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# Effect of Educational Program Regarding Specific Nutrition on Pregnant women's knowledge at an outpatient clinic in Assiut women's Health Hospital

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***Abstract:*** **Nutrition during pregnancy can influence the health of the mother and her newborn. Nutritional education is essential to enable antenatal mothers to understand the knowledge of nutrition to develop effective strategies to reduce malnutrition and encouraging healthier dietary behaviors. The study aimed to evaluate the effect of an educational program regarding specific nutrition for pregnant women at outpatient clinic in women's health hospital, Assiut University. Subjects and Methods: A Quiz-experimental pre and post-test research design was used in this study. Setting: the study was conducted at the outpatient clinic in women's health hospital, Assiut University Sample: Quota sampling used in this study; the total number of pregnant women was 108. Tools of the study: which contained three tools; tool I: Socioeconomic scale developed by Abd-Eltwab, 2012, tool II included obstetrical data and tool III nutritional sheet which contained questions to assess women's knowledge about specific nutrition during pregnancy. Results: there was a statistically significant difference between the level of pregnant women's knowledge of pre and post-test (0.000*) with mean ± SD 13.75 ± 9.66 on pre & on post-test became 38.75 ± 7.30 respectively. Conclusion: Education program leads to significant improvement in pregnant women's knowledge regarding specific nutrition during pregnancy. Recommendation: Continuous health education programs to improve pregnant women's knowledge toward specific nutrition during pregnancy.**

***Keywords:*** **Educational Program, Nutrition, Pregnant women.**

## 1. INTRODUCTION

Balanced nutrition is one of the human beings required for proper functioning of the human body system. Good nutrition is essential for human health, physical growth, mental development, performance and productivity throughout all life span**. (Paknahad et al., 2019).** The nutrition requirement varies according to age, gender and during physiological changes such as pregnancy, because it is a critical period in a woman's life where there are many physiological and biological changes occurred to meet the mother's usual requirements as well as the needs of the growing fetus and enabling mother to maintain her own stores of nutrients required for fetal and infant health as well as for future breastfeeding practices**. (Desta et al., 2019)**

Balanced nutrition during pregnancy helps to maintain normal growth and development of the fetus. It also helps to improve delivery outcomes and prevent childhood diseases later in life, such as heart diseases and obesity **(Tahir et al., 2019).** During pregnancy, unhealthy nutrition of the mother or an inability to meet the nutritional requirements leads to some health problems for the mother and the infant such as anaemia, osteomalacia and pregnancy toxaemia can be seen in pregnancy. Other risk factors may be increased such as stillbirth, premature birth, congenital anomalies and mental retardation. Risks increase in infants due to insufficient and unbalanced nutrition **(Koletzko et al., 2019).**

Micronutrients are essential for women's health during reproductive years and during pregnancy as well as during adolescent and post-menopausal periods. There are adverse effects of deficiencies in micronutrients on the health and birth outcome of women. Although there are many causes for these deficiencies, particularly deficiencies of calcium, iron, folate, zinc, thiamine, riboflavin and vitamins A, D, B-6, and B-12 are very frequent and of concern among women of reproductive age **(Cetin et al., 2019).** Deficiencies in this micro nutrition increase the risk for adverse pregnancy outcomes such as neural tube defects, early fetal loss, preeclampsia and maternal mortality **(Lim et al., 2018 and Su et al., 2016).**

There are many significant effects of nutrition during pregnancy in the short and long -term health of the mother, fetus and infants; it is known that pregnant women are most affected by the insufficient and unbalanced nutritional problems in the developing countries **(Davies et al., 2016).** The main causes for inadequate and unbalanced nutrition of pregnant women are failure to intake nutritional supplements required for increasing needs of pregnancy and lactation, failure to purchase nutrients that are suitable in nutritional content due to low socioeconomic status, wrong nutrient selection due to tradition and customs, mistakes during storage, preparation and cooking of foods **(Ulger et al., 2017).**

