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Nursing Management Regarding Malnutrition for Pregnant Women with Hyperemesis Gravidarum

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Abstract:
Background:
*Pregnancy is the period of dynamic change for a mother requiring a lot of care**.** Hyperemesis gravidarum is a complication of pregnancy that affects various aspect of the woman's health, including malnutrition, electrolytes, kidney function, and may have adverse fetal consequences.* ***Aim of this study*** *to evaluate the effect of nursing management regarding malnutrition for pregnant women with hyperemesis gravidarum.**Research design**: A Quasi-experimental design **Setting:**study conducted in Helwan General Hospital, Ain Shams Hospital and MCH of EizbatAlwilada in Egypt**. Sample**: purposive sample (60 women and 40 nurses) was selected according to inclusion and exclusion criteria.* ***Tool:****Data was collected through two tools: first tool used with women that includeA structured interviewing questionnaire, Knowledge assessment questionnaire and Follow up sheet. Second tool used with nurses that include self-administrative questionnaire**.Result**: the majority of studied pregnant women diagnosed with moderate hyperemesis and had moderate risk for malnutrition and they have poor level of knowledge regarding hyperemesis gravidrum in pre test which is conversely changed in posttest.* ***Conclusion:****Nursing management regarding malnutrition for pregnant woman with hyperemesis gravidarum helping pregnant women, increasing their sense of wellbeing, and reducing pregnancy complications and modify their life style and improving nurses knowledge which had an effective role during management.* ***Recommendations****: shed light on the importance of modified diet as using ice food for pregnant woman with Hyperemesis Gravidarum*

Keywords: *Ice food, Hyperemesis Gravidarum, malnutrition.*

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I. Introduction

Pregnancy is the period of dynamic change for a mother requiring a lot of care. Hyperemesis gravidarum is a complication of pregnancy that affects various aspect of the woman's health, including malnutrition, electrolytes, kidney function, and may have adverse fetal consequences. Malnutrition during pregnancy has significant relation with hyperemesis gravidarum, especially deficiencies of certain vitamins and minerals that have been associated with negative pregnancy outcomes for both the mother and the fetus **(Hassan et al., 2019).**

Hyperemesis graviderum affects approximately 0.3% to 3.6% of pregnancies in USA. Where reported HG recurrence rates vary from 15.2% in a Norwegian hospital registry study to 81% if using self-reported diagnosis. In the light of a study conducted by Mahmoud (2012), this can be concluded that the overall hospital rate of hyperemesis graviderum at the Woman's Health Center, Assiut University, Egypt was 4.5% which was considered a high prevalence in relation to the universal prevalence of hyperemesis graviderum. However, the diagnosis is usually made clinically following the exclusion of other causes **(Farg&Hassan.,2019).**

Malnutrition during pregnancy has significant relation with hyperemissgravidarum, especially deficiencies of certain vitamins and minerals that have been associated with negative pregnancy outcomes for both the mother and the fetus. Severe iron-deficiency anemia has been linked to preterm labor, poor anthropometric measures and birth asphyxia Pregnant women with Emesis normally find it difficult to swallow a wide range of food that gastric acid increase will obviously occur and enables nausea and vomiting to appear so that nutritional balance is impaired. Delicious and sweet ice cream orfood also solves nausea during thepregnancy**(Lonnie, M. et al.,2018).**

Nurses play a key role in all aspects of the management of hyperemesis gravidarum. Often, they are the first to hear of the patient's complaints of nausea and vomiting. Therefore, they must have sufficient information to provide health care to pregnant women with hyperemesis graviderum**(Shilpa& Katherine., 2017).**

Aim of the study:

The aim of this study is to evaluate the effect of nursing management regarding malnutrition for pregnant woman with hyperemesis gravidarum.

This aim will be fulfilled through the following:

1. Assess nutritional status of pregnant women with hyperemesis gravidarum.
2. Determine severity of hyperemesis gravidarum among pregnant woman.
3. Assess pregnant women knowledge about hyperemesis gravidarum
4. Assess nurse's knowledge about hyperemesis gravidarum .
5. Provide nursing management regarding malnutrition for pregnant woman with hyperemesis gravidarum.
6. Evaluate the effect of nursing management regarding malnutrition for pregnant woman with hyperemesis gravidarum.

