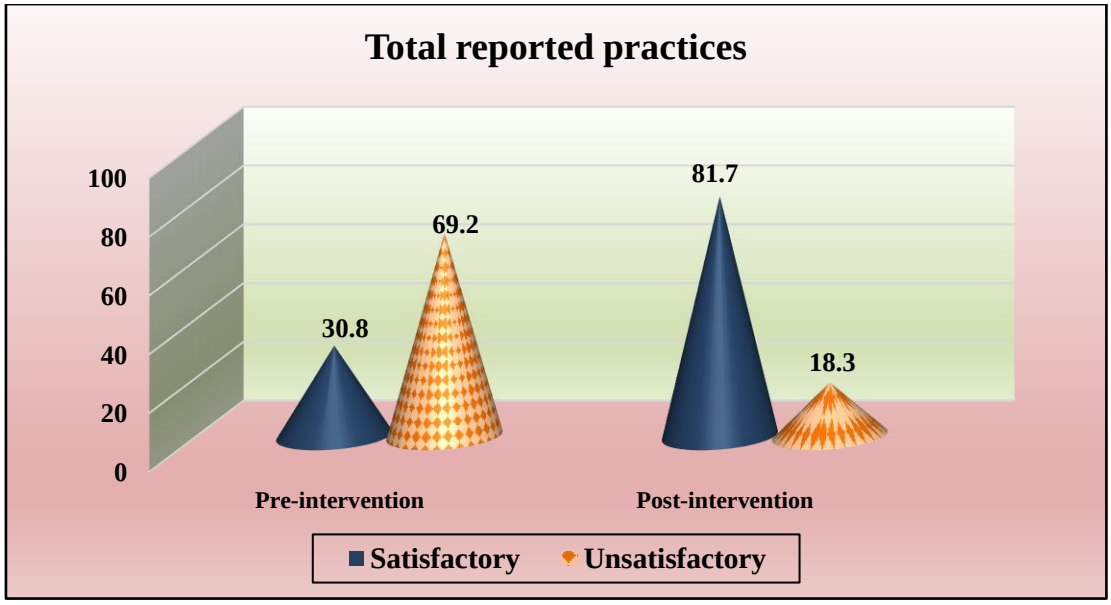


Figure (4): Percentage distribution of studied women regarding their total healthy practices score about hyperemesis gravidarum at pre-intervention and post- intervention phases (n = 120).

Table (7): Distribution of the studied sample regarding severity of hyperemesis gravidarum according to Pregnancy-Unique Quantification of Emesis (PUQE) index at pre-intervention and post- intervention phases (n = 120).

PUQE grade	Pre intervention		Post intervention		X^2	P-value
	No	%	No	%		
Mild	11	9.2	26	21.7	7.28	.026*
Moderate	72	60.0	64	53.3		
Severe	37	30.8	30	25.0		

***A Statistical significant p ≤ 0.05**

Table (8): Correlation between total knowledge and total healthy practices score of the studied sample regarding hyperemesis gravidarum at pre and post intervention phases (n = 120).

Variables	Total knowledge			
	Pre		post	
	r	P-value	r	P-value
Total healthy practices	0.128	0.163	0.747	0.000**

Discussion

Hyperemesis gravidarum is a debilitating and potentially life-threatening pregnancy disease marked by weight loss, malnutrition, and dehydration attributed to unrelenting nausea and/or vomiting; HG increases the danger of adverse outcomes for the mother and children. The complexity of HG affects every aspect of a woman's life during and after pregnancy **(Jenabi and Fereidooni, 2019).** Life-threatening complications may arise in the absence of meticulous intervention by qualified and proactive professionals. Understanding physical and mental stressors, being aware of potential risks and complications, and utilizing proactive assessment and treatment procedures while utilizing cutting-edge clinical technologies are all necessary for managing HG effectively. **(Dinberu et al, 2019).**

The current research aimed to investigate the effectiveness of tailored education program on pregnant women's knowledge and practices regarding hyperemesis gravidarum and on its severity. The findings of this research significantly supported the research hypothesis, which confirms the importance of utilizing the tailored education program and instructional booklet for improving women's knowledge and healthy practices regarding hyperemesis gravidarum during pregnancy and decreasing its severity .

