

Effect of Educational Session on Knowledge, Self-Care Practices and Perception Regarding Gestational Weight Gain among Advanced Age Pregnant Women

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Abstract

Pregnant women at an advanced age 35 year or more are exposed to an increased risk of excessive or insufficient Gestational Weight Gain (GWG), which may exacerbate pregnancy outcomes, which represent a double burden of risk along with the risk of pregnancy at an advanced age, which leads to maternal, fetal, and neonatal risks. Many advanced age gravidas have poor knowledge, self-care practices as well as poor perception about gestational weight gain, their consequences and management strategies. Educational interventions seem to be the most appropriate and beneficial choice for these women to prevent being overweight or underweight during pregnancy. **Aim:** the aim of the current study was to assess effect of an educational session on improving pregnant women's knowledge, self-care practices and perception regarding GWG among advanced age pregnant women. **Methods:** A quasi experimental design was used to conduct the study. **Sample:** A total of 75 advanced age pregnant who attended maternal and child health center at (Badr City) were recruited. Data was collected by a structured self-administered questionnaire, gestational weight gain knowledge and self-care practices questionnaire (pre/posttest) and women perception scale. **Result:** There were a significant improvement in the total knowledge, self-care practices and perception score after educational session ($P = 0.000$) as (62.7%) of the participants had poor knowledge pretest compared to (81.3%) had good knowledge posttest. Also, there was significant differences in total self practice score before and after the session ($p=0.000$). More than two third (70.7%) had poor self-care practices pretest compared to (78.7%) had good self-care practices posttest. In addition to there was significant differences in total perception score before and after the session ($p<0.001$). About (74.7%) had negative perception pre teaching session compared to (90.7%) had positive perception post intervention **Conclusion:** The educational session has an impact on improving advanced age pregnant women's knowledge, selfcare practices and perception about proper weight gain during pregnancy. And the inclusion of programs to control GWG in antenatal care is very important, especially with advanced age pregnancy. **Recommendation:** Counseling on maternal diet and exercise programs should be included in antenatal care guidelines especially with advanced age pregnancy

Keywords: Advance Age Pregnancy, Gestational Weight Gain, Perception, Knowledge, Self Care Practices

Introduction:

Women who stay healthy during pregnancy and after childbirth are more likely to have a better delivery and stay healthy later in life. Pregnancy and childbirth are a normal physiological process, but pregnancy after the age of 35 increases the possibility of factors that negatively affect the immediate and future health of the women and their fetus (AbdAllah et al., 2020).

Approximately 26% of all births in 2018 were to women of Advanced Maternal Age (AMA). (AMA) frequently well-defined as a birth at age 35 years and older; it has become increasingly common in the Egypt (AbdAllah et al., 2020). Greatly of this shift is due to delayed births. There are many factors about this phenomenon, including socio-economic conditions contribute to women's decisions to delay childbearing, increased educational attainment and labor market participation, the desire for smaller families, late age of marriage

and availability of advanced assisted reproductive techniques. (Youssef Ibrahim et al., 2019).

Women of AMA are more frequently overweight before the pregnancy and are more likely to have previous medical or surgical history (Lin et al., 2019). Furthermore, Aging is an independent risk factor for maternal and child adverse outcomes (Madoué et al., 2019). As well as parity also make difference as the primiparous women are experiencing an excessive Gestational Weight Gain (GWG) more than multiparous (Lan-Pidhainy et al., 2013).

Advanced age gravida women may disregard pregnancy weight management recommendations, as they perceived it will make her baby and her pregnancy at risk. Furthermore, they are considering importance of more diet intake for developing their fetus. And they must consume enough calories and nutrients to provide the essential requirements for both themselves and the developing fetus. Moreover, in adequate or limited physical activities during pregnancy is very important to keep their fetus in and avoid to be aborted (Alebachew et al., 2021).

Unsatisfactory knowledge, self-care practices and perception lead to excessive or in sufficient weight gain during pregnancy and can increase the incidence of adverse outcomes (Soliman et al., 2019). Too much gestational weight gain contributes to increased rates of maternal and perinatal complications, illness and sometimes even death. While, gaining less gestational weight is associated with preterm birth and low birth weight. The combination of over weight gain in pregnancy and poor diet quality, followed by less than recommended postpartum weight loss makes pregnancy a major risk factor for obesity and related chronic diseases (e.g. diabetes, certain cancers) in women in later life (Anita & Weeks, 2018), (Restall et al., 2014).