II. Subjects and Methods

Research Design:A quasi-experimental design.**Setting**:study was carried at Helwan General Hospital in Helwan – Egypt. As regard to Coronavirus pandemic the hospital was chosen as quarantine the researcher added another two setting (Ain Shams for Obstetrics and Gynecology university hospital and MCH of EizbatAlwilada.
Sampling:purposive sample**(60 women)** was selected according to inclusion and exclusion criteria.

Tools of Data Collection

Two tools were used for data collection,one for women and another for nurses**:**

I- A structured interviewing questionnaire: include three parts;

This tool was developed by the researcher used to assess the studied women regard the following:

Part 1: **Socio-demographic characteristics** included: (Name, age, address, educational level, residence and occupation).

Part 2:Obstetric history included: Age of menarche, age of marriage, number of deliveries, Type of previous deliveries, previous contraceptives, Number of pregnancy, previous complications and previous hyperemesis gravidarum.

Part 3: Current pregnancy:

- Gestational age, Present complications during pregnancy, Weight at admission, previous weight before pregnancy, BMI and number of vomiting per day according to PUQE grades (PUQE-N., 2015) which added to the tools according to expertise opinion.
- Lab investigation such as H.Pylori, Ketones in urine, Protein in urine, HG Level,Potassium level K and Sodium level Na) .

Part 4: Nutritional Life style of pregnant women and Malnutrition Universal Screening Tool (MUST)

II- Knowledge assessment questionnaire: was developed by researcher to assess pregnant women knowledge about hyperemesis gravidarum such as (definition, time, causes, high-risk, symptom, diagnosis, complications for mother and complication for fetus).

III- Follow up sheet that was constructed by the researcher for pregnant women which include a three point Liker scale (worse, same, better) was used at follow up visit to assess woman's subjective responses to intervention.

Tool of nurse's

Tool was used in this study was the **self-administrativequestionnaire:** was developed by researcher to collect information from the participants, it includes **two parts:**

First part: was design to assess personal characteristics of nurses such as age, educational level, years of experience.

Second part: was design to assess nurse's knowledge about hyperemesis gravidarum.

Preparatory phase:

It includes reviewing of literature, different studies and theoretical knowledge of various aspects of the research topic using books, articles, internet, periodicals and magazines. This also helped in designing the study tools.

Validity and reliability:

The questionnaire sheet was developed by the researchers after reviewing the related literature. Tools were tested for content validity by 3 experts in the field and they were structured interview questionnaire sheet

- **Administrative design:**

After explanation of the study aim and objectives, an official permission was obtained from the Dean of faculty of nursing and the general manager of Helwan hospital, Ainshams hospital and MCH asking for cooperation and permission to conduct the study before starting the study.

Ethical considerations

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee. Participation in the study is voluntary and a subject was given complete full information about the study and their role before signing the informed consent. The ethical considerations was include explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs was respected.

A pilot study:

A pilot study was conducted on a sample of 10% of cases, to test the feasibility of different and help in time planning necessary modifications were carried out and tools finalized, so they were excluded in the study sample.

Field work:

Field work started at the beginning of October, 2019 to the end of August 2020, the study was consuming 8 months. The study was conducted in difficult circumstances, which was the period of the Corona Virus pandemic, where the collection of data stopped for a period of three months, then the collection resumed, and in this period the researcher did the following:

- The researcher visited the study setting; the researcher meet the nurse director of setting and introduced herself and the aim of the study was explained and gave them a complete background about the study and sheet format which used to collect the required data.
- After the approval to conduct the study, the director nurse help the researcher to interview with the head nurse of the obstetrics and gynecological departments andinterviewed pregnant women and nurses at inpatient word and outpatient unit according to the criteria.
- The aim of the study was explained to each woman and nurseto gain their confidence and agreement to participate in the study and obtained their consent to participate in the study.
- The researcher visiting study setting three day in the weak.
- Data collection was carried out. The gathered date helped the researcher to assess their general condition and provide appropriate intervention accordingly.
- The researcher showed sympathy and concern for the pregnant women to gain trust and create an atmosphere of cooperation for the benefit of the pregnant women.
- The pregnant women responded effectively to the provided instructions and nursing care was provided to each woman separately, according to the health condition, whether inpatient or outpatient as shown in the booklet of nursing management which prepared by researcher after reviewing local and international literature and Guidelines for Management of Hyperemesis Gravidarum.
- The researcher provided several educational sessions about different aspect of hyperemesis and malnutrition for the available nurses in each work shift. Each session took about 30-45 minutes prepared according to the level of education of nurses. At the end of each session, feedback was invited; nurse's questions were discussed to explain any misunderstanding. Different methods of teaching were used such as lectures, group discussion, and audio-visual material as power point and videos .