Knowledge of nutrition is an essential element to ensure positive pregnancy outcomes, is integral to achieve healthy dietary behaviors and subsequently improves their quality of diet (**Suh et al., 2016).** Recommendations Nutrition Intake (RNI) reported that the nutritional knowledge during pregnancy is necessary to ensure optimal gestational weight gain and reduce complications, both of which are associated with positive birth outcomes and contribute to the overall health of the mothers. However, evidence revealed that mothers during pregnancy do not always follow these recommendations and the reasons for this are poorly understood **(Malaysian Dietary Guidelines, 2017).**

Nutrition education is the foundation for any program intended for nutritional improvement. The knowledge about proper nutrition and a balanced diet during pregnancy are considered important for the well-being of both mother and fetus. Nutrition Education programs are important as they target at enhancing subjects dietary intake by promoting a change of behavior such as food choice and cooking ability, goal setting, motivation and support the efforts for a change **(Sunuwar et al., 2019 and Dunneram & Jeewon, 2015).**

Nurses are health care professionals essential to provide nutrition advice to pregnant women due to their usual contact with the women through antenatal care. Moreover, health promotion and education are considered the most important activities that nurses perform with pregnant women as advocates for health and wellbeing rather than managers of diseases **(Arrish et al., 2017).** However, studies in the United Kingdom (UK) and Sweden reported that nurses struggle to provide dietary advice, especially in the context of health promotion and on challenging issues such as obesity, despite that the acknowledging it as part of their role **(Wennberg et al., 2014).**

**Significance of the Study:**

Healthy nutrition is very critical before, during and after pregnancy. The nutritional status of women during the childbearing years of life has significant long-term consequences on the health and well-being of the mother and the growing fetus **(Asamoah and Ampofo, 2017).**

Nutritional health education programs for pregnant women have been mounted over the years in developed countries, leading to maximized the pregnant women and their children's health. In Egypt, such programs as a component of antenatal care are still underperformed and their effect is understudied. Antenatal care is got not only in governmental maternal and child health care centers, but also in the private sector, which is usually understudied in academic research in spite of its considerable weight**;** so this study was carried out.

**Aim of the study:**

To evaluate the effect of an educational program regarding specific nutrition for pregnant women at the outpatient clinic in women's health hospital, Assiut University.

**Research hypothesis:**

***Hypothesis****:* The knowledge of pregnant women regarding specific nutrition during pregnancy improved after implementation of the educational program.

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## 2. SUBJECT AND METHODS

***Research design:*** A Quiz-experimental study pre and post-test research design were used in this study.

***Settings of the study:*** the study was conducted at the outpatient clinic in women's health hospital, Assiut University that provides obstetric & gynecological services for rural and urban women in all Assiut governorates.

***Sampling*:** Quota sampling used in this study. The total number of pregnant women attending an outpatient clinic at the women's health hospital, Assiut University in the previous six months from January to July/2018 was 1030 , Sample size was calculated by using EPI info 7, using expected frequency of good knowledge to be 50% with a confidence level 99% and confidence limit 5%, the calculated sample size was 404. The educational program applied to 25% of this sample and increased to become 108 to avoid dropout and refuse.

***Inclusion criteria:*** The study included all pregnant women, free from medical disorders and agrees to participate in the study**.**

***Tools of the study***

Collect the data regarding socioeconomic, obstetrical and knowledge about nutrition by using interviewing questionnaire; it contains three tools:

**Tool I:** It included socioeconomic scale which developed by ***Abd-Eltwab, 2012*** to assess the socioeconomic status of the family and consists of 4 dimensions which include the following: parent's level of education (8 items), parent's occupation (2 items), total family monthly income (6 items), lifestyle of the family (3 items). Each item has one score; the total score was divided into three classes as high from 85% -100%, moderate from 60%-84% and low class less than 60%.