Recent data showed that nationally, about half of elder pregnant women gain more weight than the current Institute of Medicine guidelines (Santos, 2016). In 2009, the Institute of Medicine (IOM) published revised guidance on GWG that accounted for the mother's pre-pregnancy BMI with regard to recommendations for total GWG and weekly weight gain during the second and third trimesters (Cantor et al., 2021), (Rafat et al., 2022).

The IOM guidelines recommend the following cut-off values for adequate GWG: a total weight gain of 12.5–18 Kg for underweight BMI women (≤ 18.5 kg/m²), a total weight gain of 11.5–16 kg for normal BMI women (18.5–24.9 kg/m²), a total weight gain of 7–11.5 kg for overweight women (BMI of 25–29.9 kg/m²), a total weight gain of 5–9 kg for all obese women (BMI of 30 kg/m² or greater) (Fayed et al., 2022).

(Anita & Weeks, 2018) are reflecting upon GWG, it is crucial to recognize that discordant GWG is both an independent and a modifiable risk factor for many pregnancy complications (Chamara et al., 2019). In other words, the risks for discordant GWG exist regardless of a woman's pre-pregnancy BMI. For example, a healthy normal-weight woman with a low-risk pregnancy could put advanced age women at higher risk for negative outcomes by gaining too much weight in pregnancy (Frouk et al., 2021).

A convincing amount of the literature regarding GWG shows that intervention during pregnancy, or even pre-pregnancy, can help to mediate maternal-fetal health risks (Hill et al., 2019). GWG is modifiable because it can, fortunately, be mediated through conscious healthy lifestyle choices by the mother. For example, a woman with obesity who may already be at higher risk because of her current weight may reduce her risk of complications by gaining within the IOM Guidelines (Ruangvutlert et al., 2021). Therefore, it is essential that pregnant woman and women planning to become pregnant are aware of the IOM's GWG recommendations. It is equally important that these women have access to weight management resources that are in agreement with their prenatal healthcare provider (HCP) (Refaat & Ahmed, 2016)

Nurses especially and other healthcare providers have a crucial role to support women to achieve the recommended gestational weight gain and advise women on the recommended range of GWG based on pre-pregnancy BMI, and that they track and discuss weight progress over the course of pregnancy, as well as offering tailored counseling on dietary intake and weekly physical activity programs (Brien et al., 2019).

Many educational interventions have aimed to reach GWG towards a favorable range; For instance, the March of Dimes 2017 has published multiple nutrition handouts and online resources

to address the importance of raising awareness regarding GWG, and also focuses on the prevention of births complications (Blondin & Logiudice, 2018).

Unfortunately, only a few have succeeded (Bookari et al., 2017). One possible explanation for this failure may lie in the fact that interventions have not attempted to account for women's underlying values related to gaining weight (Nikolopoulos et al., 2017). The extent to which an advanced age pregnant considers the importance of self-care practices for maintaining weight during pregnancy is likely to influence their motivation to act, and to follow instructions regarding recommendations for pregnancy weight gain (Blondin & Logiudice, 2018).

Significance of the Study:

The percentage of pregnant women of advanced maternal age (AMA, pregnant women >35 years of age) has increased; this percentage accounts for approximately 60% of all pregnancies, and half of these women are older than 40 years (Lin et al., 2019). Women of AMA are more frequently overweight before the pregnancy, and are more likely to have had medical or surgical problems, and are more likely to be multiparas; moreover, age is an independent risk factor for maternal and child adverse outcomes. Therefore, AMA pregnancy management aims to improve pregnancy outcomes.

In addition, women of AMA may disregard pregnancy weight management recommendations and excessive weight gain during pregnancy can increase the incidence of adverse outcomes which may affect the immediate and future health of the woman and her fetus by increasing rates of maternal and perinatal complications, illness and sometimes even death.

Lack of physical activity and excessive or less dietary intake, knowledge deficit regarding GWG standard, sequential GWG risks perceived among advanced age pregnant women proved to worse pregnancy outcomes. Although there are studies on controlling excess weight during pregnancy locally and globally, there are few studies on the study of GWG among pregnant women at an advanced age. The current study aimed to assesses effect of educational session on knowledge, self-care practices and perception

regarding gestational weight gain among advanced age pregnant women.