As regards Evaluation : the researcher evaluate the effect of nursing management regarding malnutrition for pregnant woman with hyperemesis gravidarum by Follow up sheet that was constructed for pregnant women which include a three point Likert scale (worse, same, better) was used at follow up visit to assess woman's subjective responses to intervention .

- For in patient women; after two weeks from the patient discharge of the hospital.
- For outpatient women; the researcher done follow up after provided all nursing management and this period different from woman to woman according to their condition.
- For nurses; The researcher evaluated the effect of education regarding Hyperemesis gravidrum and malnutrition among nurses by the posttest immediately after every session.

Statistical design

The collected data in pretest and posttest were organized, categorized, tabulated according to the type of each data

Statistical analysis:

The Statistical Package for the Social Sciences (SPSS, version 17.0) was used for data analysis. Descriptive statistics were employed to summarize the demographic data, which was presented using frequency tables and expressed as percentages, mean and standard deviation. Chi-square test was used to test the associations among the under studied qualitative variables. Statistical significance was considered at P-value < 0.05 and highly significance at P-value < 0.001.

III. Results

Table (1) showed that, more than half 55% of the studied pregnant women aged between 18 to 25 years with mean of 24.8 ± 5.1 years. One third of them were illiterate /R&W (30%), while 45% of them had secondary school or a technical diploma and only their quarter (25%) had University education. As regards marital status, 90% of them were married and 3.3% were divorced.

Table (2) revealed distribution of the studied pregnant women according to their Obstetric history. More than half of them had a menarche age of 13-15 years (51.6%) with a mean age of menarche of 13.5 ± 2.1 years, and had age of marriage of 20-29 years (53.3%) with a mean age of marriage of 26.2 ± 4.3 years. Approximately one third of them were primigravida (28.3%),13.3% had abortion,majority delivered 1-2 deliveries (58.3%), and 41.7% delivered by CS. A quarter studied Pregnant women suffered from previous HG (25%) and, were admitted to hospital for this reason.

Table (3)showed that the distribution of the studied pregnant women according to their current pregnancy. Half of them were in first trimester (51.7%), and had no complications during current pregnancy (63.3%). Three quarters of them claimed that the current pregnancy was wanted (75%).The mean weight of studied pregnant women before pregnancy was 64 ± 10 Kg, while the mean weight of studied pregnant women in current pregnancy was 62.6 ± 7.9 Kg.

Table (4)highlights comparison of the Lab investigation aspects among studied pregnant women pre and post intervention. Post -intervention revealed a highly significant improvement ($p<0.0001$) in the Lab investigation items, except in "Proteins in urine?" item, where the difference was not significant statistically ($p>0.05$).

Fig.1 show that11.7% mild hyperemesis 68.3% moderate hyperemesis and 20% sever hyperemesis before management.

Fig.2:show that more than the third of studied pregnant mothers with hyperemesis gravidarum reported that iced food was effective in managing their HG (41.7%). Approximately one quarter mentioned ginger biscuit (23.3%). and Acupressure on point 6 in the hand mentioned Fifteen percent.

Table (5): highlighted the effect of the nursing management intervention regarding total malnutrition universal screening among studied pregnant women. Post -intervention program revealed a highly significant improvement ($p<0.000$) in the total malnutrition universal screening scale.

Table (6):demonstrated the effect of the nursing management intervention regarding items reflecting malnutrition for pregnant women with hyperemesis gravidarum. Post -intervention in second week revealed a highly significant improvement ($p<0.000$) in the number of vomiting per day, Weight and Food tolerance: Number of meals per day.