**Tool II:** this tool designed by the researchers after reviewing the related national and international literature; It included obstetrical data , such as gravidity, parity, pregnancy stage, history of abortion and complication of pregnancy...etc.

**Tool III**: it included 28 questions to assess women's knowledge about specific nutrition during pregnancy, which consisted of questions about iron, calcium, iodized salt, folic acid and supplementation; for each item ask questions in which the pregnancy stage required to it, duration, food sources importance during pregnancy, health risks for the baby and the pregnant women,…….etc.

***Scoring system of the knowledge:*** the total score of knowledge was 71 points (derived from 28 questions). Each correct answer was given one mark and incorrect and don't know answers were given zero. The score of each item summed-up and then converted into a percent score. It was categorized as follows: a score of ≥ 50% and above was considered a satisfactory level of knowledge and a score of < 50% was considered as an unsatisfactory level of knowledge.

This tool was done two times, the first time on pretest to assess the women's knowledge regarding specific nutrition and the second time was done after implementing the educational program to re-assess the level of knowledge.

***Validity of the tools***:

The tools were transferred to Arabic language and reviewed to ascertain their content validity by five experts in nursing sciences as Gynecological and obstetrics nursing, family and community health nursing who reviewed the tools for clarity, relevance, comprehensiveness, understanding and applicability according to the opinions of the experts the modification was done.

***Reliability of the tools:***

Reliability of tool I and tool II, was assessed by using alpha-Cronbach test to test the internal consistency was (r1=0.811 and r2=0.877) respectively.

**Procedure:**

**Administrative design:**

- **An official approval letter** was obtained from the Dean of Faculty of Nursing, Assiut University to the director of outpatient clinics in women's health hospital, Assiut University. These letters include permission to apply the study and explains the purpose and nature of the study.

- **Ethical consideration**: The research proposal was approved by the ethics committee in the Faculty of Nursing, Assiut University. There was no risk to study subjects from conducting the research. The study was following common ethical principles in clinical research. Oral consent obtained from pregnant women who were willing to participate in the study after explaining the nature and purpose of the study. Confidentiality and anonymity were assured. Study subjects had the right to refuse to participate or withdraw from the study without any rationale at any time and study subjects' privacy was considered during data collection.

- **A pilot study** was carried before starting data collection on 10% (10) of pregnant women who excluded from the total sample of the study for doing some modification. The pilot study aimed to test the clarity of the tools and estimate the time required to fill the sheets.

**The educational program**

**I- Assessment phase:**

From the first contact, the researchers introduced themselves to the participants and explain the nature and purpose of the study. The participants' agreement was obtained; then the researchers established the previously mentioned tools to assess the women's socioeconomic status and their knowledge about nutrition, which denote women's knowledge deficit regarding specific nutrition during pregnancy. Therefore, the researchers developed the educational program based on the review of relevant national and international literature. Therefore, this program aimed to gain the pregnant women's knowledge regarding specific nutrition during pregnancy.

**II- Planning phase:**

This phase involved the arrangement of conducting the program; included contents, teaching place, time, sessions, handout, teaching methods and materials.

- **Contents:** the program included information about specific nutrition for pregnant women's during pregnancy, which included iron, calcium, iodized salt, folic acid, supplementation, for each item collecting data about (Which pregnancy stage need for it, importance during pregnancy, source, deficiency, health risk for baby and the pregnant women.

- ***Teaching Time:*** the program was conducted at morning shift according to the attendance of pregnant women.

- ***Teaching place:*** the program was conducted at the antenatal clinic in the nursing room or waiting area in the outpatient clinic at the women's health hospital, Assiut University.

- **TTeaching methods and materials**: the researchers used simple teaching methods like lectures, discussion and brainstorming. Media as power point presentation by using laptop, blackboard and handouts.

**III- Implementation phase (post-test):**

- The participants were divided into 10 groups ranged between 10-11 pregnant women in each group.