Aim of the Study:

This study aimed to assesses the effect of educational session on knowledge, self-care practices and perception regarding gestational weight gain among advanced age pregnant women through:

- Assessing AMA pregnant women' knowledge regarding GWG.
- Assessing AMA pregnant women' self-care practices regarding GWG.
- Assessing AMA pregnant women' self-care practices regarding GWG.
- Investigating the relation between AMA pregnant women' knowledge, self-care practices and perception regarding GWG.
- Evaluating the effect of health educational session on AMA pregnant women' knowledge, self-care practices, and perception regarding GWG.

Hypotheses of the Study:

1. There will be a significant improvement of knowledge level about gestational weight gain among AMA pregnant women post educational session.
2. There will be a significant improvement on the perception self-care practices level about gestational weight gain among AMA pregnant women post educational session.
3. There will be a significant improvement on the perception about gestational weight gain among AMA pregnant women post educational session.

Subjects and Method:

Research Design: A quasi-experimental (pretest/posttest) design was utilized in current study. The effect of independent variable (educational sessions & self-instructional booklet) on the dependent variable (advanced age pregnant women' knowledge, self-care practices and perception regarding gestational weight gain) were examined in the current study.

Research Setting:

This study was conducted at maternal and child health center at Badr City. It is a new city in Cairo far from the dawn town. This health center is located between two big universities and provides maternal and child health services, prenatal care, and reproductive health services. Most of the visitors to the center are residents of the city and work in nearby universities.

Sampling:

Anon-probability purposive sample of a total of 75 advanced age pregnant women who attended prenatal clinic waiting rooms at pre mentioned setting, in this study according to the following inclusion criteria were recruited in the study; advanced age pregnant women aged of 35 years or more, singleton pregnancy, and attended during their first and second trimester. The following women's were excluded from the study: multiple pregnancy, and women's diagnosed with any medical conditions that might affect their normal weight gain such as autoimmune disorders, gestational diabetes, hypertension, renal disease, cardiac disease, thyroid, eating disorders and hyperemesis gravidarum.

Sample Size Calculation:

Considering level of significance of 5%, study power of 80%, 82 pregnant women were recruited by using the following formula:

$$n = \frac{[2(Z \alpha/2 + Z \beta)]^2 \times p(1-p)}{(p1 - p2)^2}$$

Recruitment of the Sample:

This study included 82 advanced age pregnant women. They were allocated into 8 groups. Each group included about 10 women. During the study period, 7 women dropped because they haven't time to attend the upcoming sessions.

Tools of Data Collection:

Three data collection tools were used developed by the researchers based on extensive review of literatures.

1. **A Structured Self-Administered Questionnaire:** It was developed by the researchers to collect the pregnant women's general characteristics and consisted of two parts; part one questions

regarding demographic characteristics such as age, level of education, occupation, and residence. While part two is about the obstetric history such as gravidity, parity, gestational age at and BMI at enrollment time.

2. **Gestational weight gain Knowledge and self-care practices Questionnaire:** It consisted of two parts. Part one about 12 closed end questions to assess the level of knowledge of weight gain and its risk of over or less weight gain and 13 questions regarding practices about healthy weight during pregnancy as physical activities, diet, and proper nutritional requirements. The scoring system was calculated as: (1) for "correct" answer and (0) for "incorrect" answer.

The total score ranges from 0 – 25, higher score indicates good knowledge and practices. It was categorized for each woman into "good, fair and poor knowledge" Women whose score below 60% were categorized as having a poor knowledge of the risks of improper weight gain. While those who got 60%-80% correct answers were categorized as having fair knowledge, while Women who had >80% categorized as good.

3. **Women Perception of GWG Scale:** to assess advanced age women's perception about pregnancy weight gain. It is a Likert Scale consists of 13 statements with three response's ranges between unknown =1, disagree = 2, to agree = 3. The total score was calculated for each woman. The total score was ranged from 13 to 39. It categorized as negative perception ≤ 60% and positive perception > 60%

Tool Validity and Reliability:

Face and content validity of the questionnaire were assessed by 5 panel experts in the field of (Maternal and Newborn Health Nursing). They reviewed the questionnaire and gave their feedback. Some modifications were carried out according to the panel judgment on clarity of the sentences and appropriateness of the content. Reliability test was assessed by applying the questionnaire on 10 pregnant women as a pilot study to check validity,

reliability, feasibility, and applicability of the questionnaire using test-retest. Also, pilot study determined the appropriate time required to conduct the educational session. Based on its result changes were carried out.