Regarding the personal characteristics of the studied women, the present research results revealed that more than half of studied sample were in age group 18 - 23 years with a mean age of 23.02±7.57 years. As regards the residence, less than two-thirds of them lived in rural areas. Furthermore, less than two-thirds of them were housewives. Regarding the educational level, about one-third of them had secondary education. Moreover; more than half of them had fairly sufficient income. From the researchers' point of view, the young age of women and average of educational level may contribute to their lack of awareness of and poor coping mechanisms for hyperemesis gravidarum.

Concerning source of information, the majority of studied sample have information from family members and health-care personnel respectively. These results emphasized the significant role of a family member in affecting knowledge and practices of pregnant women positively or negatively. Therefore, through educational programmes, pregnant women should be equipped with the necessary knowledge and practices to correct misconceptions and knowledge that they may have picked up from others.

As regards body mass index, it was revealed in the current research results that slightly more than one-tenth of the studied sample were obese and more than half of them were overweight. This finding was confirmed by **Kosus et al, (2019),** who summarized that pre-pregnancy body mass index was correlated with the development of hyperemesis gravidarum and hence could be considered as predictive markers for HG.

In relation to obstetrical history the findings of present research illustrated that, more than half of the studied sample were primigravida with a mean gestational age of (12.94±4.72) weeks. About one-sixth of them had previous abortion. Additionally, all of them performed routine investigations for current pregnancy. Moreover, minority of them suffering from other warning signs during current pregnancy .

Additionally, the result of current research clarified that the commonest risk factors that aggravate hyperemesis gravidarum

among the studied women were in order as follows: obesity, first time pregnancy, history of hyperemesis gravidarum in previous pregnancies, family history of hyperemesis gravidarum in the mother or sister, and psychological upset. These factors account for about two thirds, more than half, one third, less than one-third and about one-fifth respectively. "Considering that results not mutually exclusive". These results correspond to **Mahmoud, (2017),** who showed that the most common risk factors of hyperemesis gravidarum were multiple pregnancy, previous hyperemesis gravidarum, gastrointestinal diseases and urinary tract infection.

The present research finding cleared negative consequences of hyperemesis gravidarum on daily activities and psychosocial burden, as regards Psychosocial burden, less than three quarters of studied sample had always feeling depressed, anxiety, guilt and loss of self, majority of them had always reduced quality of life and more than half of them always considering future pregnancies after HG pregnancy and had the worst general well-being. In relation to daily activities, the majority of studied sample suffered major impact on performing household chores, social life, relationship with partner, ability to care for children and work and study capacity. This result came in agreement with **Gabra, (2019),** who indicated that HG caused maternal and fetal consequences and pregnant women with HG may suffer marked psychosocial burden.

The findings of the current research agreed with **Heitmann et al, (2020),** who reported that more than one-fourth of women with severe NVP thought about termination the pregnancy because of NVP, and three quarters of them thought about not getting pregnant again. Global quality of life was still strongly correlated with NVP severity. More than four fifth illustrated that the NVP had greet adverse effects on the ability to care for their children, and more than two fifth illustrated major impact on the relationship with their partner, reflecting substantial effects on family life functioning. Most of studied women reported major impact on their work capacity and had been on sick leave due to NVP.

Moreover, the results of our research were also in the same harmony with **Havnen et al, (2019),** who reported that HG had a high psychosocial burden and major impact on daily activities and Participants described HG as having severe psychosocial consequences and profound impact on daily activities. Almost two out of five reported thoughts of elective abortion, and eight women had at least one elective pregnancy termination due to HG.