- The program contents were taken in one session about 45 minutes. The session divided into two parts; the first part included explanation about the importance of nutrition during pregnancy for participants and some of the essential elements (iron, calcium, iodized salt) for half an hour, then a period of rest for 10 minutes and the second part included folic acid and its supplementation for half hour.

- The researchers distributed handouts for participants and used simple teaching methods as lecture, brainstorming and discussion.

- The current study was applied in six months starting from August 2018 until January 2019.

**IV- Evaluation stage:** In this stage, the researchers evaluate the program immediately after completing of the session to reassess the knowledge of pregnant women regarding specific nutrition (posttest).

**Data management and statistical analysis**

- Data were entered, cleaned and recorded using the Statistical Package for Social Science (SPSS Inc., Chicago, IL, USA) version 22.

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- Data were presented as a number, percentage, mean and standard deviation.
- Chi-square test was used to compare between qualitative variables.
- Paired samples t-test was used to compare quantitative data between pre and post variables.
- Statistical significance level was considered when $p < 0.05$ for all statistical tests.

**Limitations of the study:**

- Due to the smaller sample size, which was used in the present study, generalizations of the findings can be difficult to apply.

## 3. RESULTS

**Table (1): Distribution of pregnant women regarding to their socio-demographic characteristics.**

| Socio-demographic characteristics | No. (108) | % |
|---|---|---|
| **Age:** (years) | | |
| < 25 | 25 | 23.1 |
| 25 – 30 | 48 | **44.4** |
| > 30 | 35 | 32.4 |
| Mean ± SD (range) | 29.63 ± 6.25 (19.0 – 49.0) | |
| **Women's Education:** | | |
| Illiterate | 10 | **9.3** |
| Read & write | 18 | 16.7 |
| Basic education | 27 | **25.0** |
| Secondary | 21 | 19.4 |
| University | 32 | **29.6** |
| **Husband's Education:** | | |
| Illiterate | 3 | 2.8 |
| Read & write | 5 | 4.6 |
| Basic education | 10 | 9.2 |
| Secondary | 44 | 40.7 |
| University | 46 | **42.6** |
| **working status of the women:** | | |
| Working | 30 | 27.8 |
| House wife | 78 | **72.2** |
| **Husband's Occupation:** | | |
| Employee | 66 | **61.1** |
| Farmer | 5 | 4.6 |
| Skilled worker | 11 | 10.2 |
| Unskilled worker | 16 | 14.8 |
| Free business | 10 | 9.3 |
| **Residence:** | | |
| Rural | 58 | **53.7** |
| Urban | 50 | 46.3 |
| **Social Class:** | | |
| Low | 23 | 21.3 |
| Middle | 60 | **55.6** |
| High | 25 | 23.1 |

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**Table (2): Distribution of pregnant women in regards to their obstetrical data**

| Obstetrical data | No. (108) | % |
|---|---|---|
| **Pregnancy stage:** | | |
| First trimester | 8 | 7.4 |
| Second trimester | 39 | 36.1 |
| Third trimester | 61 | **56.5** |
| **No. of gravidities:** | | |
| PG | 12 | **11.1** |
| 2 – 3 | 54 | **50.0** |
| 4 or more | 42 | 38.9 |
| **No. of parities:(96)** | | |
| ≤ 3 | 54 | 56.3 |
| 4 or more | 42 | 43.7 |
| **Abortion:** | | |
| No | 71 | **74.0** |
| 1 – 2 | 17 | 17.7 |
| Recurrent | 8 | 8.3 |
| **Duration since last pregnancy:** | | |
| < 2 years | 40 | 41.7 |
| ≥ 2 years | 56 | **58.3** |
| **History of complication for pregnancy:** | | |
| Yes | 21 | **21.9** |
| No | 75 | 78.1 |
| **Type of complications:≠** | | |
| Infection | 11 | 52.4 |
| Hemorrhage | 10 | 47.6 |