Procedure:

After approvals to conduct this study was obtained, the researchers introduced themselves to antenatal women who met the inclusion criteria and informed them about the purpose of the study, benefit, and risk in order to obtain their acceptance to participate in the study as well as to gain their cooperation. Informed consent was obtained from each woman who agreed to participate in the study. The researchers ensured that women's data were confidentially kept. The questionnaire was anonymous. The woman was informed that they can withdraw from the study at any time. The researchers were constructed and prepared power point presentation and instructional guided booklet. Data collection was carried out through three phases. Interviewing/assessment, implementation, and evaluation.

Interviewing /assessment phase: In this phase, data collected over a period of 6 months from beginning of June to end of November 2021 in the MCH clinics from 9 AM to 1 PM, five days per week. Three tools were used, self-administered close ended questionnaire were carried out by each woman. Socio-demographic characteristics, obstetrical history as well as knowledge, self-care practices and perception assessment about pregnancy weight gain (pretest) were collected. This interview and assessment phase consumed about 15-30 minutes for each woman; the questionnaire was written in Arabic language and documented the answer in the tools utilized.

Implementation phase: In this phase, the session aims were explained to the women at the beginning of the session. The session lasted for about 45-60 minutes. The main objective of the session was to aware advanced age pregnant women about recommended weight gain during pregnancy. The session content was included: definition of weight gain, how to calculate BMI, ideal weight gain during pregnancy, the risk associated with overweight or underweight during pregnancy for both women and fetus. Self-care practices as

nutritional requirements, diet and physical activities and exercise as well as misperceptions regarding weight gain that the woman practice during pregnancy. Audiovisual materials such as PowerPoint, videos and pictures were used to clarify the session content. Furthermore, distribution of instructional guided booklet.

Evaluation phase: In this phase, all women reassessed regarding their knowledge, selfcare practices and perception (posttest) about weight gain during pregnancy. This posttest consumed about 15-20 min for each woman.

Ethical Considerations:

Approvals to conduct this study were obtained from Badr University in Cairo Research Committee. And MCH center administrators. All women were informed about the purpose of the study, benefit, and risk in order to obtain their acceptance to participate in the study. There were no risks to the women. An informed consent was obtained from each woman who agreed to participate in the study. All events that occurred during educational session considered confidential, and data and information that they share were confidential. Also, the women were assured about their right to withdraw at any time. Privacy and confidentiality were completely protected, no identifiers or personal information were collected or stored including participant's name, IDs, and others.

Statistical Analysis:

Data was coded, tabulated, and analyzed by using SPSS version 20 statistical software. According to study objectives, the descriptive statistics were in form of means, standard deviations, frequency, and percentage. Inferential statistics were informed of Paired t test, and Chi Square test. Probability of error (p-value) < 0.05 considered significant.

Results:

This study was conducted to assess the impact of an educational session about gestational weight gain on advanced age pregnant women's knowledge, selfcare practices and perception, 75 women were included in the study sample. Each woman did

the pretest to assess her knowledge, self-care practices and perception toward gestational weight gain and attended an educational session and completed the post test.

Table (1) shows frequency distribution of participants' socio-demographic characteristic. The mean age \pm SD of 39.62 ± 3.97 years old. Almost two third of them (68%) completed their secondary and university education and about three quarters (78.6%) were working as administrative and manual work while one fifth were housewife. Almost two third of them (69.3%) were from rural. And all of them (100%) did not receive any counseling regarding GWG.

Table (2) shows frequency distribution of the participants' obstetric characteristics. Almost of participants were primigravida (53.3) and (46.7) were multigravida about half of them in their second pregnancy, and one fifth of them their fourth pregnancy or more. And 61.3 % were in first trimester. Regarding for their pregnancy many of them (76.0) were getting their normal conception while 24% their pregnancy was through Assisted Reproductive Technology. In addition, the mean \pm SD of BMI was 31.4 ± 3.2 , more than one third of the sample (36%) their BMI was overweight, while 22.7% were obese, and 28% were normal.

Figure (1) illustrates the comparison of pre and post teaching total knowledge scores among participants regarding their GWG; nearly two thirds (62.7%) of the participants had poor knowledge regarding gestational weight gain before intervention compared with the majority of them (81.3%) had good knowledge post intervention. There was highly statistically significant increase in total knowledge score one month post intervention compared to pre intervention among participants ($p < 0.001$).