Table (7): Post -intervention revealed a highly significant improvement ($p<0.000$) in the total knowledge score. The post knowledge response was increased from 22.5% pre intervention to 100% post intervention and the difference was highly significant ($P<0.0001$).

IV. Discussion

The current study reveals more than half of the studied pregnant women aged between 19 to 25 years with mean of 24.8 ± 5.1 years, and third of themwere illiterate /R&W . As regards residence and their income, two third of them from urban area and have enough income. This finding supported with **Jasline.M.(2019)**in a study "A Study to Assess the Effectiveness of self-Instructional Module on Knowledge Regarding Home Care Management of Hyperemesis Gravidarum among PrimiGravida Mothers in a Selected Community Areas in Dehradun, India" who mentioned that 25% of the study subject are uneducatedwith mean age of 25.2 ± 4.3 years.

Regarding the obstetric history of the studied pregnant women, the results of the present study revealed that, Majority of them had a menarche age of 13-15 years and had age of marriage of 20-29 years with a mean age of marriage of 26.2 ± 4.3 years. Approximately one third of them were primigravida 13.3% had abortion, more than half delivered 1-2 deliveries, and near the half delivered by CS. this result agree with **(Aminu MB et al.,2020)** in the study title"Prevalence of hyperemesis gravidarum and associated risk factors among pregnant women in a tertiary health facility in Northeast, Nigeria" who mentioned that, The mean age of marriage 27 years and more than half was delivered by CS.

In same line the current study show that, one quarter of studied pregnant women suffered from previous HG and were admitted to hospital for this reason. this result agree with **(Hassan et al.,2019)** whom study"Nursing Role in Application off Nutritional Guidelines During Hyperemesis Gravidarum and Its Effect On Patients Outcomesin Egypt " who mentioned that, one third of study subjects had previous hyperemesis gravidarum and More than half of the morning sickness.

According to **Pregnancy Unique-Quantification of Emesis (PUQE)scale**, the current study revealed two third of studied women have moderate hyperemesis and 20% sever hyperemesis before management. These findings are near to congruent with**Farg.D, Hassan.E (2019)** who mentioned that one-tenth (10.0%) of HG

group have a mild PUQE grade, one half of them have a moderate degree and two-fifths (40.0%) have a severe degree.

The current study reported that a highly significant improvement before and after implementing nursing management ($p<0.0001$) in the lab investigation items, The current result is in agreement with a study that conducted by **(Anwar.A. et al., 2019)** regarding "Guideline for Management of Hyperemesis Gravidarum in Egypt" who mentioned that, There were a highly significant difference between before and after implementing guideline among the studied sample regarding Ketonuria and Potassium investigations and vital signs.

As regards of the effect of the nursing management, the current study revealed that there was highly significant in women's condition regarding number of vomiting , weight increasing and number of meals after implementing nursing management, According to number of meals and weight increasing the present study show that highly significant improvement between first and second week during follow up. this finding agree with **Farg.D&Hassan.E (2019)** who mentioned that there was positive effect in PUQE grades among Hyperemesis gravidrum group pre-intervention & post-intervention program.

According to pregnant nurse's level of knowledge the present study show that the majority of nurse's have incomplete correct answer in pretest and there are a highly significant improvement ($p<0.000$) in the total knowledge score in posttest. These findings supported by **(Hassan et al.,2019)** whom study "Nursing Role in Application off Nutritional Guidelines During Hyperemesis Gravidarum and Its Effect On Patients Outcomes in Egypt " who mentioned that, there are a highly significant improvement regarding nurses level of knowledge after implementing health education regarding hyperemesis such as Definition, causes, predisposing factors of HG, complication of HG on the mothers & their fetuses and the most effective measures for alleviating HG.

V. Conclusion

Nursing management regarding malnutrition for pregnant woman with hyperemesis gravidarum helping pregnant women, increasing their sense of wellbeing, and reducing pregnancy complications and modify their life style and improving nurses knowledge which had an effective role during management.

VI. Recommendations

In the light of the present study findings, the following were recommended:

- Shed light on the importance of modified diet as using ice food for pregnant woman with Hyperemesis Gravidarum.
- Designing and applying an educational class for the health care provider about how to utilize PQUE scoring index in diagnosis and evaluation of hyperemesis gravidarum at different antenatal clinics.
- Investigations for Helicobacter pylori for all women who are considering pregnancy in the near future.