**Table (3): Relation between women's knowledge on pre-test and post-test at Assiut city**

| Knowledge level | Pre-test (n= 108) | | Post-test (n= 108) | | P-value |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| **Unsatisfactory** | 103 | 95.4 | 43 | 39.8 | 0.000* |
| **Satisfactory** | 5 | 4.6 | 65 | 60.2 | |
| **Mean ± SD** | 13.75 ± 9.66 | | 38.75 ± 7.30 | | 0.000* |

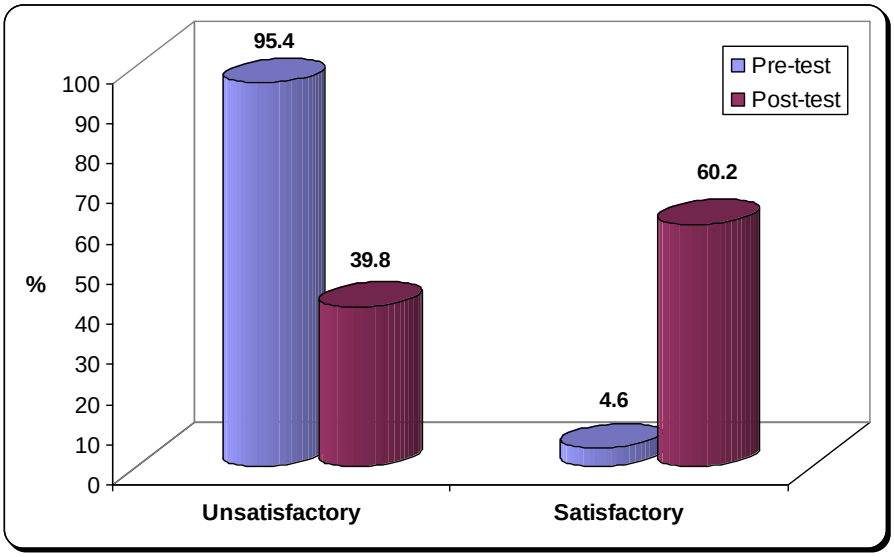


**Figure (1): Comparison between the levels of knowledge among pregnant women on pre-test and post-test at Assiut city**

**Table (4): Relation between pregnant women's total score of knowledge and their some Socio-demographic characteristics on pre and post-test**

| Socio-demographic characteristics | Knowledge score on pre-test | | | | P-value | Knowledge score on post-test | | | | P-value |
|---|---|---|---|---|---|---|---|---|---|---|
| | Unsatisfactory | | Satisfactory | | | Unsatisfactory | | Satisfactory | | |
| | No. | % | No. | % | | No. | % | No. | % | |
| **Age:** (years) | | | | | 0.451 | | | | | 0.033* |
| < 25 | 25 | 100.0 | 0 | 0.0 | | 9 | 36.0 | 16 | 64.0 | |
| 25 – 30 | 45 | 93.8 | 3 | 6.3 | | 14 | 29.2 | 34 | 70.8 | |
| > 30 | 33 | 94.3 | 2 | 5.7 | | 20 | 57.1 | 15 | 42.9 | |
| **Women education:** | | | | | 0.026* | | | | | 0.047* |
| Basic education or less | 55 | 100.0 | 0 | 0.0 | | 28 | 50.9 | 27 | 49.1 | |
| Secondary | 18 | 85.7 | 3 | 14.3 | | 7 | 33.3 | 14 | 66.7 | |
| University | 30 | 93.8 | 2 | 6.3 | | 8 | 25.0 | 24 | 75.0 | |
| **Husband education:** | | | | | 0.207 | | | | | 0.010* |
| Basic education or less | 18 | 100.0 | 0 | 0.0 | | 12 | 66.7 | 6 | 33.3 | |
| Secondary | 43 | 97.7 | 1 | 2.3 | | 19 | 43.2 | 25 | 56.8 | |
| University | 42 | 91.3 | 4 | 8.7 | | 12 | 26.1 | 34 | 73.9 | |
| **Social class:** | | | | | 0.008* | | | | | 0.003* |
| Low | 23 | 100.0 | 0 | 0.0 | | 16 | 69.6 | 7 | 30.4 | |
| Middle | 59 | 98.3 | 1 | 1.7 | | 21 | 35.0 | 39 | 65.0 | |
| High | 21 | 84.0 | 4 | 16.0 | | 6 | 24.0 | 19 | 76.0 | |