Figure (2) describes the comparison of pre and post teaching total self-care practices

scores among participants regarding their GWG; nearly two thirds (70.7%) of the participants had poor self-care practices regarding gestational weight gain before intervention compared with most of them (78.7%) had good practices post intervention. There was highly statistically significant increase in total self-care practices score one month post intervention compared to pre intervention among participants ($p < 0.001$).

Figure (3) describes the comparison of pre and post teaching total perception scores among participants regarding their GWG. It shows that, nearly three quarters (74.7%) of the participants had negative perception of gestational weight gain pre intervention compared with most of them (90.7) had positive perception post intervention. And there was highly statistically significant difference ($p < 0.001$).

Table (3) clarifies the comparison between participants' knowledge and self-care practices mean scores regarding weight gain during pregnancy, the current result shows a limited knowledge among the participants. There was statistically significant difference between pre and post intervention regarding women's knowledge about gestational weight gain definition, proper weight gain during pregnancy according to their BMI as well as risk factors of less or increased weight gain ($p = 0.000$). In addition, there were statistically significant difference ($p = 0.000$) between pre and post intervention regarding women's self-care practices as nutritional requirement and diet regimen as well as physical activities frequency and types for controlling weight gain during pregnancy.

Table (4) represents a highly significant positive correlation between women's total satisfactory knowledge and their total satisfactory practices and positive perception regarding gestational weight gain ($p < 0.001$).

Table (1): Frequency Distribution of the Participants According to Their Socio-demographic Characteristics (n=75)

Socio -demographic Variables	N (%)	
Age Range (Years):	▪ 35 - <40	49 (65.3)
	▪ 40 - <45	16 (21.3)
	▪ 45 ≤ 50	10 (13.4)
	{ Mean ± SD 39.62± 3.97 }	
Level of Education:	▪ Read & write	12 (16.0)
	▪ Basic	12 (16.0)
	▪ Secondary	26 (34.7)
	▪ University	25 (33.3)
Occupation:	▪ Administrative Work	31(41.3)
	▪ Manual Work	28 (37.3)
	▪ Housewife	16 (21.4)
Residence Area:	▪ Urban	23 (30.7)
	▪ Rural	52 (69.3)
Perceived Counseling Regarding GWG:	▪ Yes	0 (0.0)
	▪ No	100 (100.0)

Table (2): Frequency Distribution of the Participants According to Their Obstetric Data (n=75)

Obstetric' Variables	N (%)	
Parity:	▪ Primi-gravida	40 (53.3)
	▪ Multi-gravida (n=35)	35 (46.7)
	○ 2 nd	17(48.6)
	○ 3 rd	11(31.4)
	○ ≥ 4	7(20.0)
Gestational Age (Trimester):	▪ 1 st Trimester	46 (61.3)
	▪ 2 nd Trimester	29 (36.7)
Pregnancy Type:	▪ Normal	57 (76.0)
	▪ ART	18 (24.0)
BMI (Kg/M²):	▪ Under Wt. (BMI < 18 Kg/M ²)	10 (13.3)
	▪ Normal Wt. (BMI 18- 24.9 Kg/M ²)	21 (28.0)
	▪ Over Wt. (BMI 25 -29.9 Kg/M ²)	27 (36.0)
	▪ Obese (BMI > 30 Kg/M ²)	17 (22.7)
	{ Mean ± SD=31.4 ± 3.2 }	

Figure 1: Comparison of Pre and Post Teaching Knowledge Scores Among Participants Regarding GWG (N=75):