This proves the existence of close relationship between H.G. and the disturbance of daily life and psychological state of pregnant women and also proves the need for rapid medical intervention to reduce these effects. So, the researchers recommended that medical practitioners, pregnant women, and their families all be made aware of this issue. This can be achieved through educational sessions on how to manage the health problem.

Regarding studied women's knowledge, the findings of the current research indicated that there was a highly statistical significant difference between the results of post-intervention phase compared to pre-intervention phase in favor of post-intervention regarding all items of studied sample's knowledge about hyperemesis gravidarum with $p \leq 0.001$. Where, it was displayed that, one-tenth and about two thirds of studied sample had good knowledge regarding hyperemesis gravidarum at pre-intervention and post-intervention phases

respectively. While, it was revealed that less than three-quarters and about one-fifth of studied sample had poor knowledge regarding hyperemesis gravidarum at pre-intervention and post-intervention phases respectively.

This result might be due to the positive effect of tailored education program and its well-organized sessions. The study's topic was considered vital and sensitive to the studied women, so women were very interested and satisfied during the learning sessions. Moreover, women had an instructional booklet followed to minimize the complications that might affect the woman and her fetus.

This result was consistent with **Luqmanasari, (2018),** who illustrated that the respondents had insufficient knowledge about the causes and prevention of hyperemesis gravidarum and concluded that advised on health personnel to augment the knowledge counseling to pregnant women, especially for the first trimester to have great knowledge about hyperemesis gravidarum. The results were also matched with **Havnen et al, (2019),** who emphasized that extensive knowledge are needed among healthcare providers to improve care for women with HG. Understanding women perspectives and acknowledging the effect of the illness are important issues for optimal hyperemesis gravidarum management.

Furthermore, the results were also matched with **Farg and Hassan, (2019),** who mentioned that all women with hyperemesis gravidarum achieved both better score in their knowledge after the educational program intervention than before. This progression in knowledge score mirrored the positive effect of the education program.

Concerning women's health practices, the present research results illustrated that there was a highly statistical significant difference between the results of post-intervention phase compared to pre-intervention phase in favor of post-intervention regarding all items of studied sample's healthy practices about hyperemesis gravidarum with $p \leq 0.001$. Moreover, it was illustrated that about one-third and about four-fifth of studied sample had satisfactory level of healthy practices regarding hyperemesis gravidarum at pre-intervention and post-intervention phases respectively. While, it was revealed that more than two-thirds and less than one-fifth of studied sample had unsatisfactory level of healthy practices regarding hyperemesis gravidarum at pre-intervention and post-intervention phases respectively.

This improvement in the women's health practices might be due to permitted discussion for women and good communication in the education sessions with the researchers who helped them acquire knowledge about healthy practices. In addition, the educational booklet which played a vital role in helping women to acquire healthy practices and used it as a future reference.

This finding of the current research was confirmed by **Kamali et al, (2018)**, who proved that there was a significant difference between two groups in performing healthy practices after training sessions (P = 0.001). So, the mean quality of life score in the intervention group, before and after the intervention, was statistically significant (P = 0.001). This finding might be due to women's active cooperation in hands-on training, commitment, and interest in the subject and good communication between women's and researchers, which helped acquire healthy practices regarding HG.

Moreover, this result came in the same line with **Smith et al, (2020),** who mentioned

that pregnant women who suffer from HG should be educated about healthy practices that make symptoms tolerable so that you can eat and drink enough for appropriate fetal growth and have a reasonable quality of life, because medical treatment alone may not totally eliminate the symptoms.

As regards the severity of HG, the present research finding found that there was a statistical significant difference between the severity of hyperemesis gravidarum at post-intervention phase compared to pre-intervention phase in favor of post-intervention $p \leq 0.05$. This indicated an improvement in the severity of hyperemesis gravidarum. It was displayed that, the minority and more than one-third of studied sample had mild hyperemesis gravidarum at pre-intervention and post-intervention phases respectively. While, less than one-third and less than one-fifth of them had severe hyperemesis gravidarum at pre-intervention and post-intervention phases respectively.