**Table 1** shows that 44% of pregnant women were aged from 25 -30 with a range (19.0–49.0), 29.6% of them had university education followed by basic education 25.0% and only 9.3 were illiterate while 42.6% of their husband had university education. As regards occupation, most of the pregnant women (72.2%) not working on the other hand 61.1% of their husband were employers. Also the table clears that 53.7% of pregnant women live in rural areas and more than half of them (55.6%) had middle social class.

**Table 2** clears that 56.5% of pregnant women were in the third trimester of pregnancy, 50.0% of them were multigravida and only 11.1% were primigravida; also this table observed that 74.0% of pregnant women have not history of abortion, more than half of them (58.3%) their last pregnancy since ≥ 2 years and only 21.9% of them have complications during pregnancy.

**Table 3** indicates that there was statistically significant difference between the level of pregnant women's knowledge of pre and post-test (0.000*) with mean ± SD 13.75 ± 9.66 on the pretest while on post-test mean ± SD became 38.75 ± 7.30;which reflect improvement in women's knowledge about specific nutrition during pregnancy.

**Figure 1** revealed comparison between levels of knowledge among pregnant women in pre and post-test; which observed that knowledge of women's on pre-test were 95.4% unsatisfactory while only 46% satisfactory compared to 60.2% satisfactory on post-test.

**Table 4** showed the relation between pregnant women's total score of knowledge and social-demographic characteristics of pre and post-test which cleared that there wasn't statistically significant difference between women's knowledge and their age on pre-test (P value=0.451); Whereas on post-test there was a statistically significant difference between the knowledge score of pregnant women and their age (P value=0.033*). On the other hand, there was statistically significant difference between the knowledge score of pregnant women's and their education level and social class on pre and post-test, respectively (P value= 0.026* &0.047* and P value= 0.008* &0.003*).

## 4. DISCUSSION

Nutrition plays a vital role in life. Good nutrition is an important component of a healthy lifestyle for everyone. Specific nutrition during pregnancy has a significant impact on maternal and outcomes of pregnancy.

The current study aimed to evaluate the effect of an educational program on pregnant women's knowledge regarding specific nutrition during pregnancy at Assiut University.

This study indicated that the level of women's knowledge regarding specific elements of nutrition, improved after implementation of the educational program

The present study cleared that more than two-fifths of the pregnant women aged from 25-30 years; this result agrees with **Zelalem et al., (2017)** who carried a study about" the effect of nutrition education on pregnancy specific nutrition knowledge and healthy dietary practice among pregnant women." the study recorded that more than two-fifths of women's were aged from 25-29. Whereas disagrees with **Sindhu et al., (2017)** who found that the majority of pregnant women were between 21 to 30 years of age. In addition, this result came in contrast with **Lim et al., (2018)** who conducted a study in Malaysia about "knowledge of nutrition during pregnancy and associated factors among antenatal mothers in a tertiary teaching hospital." the study reported that less than one third of women's were aged from 25 to 29.

According to the educational level of the pregnant women the finding of the current study revealed that more than one quarter of the participated pregnant women had university education while about one fifth of them had secondary education. This result consistent with a study about " Evaluation of nutrition education during pregnancy and nutritional knowledge of pregnant women in Ankara." who conducted by **Ulger et al; (2017)** and found that more than one quarter of the studied samples had university education.