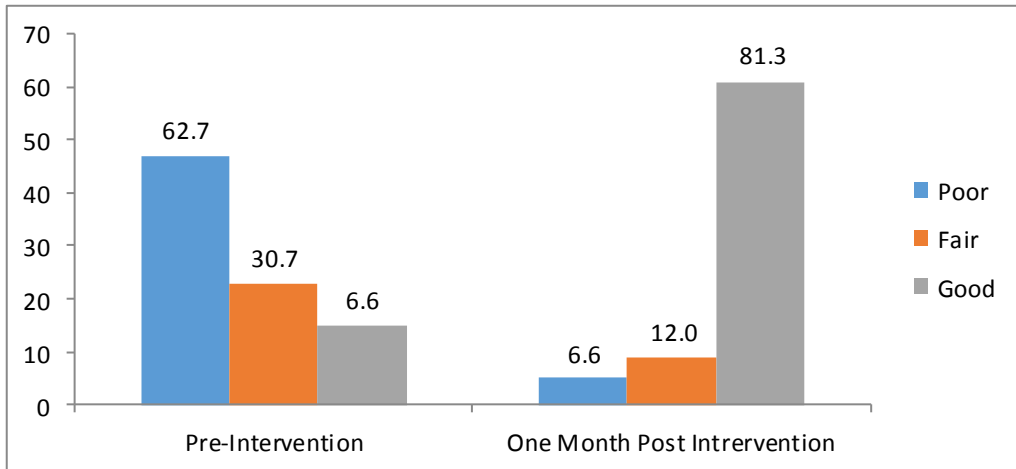


Figure 2: Comparison of Pre and Post Teaching Self-Care Practices Scores Among Participants Regarding GWG (N=75):

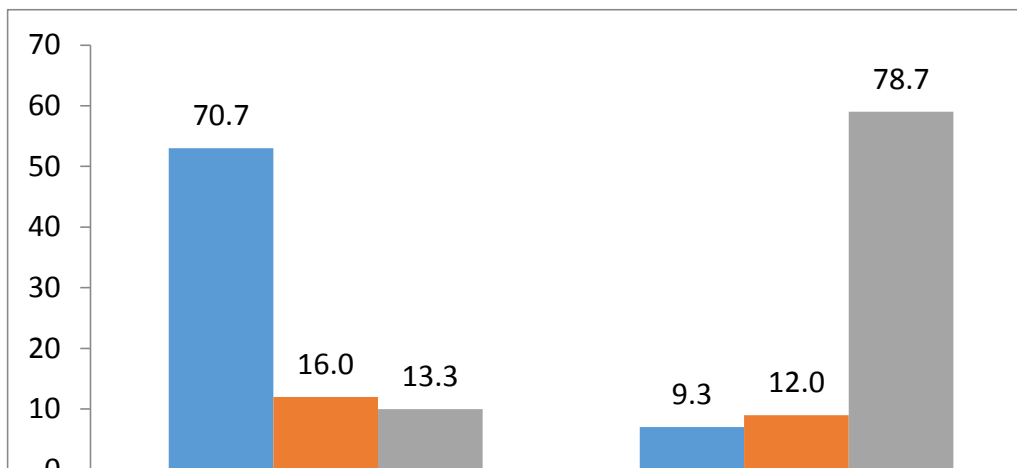


Figure 3: Comparison of Pre and Post Teaching Perception Scores Among Participants Regarding GWG (N=75):

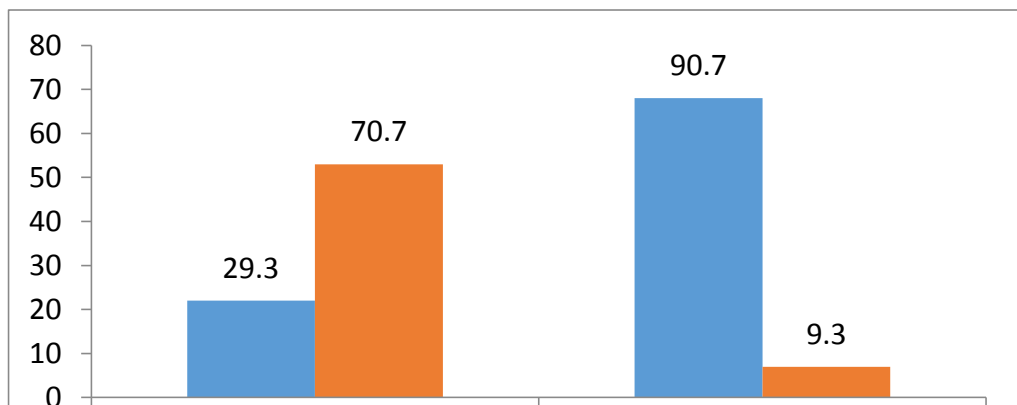


Table 3: Comparison between Participants' Knowledge and Self-Care Practices Mean Scores (N=75)

Knowledge and self-care practices	Before Teaching Mean± SD	Post Teaching Mean± SD	X ²	P Value
GWG Definition	1.40±0.96	3.20±1.16	62.679	0.000*
BMI index And Weight Gain	0.0±0.01	2.53±1.17	99.486	0.000*
Risk Factors	1.80±0.76	3.80±1.01	85.714	0.000*
Complications	1.60±0.36	3.40±0.41	43.073	0.000*
Nutritional Requirement and Diet	2.77±1.25	5.53±1.51	64.705	0.000*
Physical Activities and Exercises	1.77±0.25	6.53±1.63	30.947	0.000*
Total Knowledge Scores	9.34±1.24	24.99±6.62	46.344	0.000*

* Significant at $p < 0.05$

Table 5: Correlation between Women's Total Satisfactory Knowledge and Their Self-Care Practices and Perception.