The difference in the score severity of H.G., as reported, can be related to the positive effect of tailored education program and educational booklet which raise the women's awareness of the size and importance of the problem, leading to acquire knowledge and improve healthy practices that reflected on relieving severity of H.G.

The result of current research was similar to **Heitmann et al, (2020),** who indicated that as defined by PUQE, 62 (8.7%), 439 (61.7%) and 210 (29.5%) had mild, moderate and severe NVP, respectively. Increasingly, the results were also matched with **Farg and Hassan, (2019),** who clarified that all women with hyperemesis gravidarum achieved both better score symptoms degree after implementing the educational program than before it. This regression in PUQE score mirrored the effect of the educational program.

The present research results showed that; there was a non-significant positive correlation between total knowledge and total healthy practices regarding hyperemesis gravidarum at pre-intervention phase. While, there was a highly positive statistical correlation between total knowledge and total healthy practices regarding hyperemesis gravidarum at post-intervention phase. This finding clarified the relationships between the two learning domains and emphasizes the importance of integrating them all in the pregnant women educational programs.

Conclusion

Based on the findings of the current research; it was concluded that research hypotheses were supported and the tailored education program and educational sessions had a positive effect on the improvement of pregnant women's knowledge and reported healthy practices regarding hyperemesis gravidarum during pregnancy. Furthermore, there was a statistical significant reduction in the severity of hyperemesis gravidarum at post-intervention phase compared to pre-intervention phase. There was a non-significant positive correlation between total knowledge and total healthy practices regarding hyperemesis gravidarum at pre-intervention phase. While, there was a highly positive statistical correlation between total knowledge and total healthy practices regarding minor ailments at post-intervention phase.

Recommendations

- Dissemination of the current research tailored education program to all antenatal clinics, high risk pregnancy units and maternity hospitals at Benha city.

- Pregnant women should be surveyed for their satisfaction regularly to improve antenatal care services, such as tailored education about hyperemesis gravidarum.

- To further generalize the findings, it is strongly advised that the study be repeated in several maternity facilities using a larger representative probability sample.

- Further studies should be done for incorporation of the views and responses of health care providers because the study only relied solely on the responses of pregnant women.

References

American pregnancy Association (2020). Hyperemesis Gravidarum. Available at: https://americanpregnancy.org/pregnancy-complications/hyperemesis-gravidarum-880 Accessed on January 8. 2019. at 9 PM.

Bej P. (2018). Knowledge, attitude, and practices among pregnant women about antenatal care, and danger sign during pregnancy. Journal of Preventive Medicine and Holistic Health. 4(1). 10-15.

Beyazit F., Öztürk F., Pek E. and Ünsal M. (2017). Evaluation of the hematologic system as a marker of subclinical inflammation in hyperemesis gravidarum: a case control study. Ginekologia polska. 88(6). 315-319.

Colodro-Conde L., Jern P., Johansson A., and Medland S.E. (2019). Nausea and vomiting during pregnancy is highly heritable. Behav Genet. 46(4).481- 491 .

Dayangan, C., (2018). A case of prolonged hyperemesis resulting in hepatorenal failure, foetal distress and neonatal mortality. J Obstet Gynaecol (Lahore). 38(4).573-575.

Dean C., Bannigan K. and Marsden J. (2018). Reviewing the effect of hyperemesis gravidarum on women's lives and mental health. Br J Midwifery.26:109–19.

Dinberu M.T., Mohammed M.A., Tekelab T., and Habtewold T.D. (2019). Burden, risk factors and outcomes of hyperemesis gravidarum in low-income and middleincome countries (LMICs): systematic review and meta-analysis protocol. BMJ Open; 9: e025841. Doi: 10.1136/ bmjopen-2018-025841

Ebrahimi N., Maltepe C., Bournissen FG., and Koren G. (2009). using the 24-hour Pregnancy-Unique Quantification of Emesis (PUQE-24) scale. J Obstet Gynaecol Can. 31: 803-807.