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Table (1): Distribution of the studied pregnant women according to the Socio -demographic characteristics (N = 60)

Socio demographic characteristics	N0.	%
Age (Years)		
18 – 25 years	33	55
26 – 35 years	27	45
Mean ± SD	24.8 ± 5.1 years	
Educational Level		
Illiterate/Read & Write	18	30
Secondary school or technical diploma	27	45
University	15	25
Marital status		
Married	54	90
Divorced	2	3.3
Widow	4	6.7
Residence:		
Rural	22	36.7
Urban	38	63.3
Occupation:		
Work	34	56.7
Housewives	26	43.3
Income:		
Enough	39	65
Not enough	21	35
Total	60	100

Table (2): Distribution of the studied pregnant women according to their Obstetric history (N = 60).

Obstetric history		N0.	%
Age (Years) of menarche:	10- 12 years	25	41.7
	13-15 years	31	51.6
	16 – 17 years	4	6.7
Mean ± SD		**13.5 ± 2.1 years**	
Age of marriage:	< 20 years	24	40
	20-30 years	32	53.3
	>30 years	4	6.7
Mean ± SD		**26.2 ± 4.3 years**	
N0. Of pregnancy:	primigravida	17	28.3
	2-3 pregnancies	29	48.3
	> 3 pregnancies	14	23.4
N0. Of abortions:	Yes	8	13.3
	No	52	86.7
N0. Of deliveries:	Zero	20	33.3
	1-2 deliveries	35	58.3
	3 -4 deliveries	5	8.4
Types of previous deliveries:	Zero(None)	20	33.3
	Normal delivery	15	25
	CS	25	41.7
Previous contraception:	No	20	33.3
	Yes	40	66.7
Previous complications:	Non	20	33.3
	Abortion	8	13.3
	Hypertension	10	16.7
	Delivery complications	7	11.7
	Previous HG	15	25
Previous admission to hospital for history of HG:	No	45	75
	Yes	15	25
Total		60	100

Table (3): Distribution of the studied pregnant women according to their current pregnancy (N = 60)

Current pregnancy		N0.	%
Gestational age):			
First trimester		31	51.7
Second trimester		27	45
Third trimester		2	3.3
Complications during current pregnancy:			
Non		38	63.3
Hypertension		14	23.3
Gestational diabetes		4	6.7
Pre - eclampsia&eclampsia		4	6.7
Current pregnancy is wanted?	No	15	25
	Yes	45	75
Pre – pregnancy weight :	**Mean ± SD**	**64 ± 10 Kg**	
Current pregnancy weight : **SD**	**Mean ±**	**62.6 ± 7.9 Kg**	
Total		**60**	**100**

Table (4): Distribution of the studied pregnant women according to their lab investigation pre- and post-intervention (N = 60)

Lab investigation	pre- intervention N=60		post intervention N=60		*χ^2/LR	P value
	N0	%	N0	%		
H.pylori : No	52	86.7	60	100	**8.5**	<0.003
Yes	8	13.3	0	0		
Ketones in urine: No	22	36.7	60	100	55.1	<0.0001
Yes	38	63.3	0	0		
Proteins in urine: No	54	90	58	96.7	2.1	0.14
Yes	6	10	2	3.3		
Hb level: <10	21	35	0	0	57.0	<0.0001
≥ 10	39	65	60	100		
K level : Abnormal	14	23.3	0	0	15.7	<0.0001
Normal	46	76.7	60	100		
Na level : Abnormal	14	23.3	0	0	15.7	<0.0001
Normal	46	76.7	60	100		
Total	60	100	60	100		