Items	Total Knowledge					
	Pre		Post		Follow up	
	r	P-value	r	P-value	r	P-value
Total Self Care Practice	0.284	<0.001*	0.395	<0.001*	0.323	<0.001*
Total Perception	0.384	<0.001*	0.425	<0.001*	0.332	<0.001*

<0.001* means highly statistically significant.

Discussion

Prevalence rates of maternal obesity (pre pregnancy BMI>30kg/m²) differ across low-income countries (Yoosefi et al., 2018). Pregnancy in a period of 35 years or more exposes mothers to many risks that affect the outcome of pregnancy. Women whose weight exceeds the standard rates or decreases during pregnancy have different adverse results for the mother, fetus, and child after birth. Previous studies confirmed that pregnancy at an advanced age is prone to weight gain and obesity, so women's knowledge and their perception of the risks of obesity and the need to adhere to self-practices to maintain the normal rate of gestational weight gain is very important.

Among the previous studied advanced age prenatal maternal outcomes that result from excessive GWG are pregnancy-associated hypertension (including preeclampsia and eclampsia) and risk of complications in labor and delivery. Furthermore, in the postpartum period, weight retention can lead to higher weight status in subsequent pregnancies as well as weight retention and other long-term maternal health consequences such as increased risk for type 2 diabetes and cardiovascular diseases (Lin et al., 2019).

So that this study was conducted to assess advanced age pregnant women's knowledge, self-

care practices and perception regarding gestational weight gain risks at selected Maternal and Child Health Centers at one of the new cities of Cairo.

Regarding demographic characteristics of study participants the current study results showed that, advanced age pregnancy could occurs in advanced age at age 50 years with a mean ± SD age 39.62± 3.97'. About two third (65.3%) of study subject their age ranged from 35-<40 years, while minority (13.4%) of them their age ranged from 45-≤ 50 years. This finding agreed with studies conducted by (Madoué et al., 2019) who studied the Pregnancy and delivery in advanced maternal age: epidemiologic aspects and prognosis

Regarding the educational level the findings, revealed that two third of the study participants had secondary or university education, and other one third were able to read and write or had basic education. Concerning the occupation the current study revealed that majority of subjects were working while minority were housewives. As regard to residence area more than two third of participants were from rural area.

The current study findings' regarding socio-demographic characteristics may agree with some previous studies or differ, but due to the nature of the MCH center setting of the study is next to the university, and most of the visitors to the center

are from the workers of the university, and the opportunity to work in universities is more for those who have passed academic qualifications, and the type of occupations are between administrative and services or manual work. In addition the range of advanced age of the women was also higher up to 50 years, which confirms that work, the demand for livelihood and the requirements of living led to an increase in the age of marriage and thus pregnancy which is similar with (Youssef Ibrahim et al., 2019) who studied *causes of elder married in his study pregnancy outcomes in pregnant women for the first time after the age of thirty five years*.

About perceived counselling or health education and instructions regarding GWG in current or previous pregnancy, all women reported that they did not receive any advice about weight gain during pregnancy and its possible adverse outcomes. This finding is consistent with many studies that many health care providers for pregnant women ignore the rates of weight gain during pregnancy as decided by (Anita & Weeks, 2018) in their study about *weight gain counselling in prenatal care : assessing and improving patient-healthcare provider interactions*.

Regarding to the obstetrics' data of the study participants the current findings revealed that the more than half of participants were primigravida and other participants were multigravida about half of them in their second pregnancy, and one fifth of them their fourth pregnancy or more. And about two third were in the first trimester. Concerning their pregnancy type the majority of them were getting their normal conception while one quarter were getting their pregnancy through Assisted Reproductive Technology. As for, the mean \pm SD of BMI of the participants was 31.4 ± 3.2 , more than one third of the sample their BMI was overweight, and about one fifth obese, while only on quarter nearly them were had normal BMI.