El tamamy E.A., Abdel Fattah A.T. and Hemdan M.H.A.I. (2019). The Relation between Helicobacter Pylori Seropositivity and Hyperemesis Gravidarum in Pregnant Women during First Trimester. The Egyptian Journal of Hospital Medicine. 77 (2).4894-4898

Fabian M.S., Widera E.E., Kazek B., et al. (2018). The prenatal and perinatal risk variables of the sensory processing disorder. Clin Mother Child Heal. 15(1).1-5.

Farg D.S. and Hassan H.E. (2019). Study Hyperemesis Graviderum Requiring Hospital Admission during Pregnancy: Effect of Nursing Implication on Its Progress. American Journal of Nursing Research. 7(3).328-341.

Fejzo M, Kam A, Laguna A, MacGibbonc K. and Mullina P. (2019). Analysis of neurodevelopmental delay in children exposed in utero to hyperemesis gravidarum reveals increased reporting of autism spectrum disorder. Reprod Toxicol. 84.59-64 .

Fejzo M.S., Arzy D., Tian R., Kimber W. MacGibbon K.W., and Patrick M., (2018). Evidence GDF15 plays a role in familial and

recurrent hyperemesis gravidarum. Geburtshilfe Frauenheilkd; 78(9).866-870.

Gabra A., (2019). Complications of Hyperemesis Gravidarum; A Disease of Both Mother and Fetus, Review Article. Critical Care Obstetrics and Gynecology. iMedPub Journals. 5(1):1-5

Gupta M., Potdar N. and Owen P. (2020). Thomson AJ. The Management of Nausea and Vomiting of Pregnancy and Hyperemesis Gravidarum. Royal College of Obstetricians RCOG Green-top Guideline. 69. 11-27.

Havnen G.C., Truong M.B., Doa M.H., Heitmannc K., and Nordeng H. (2019). Women's perspectives on the management and consequences of hyperemesis gravidarum – a descriptive interview study. Scandinavian Journal of Primary Health Care.37(1). 30–40

Heitmann K. (2019). Treatment of nausea and vomiting during pregnancy. A thesis submitted to faculty of nursing. University of Bergen.

Heitmann, K., Nordeng H, Havnen, G.C., Solheimsnes A. and Holst L. (2020). The burden of nausea and vomiting during pregnancy: severe impacts on quality of life, daily life functioning and willingness to become pregnant again – results from a cross-sectional study. BMC Pregnancy and Childbirth. 17(75).2-12

Iowa State University of Science and Technology. (2020). Research Methodologies Guide (Quasi-Experimental Design). Available at: https://instr. iastate.libguid e s.com/research methods. Accessed on January 10, 2020, 9 am.

Jenabi, E., and Fereidooni, B., (2019). The association between maternal smoking and hyperemesis gravidarum: a meta-analysis. J Matern Fetal Neonatal Med. 30(6).693-697

Kamali Z., Abedian Z., Mohammad A.S. and Dehnavi Z.M. (2018). The effect of small group teaching on quality of life in pregnant women with nausea and vomiting: A clinical trial. Journal of Education and Health Promotion. 7. 112. doi: 10.4103 / jehp.jehp_162_17

Koren G, Boskovic R, Hard M, Maltepe C, Navioz Y, Einarson A. (2002). PUQE (pregnancy unique quantification of emesis) scoring system for nausea and vomiting of pregnancy. American journal of obstetrics and gynecology.186(5). 228-31.

Koren G., Ornoy A. and Berkovitch M. (2018). Hyperemesis gravidarum-Is it a cause of abnormal fetal brain development? Reprod. Toxicol. 79:84–88.