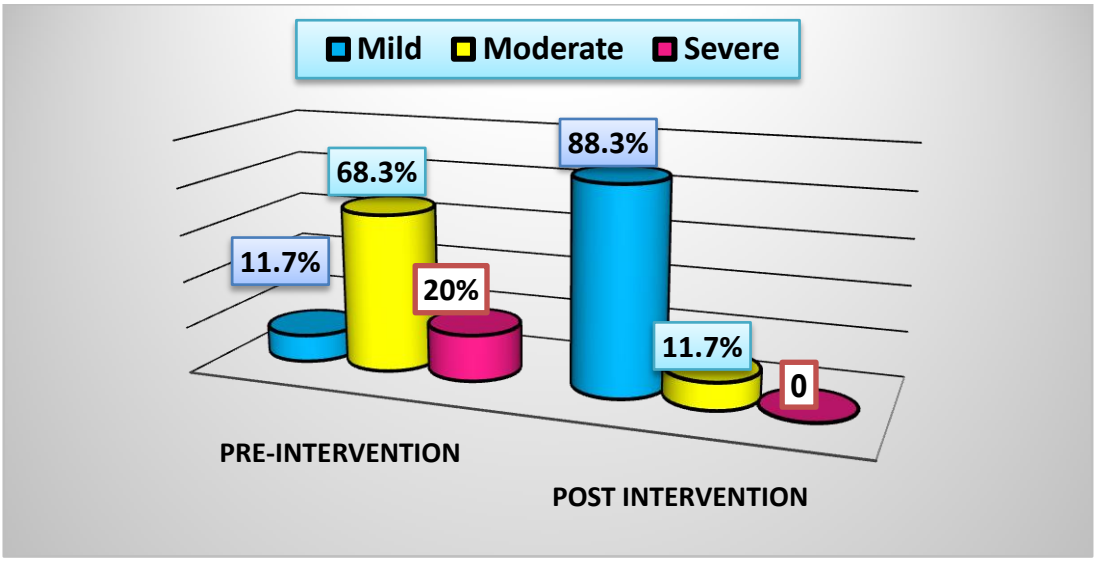

Fig.1: Distribution of the study subjects according toPregnancy-Unique Quantification of Emesis and Nausea(PUQE) grades

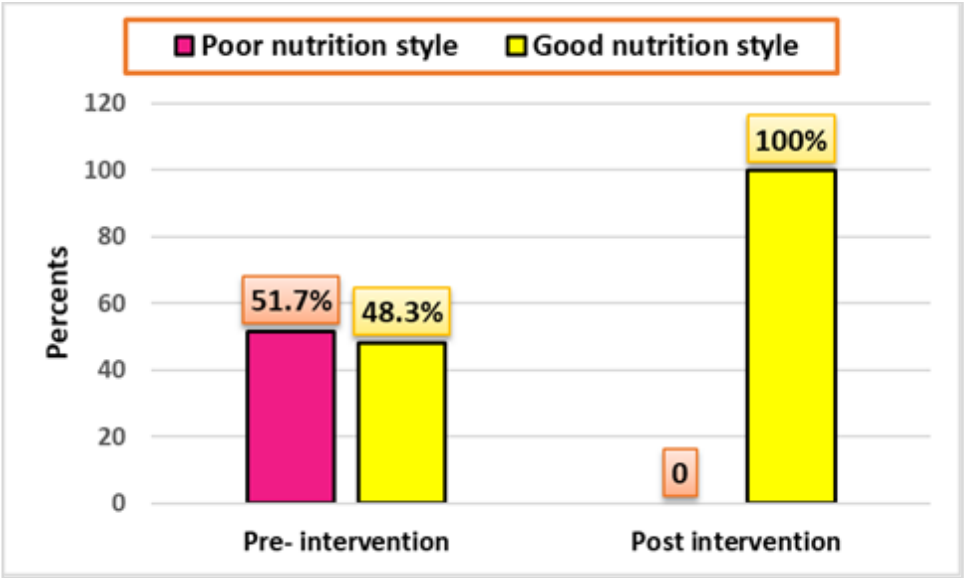

Fig.2: Effect of nursing intervention on nutritional style groups pre and post intervention (N=60)

Table 5: **Distribution of the studied pregnant women according to Malnutrition Universal Screening among studied pregnant women pre and post intervention(N=60)**

Malnutrition Universal Screening	pre- intervention N=60		post intervention N=60		*χ^2/LR	P value
	N0	%	N0	%		
BMI (kg/m2:						
> 20	27	45	51	85	16.5	<0.0001
18 – 20	33	55	9	15		
< 18	0	0	0	0		
Weight loss in 3-6m.:						
< 5 %	33	55	49	81.7	15.1	<0.0001
5– 10 %	27	45	11	18.3		
> 10%	0	0	0	0		
Acute disease effect , or is likely to be no, or nutritional intake for > 5 days:						
	50	83.3	60	100	8.6	<0.001
No	10	16.7	0	0		