Regarding to participants knowledge about weight gain during pregnancy: The current results showed that the pre and post teaching total knowledge scores among participants regarding their GWG are highly statistically significant ($p < 0.001$), and nearly two thirds of the participants had poor knowledge regarding gestational weight gain as (definition, ideal body

mass index, appropriate weight gaining in pregnancy , calculating BMI, risk factors, and complicated maternal and fetal outcomes) before interventions compared with the majority of them had good knowledge post intervention.

The above mentioned results are in agreement with previous studies in many countries. locally as (Frouk et al., 2021) who studied *women ' s knowledge about risk of excessive gestational weight gain risks at selected maternal and child health centers at Minya Governorate*. Arab countries as (Alweldawi et al., 2018) who studied *impact of an educational session about gestational weight gain on Saudi pregnant women's knowledge and perception*. And international such as (Brien et al., 2019) who studied *impact of maternal education on response to lifestyle interventions to reduce gestational weight gain : individual participant data meta-analysis*.

Concerning the self-care practices regarding GWG among participants the comparison of pre and post teaching total self-care practices scores results revealed that nearly two thirds of the participants had poor self-care practices regarding gestational weight gain (nutritional requirement , diet and physical exercise) before intervention compared with the majority of them had good practices score post intervention. There was highly statistically significant increase in total self-care practices score one month post intervention compared to pre intervention among participants ($p < 0.001$).

The current study results regarding poor self-care practices of elder pregnant women regarding physical exercise and nutritional requirement before intervention were in the line with (Collison, 2015) who studied, *food and nutrition technical assistance iii project evidence on the effectiveness of counseling on excess weight gain during pregnancy*. And (Lott et al., 2019) who studied, *patient attitudes toward gestational weight gain and exercise during pregnancy*. The researchers found that this may be because not all participants were aware of any instructions regarding GWG, even though some had had prenatal care in previous pregnancies.

As regard to perception scores among participants regarding GWG, the current study results showed that, nearly three quarters of the participants had negative perception of gestational

weight gain pre intervention compared with the majority of them had positive perception post intervention. And there was highly statistically significant difference ($p < 0.001$). The current study findings' reflected that after intervention elder pregnant woman perceived the importance to enter their current pregnancy with ideal body weight and instruct other with this important information. Likewise, A lot of misconceptions about consuming a lot of meals and amount during pregnancy for two persons (as mother and fetus), excessive eating of unbalanced meals because of pregnancy cravings, and a lot of eating sweets or, appetizers, fast food, spicy food and fats have changed after the intervention.

Furthermore, findings the current study revealed that the correlation between women knowledge, self-care practices and perception regarding GWG was represented a highly significant positive correlation between women's total satisfactory knowledge and their total satisfactory self-care practices and positive perception regarding gestational weight gain ($p < 0.001$). This is accepting by (Hill et al., 2019) who studied *preconception and antenatal knowledge and beliefs about gestational weight gain*

The current study findings' summarized, more that elder pregnant women know about what is GWG and its normal increases rates in each trimester according to pre-pregnancy BMI, and the more awareness of the potential risks, the more misconceptions are corrected, and the better self-care measures they will practice.

Conclusion

According to the results of this research, there was an unsatisfactory level of knowledge and negative perception as well as poor self-care practices about excessive or less weight gain during pregnancy and its effects before the intervention, and the majority of women had not perceive any instructions regarding this important factor affecting their pregnancy outcomes especially with their pregnancy classified as risk by advanced age. Women's ability to effectively overcome these issues during pregnancy can be limited by their lack of awareness of their personal BMI, gestational weight gain goals, and effective weight loss strategies. So the current study accepted the hypothesis of advanced age pregnant women who receive educational

sessions about gestational weight gain will have higher total knowledge, self-care practices and perception scores post intervention than pre-intervention.

Recommendations:

The findings of the study illustrate the importance of the following:

- Establishing health education services as a primary prevention of excessive weight gain in high-risk pregnant women.
- Counseling on maternal diet and exercise programs should be included in antenatal care guidelines especially with advanced age pregnancy
- Encourage research into health promotion campaigns aimed at preventing unnecessary weight gain during normal and high risk pregnancy.
- Health care providers especially nurses should be well trained with GWG controlling strategies.

Further researches to study:

- Facilitators and barriers to health care providers implementing GWG guidelines in their clinical practice.
- The effects of psychological influences on excessive or less GWG among normal and high risk pregnancy.

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