Regarding the working status of the pregnant women, it was found that more than two thirds of the participated pregnant women in this study were housewives. This result agrees with **Fallah et al., (2013)** who found that almost of the mothers were housewives. On the other hand, this result disagreement with **Suh et al., (2016)** who found that less than two fifths of the participants were housewives

In accordance to residence; the result of current study showed that more than half of the participated pregnant women were living in rural areas. This result may be attributed to the outpatient clinic in Assiut University as it is accessible and visible for a large portion of the population, especially who live in rural areas with low and middle socio economic status; also this service offer with minimal charge.

Regarding the knowledge level about specific nutrition among pregnant women, the result of the present study found that only a few of them had a satisfactory level of knowledge before the educational program while this score improved to become nearly two thirds after implementation of the educational program. Also, there was statistically significant difference between the level of knowledge among pregnant women's on pre and post-test (0.000*).

This result consistent with study conducted in Ethiopia by **Zelalem et al., (2017)** who mentioned that after nutritional education program, there are improved in women's knowledge during pregnancy (nearly 50%).

Also, this study agrees with a study conducted by **Khalifa et al., (2015)** in Egypt about "Effect of nutritional health education on awareness of pregnant women attending maternal and child health care centers and private clinics in Sharkia Governorate." who revealed that there are nearly three quarters percent improvement in the level of knowledge after applying the educational program.

In addition, the present study consistent with **Sukandara et al., (2015)** in Indonesia who conducted a study about "the effects of nutrition education on the nutritional knowledge, attitude and practice of mother. " the study concluded that there are improvement in the levels of knowledge after educational program.

Also, the current results were in agreement with **Fallah et al., (2013)** in Iran who conducted a study about "Effects of nutrition education on levels of nutritional awareness of pregnant women." the study found that there is improvement in the awareness level of pregnant women who received educational sessions on healthy nutrition.

These results came in agreement with **Mohamed (2014**) in Egypt in a study about "Weight gain restriction for pregnant women attending family health care in the 1st District in El Obour City (An intervention study)". The study showed that improvement in the level of knowledge after intervention.

The finding of the present study cleared that there wasn't statistically significant difference between the level of women's knowledge and their age (P value =0.451) before the educational program; this result agrees with **Lim et al., (2018)** who reported that there wasn't statistically significant differences between the level of women's knowledge and their age. Moreover, there were statistically significant differences between two items after implementation of the educational program (P value =0.033).

The current study observed that there was statistically significant difference between the level of women's knowledge and their educational level before and after the educational program; These results are matched with a study conducted in Malaysia by (**Zahara et al., 2014);** about "nutritional status and nutritional knowledge of Malay pregnant women in selected private hospital". Who recorded that pregnant woman with a good level of education had better understanding when being exposed to educational program about nutrition. These findings also agree with **Daba et al., (2013)** who carried study about "assessment of knowledge of pregnant mother on maternal nutrition and associated factors in Ethiopia". The study showed that there is a relation between the educational level of pregnant women and understanding of information.

This may be due to the level of education that is one of the key predicting factors for nutritional knowledge and clarified that pregnant woman with a good education accompanying with higher knowledge and enhanced their understanding of information through educational program media.

The current study revealed a significant association between social class and nutritional knowledge score among pregnant women. This result accords with **Suh et al., (2016)** who carried a study about "knowledge and attitude of pregnant mothers toward maternal dietary practices during pregnancy." The study reported that there was a significant association between monthly household income and nutritional knowledge among pregnant women.

This may be attributed to the socioeconomic status, which has effects on women's knowledge as the income is considered one of the greatest factors that influenced the women's ability to receive complete nutritional information.

## 5. CONCLUSION

The present study finding reflected that the educational program improved the pregnant women's knowledge regarding specific nutrition during pregnancy.

## 6. RECOMMENDATIONS

Based on the study findings the following recommendations are suggested:

- ccontinuous health education programs to improve pregnant women's knowledge toward specific nutrition during pregnancy.
- Pposters and educational materials about specific nutrition during pregnancy should be located in well-visible areas in outpatients' and private clinics.
- FFurther studies on larger sample size to generalized the results of the study in the community.

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