Kosus A., Ese, A., Kosus N. and Deniz Hizli D. (2019). Hyperemesis gravidarum and its relation with maternal body fat composition. Journal of Obstetrics and Gynaecology. 36(6).822-826

Luqmanasari E., (2018). Description of Knowledge Women Pregnant on First Trimester about Hyperemesis Gravidarum in Regional Health Center Tiron Multiplication District of Kediri. Indonesian Journal of Nutritional Epidemiology and Reproductive, 2(1). 1-10

MacGibbon K.W. (2020). Hyperemesis Gravidarum "Strategies to Improve Outcomes". Journal of Infusion Nursing. 43(2). 79-96

MacGibbon K.W., Fejzo M.S. and Mullin P.M. (2018). Mortality secondary to hyperemesis gravidarum: a case report. Women's Heal Gynecol. 1(2).1-7.

Mahmoud D.A. (2017). Prevalence and Risk Factors of Hyperemesis Graviderum among Egyptian Pregnant Woman at the Woman's Health Center. Med. J. Cairo Univ. 80(2).161-168.

Ng Q.X., Venkatanarayanan N., De Deyn M.L., Ho C.Y., Mo Y., Yeo W.S. (2018). A meta-analysis of the association between Helicobacter pylori (H. pylori) infection and hyperemesis gravidarum. Helicobacter.23(1). e12455.

Posternak, M. A., & Miller, I. (2001). Untreated short-term course of major depression: A meta-analysis of studies using outcomes from studies using wait-list control groups. Journal of Affective Disorders. 66.139–146.

Smith J.A., Fox K.A. and Clark S.M. (2020). Patient education: Nausea and vomiting of pregnancy (Beyond the Basics). Available at: https://www. uptodate. Com / contents/nausea-and-vomiting-of-pregnancy-beyond-the-basics/print

Spurlock DR Jr. (2018). The single-group, pre- and posttest design in nursing education research: it's time to move on. J Nurs Educ, 57(2). 69-71.

Tian R., MacGibbon K., Martin B., et al. (2017). Analysis of pre- and postpregnancy issues in women with hyperemesis gravidarum. Auton Neurosci Basic Clin; 202:73-78.doi:10.1016/j. autneu.2016.07.005.

Trovik J. and Vikanes Å. (2019). Hyperemesis Gravidarum is associated with substantial economic burden in addition to severe physical and psychological suffering. Isr J Health Policy Res. 5(1).1-5 .

WHO, (2021). Draft Recommendations for the Prevention and Management of Obesity over the Life Course, Including Potential Targets. (Version dated 19 August 2021.

تأثير برنامج تعليمي مخصص علي معلومات وممارسات السيدات الحوامل فيما يتعلق بالتقيؤ الحملي وشدته

فاطمة كمال علي - مي محمود حسن- علا عبد الوهاب عفيفي

غالبًا ما يُعرَّف التقيؤ الحملي بأنه غثيان وقيء مستعصيان أثناء الحمل. التقيؤ الحملي شديد بما يكفي للتأثير على الحالة العامة للمرأة الحامل وقد يتطلب دخول المستشفى. لذا هدفت هذه الدراسة إلى تقييم تأثير برنامج تعليمي مخصص علي معلومات وممارسات السيدات الحوامل فيما يتعلق بالتقيؤ الحملي وشدته. وقد تم إجراء البحث في قسم أمراض النساء والولادة (جناح الحمل عالي الخطورة وفي العيادات الخارجية لما قبل الولادة) في ثلاثة مستشفيات (مستشفيات جامعة بنها ومستشفى بنها التعليمي ومستشفى بنها للتأمين الصحي) على 120 إمرأة حامل. وقد خلصت الدراسة بأن تطبيق البرنامج التعليمي المخصص وجلساتة كان له تأثير إيجابي على تحسين معلومات وممارسات السيدات الحوامل فيما يتعلق بالتقيؤ الحملي. علاوة على ذلك ، كان هناك انخفاض ذو دلالة إحصائية في شدة التقيؤ الحملي بعد تطبيق البرنامج التعليمي. كما أوصت الدراسة بنشر برنامج التعليم البحثي الحالي لجميع عيادات ما قبل الولادة ووحدات الحمل عالية الخطورة ومستشفيات الولادة في مدينة بنها.