Yes						
Total nutrition scale(risk for malnutrition): **0 (Low risk)** **1(Moderate risk** **2&3(High risk)**	 2 46 12	 3.3 76.7 20	 39 21 0	 65 35 0	22.3	<0.0001
Mean total score of nutritional scale	19.4 ± 4.5		23.8±1.8		t=21.5	<0.0001
Total	**60**	**100**	**60**	**100**		

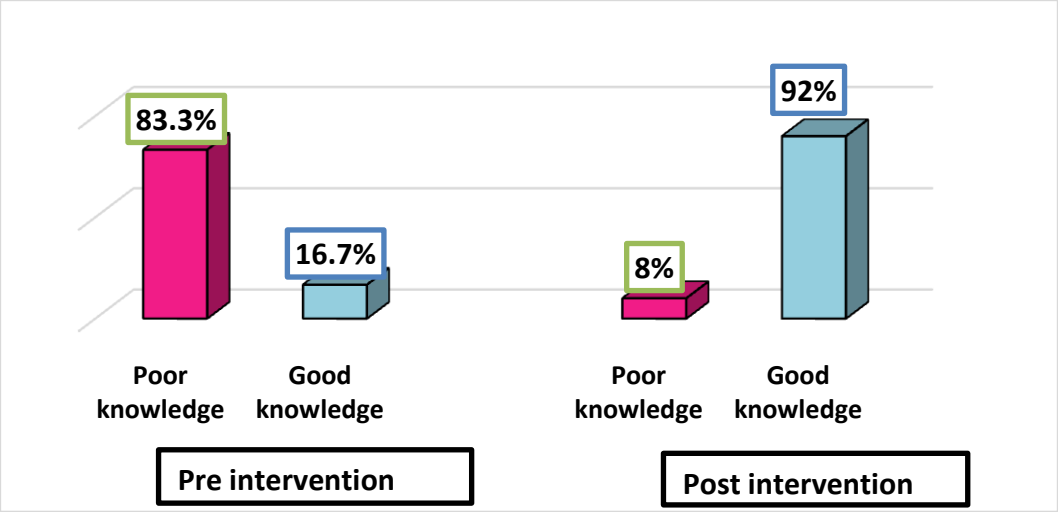

Fig.3: Effect of the nursing management on the total score of pregnant women's knowledge about the hyperemesis gravidarum(N=60)

Table (6): Evaluating the effect of nursing managment regarding hyperemesis gravidarum in first and second weeks post intervention for pregnant women with hyperemesis (N=60).

Items	**First weeks**			**Second weeks**			**P value**
	Worse N0. (%)	**Same N0. (%)**	**Better N0. (%)**	**Worse N0. (%)**	**Same N0. (%)**	**Better N0. (%)**	
Number of vomiting per day	**0**	**7 (11.7)**	**53 (88.3)**	**0**	**53 (88.3)**	**7 (11.7)**	**X2=69.9, P<0.0001**
Weight increase or not	**0**	**45 (75)**	**15 (25)**	**0**	**11 (18.3)**	**49 (81.7)**	**X2=38.9, P<0.0001**
Food tolerance : Number of meals per day	**0**	**1 (1.7)**	**59 (98.3)**	**0**	**7 (11.7)**	**53 (88.3)**	**X2=4.8, P<0.02**

Table 7: Pre, and post- intervention, nurses responses to total knowledge assessment questionnaire about hyperemesis gravidarum(N=40).

Total Knowledge score of nurses	Pre intervention program		Post intervention program		Test of sig.	P value
	Poor Knowledge N0. (%)	Good knowledge N0. (%)	Poor Knowledge N0. (%)	Good knowledge N0. (%)		
Total knowledge score	31 (77.5%)	9 (22.5%)	0 0	40(100%)	X^2=97.3	<0.0001 HS
X± SD	17.6 ± 4.4(11 -26)		37.2± 1.5(33 -39)		t= 74.5	<0.0001