# Effect of Nursing Intervention on knowledge, Attitude and Self -Care Activities among Gestational Diabetic Women

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*Abstract:* **The antenatal period in the life of the pregnant woman is very vital. It needs recognition of gestational diabetes mellitus information that can influence the promotion of their attitude & self-care, consequently, the disease control. The purpose of the study was to assess the effect of nursing intervention on knowledge, attitude and self-care activities among gestational diabetic women. Setting: it was conducted in two MCH centers from Shebin Elkom MCH centers follow Shebin Elkom district, Egypt after random selection using a multistage random technique. Design: a quasi-experimental (pre & post) research design was used. Sample: A purposive sample of 60 pregnant women with controlled gestational diabetes for three months duration were recruited. Study instruments: three instruments were used in this study. a structured interviewing questionnaire which consists of three parts; the second instrument was a Diabetic Attitude Scale-Version 3(DAS-3). The third instrument was a Summary of Self-Care Diabetes Activities (SDSCA) scale. Results: The higher percentage (56.7%) of age among GDW under the study was between 31 years and more. Three quarters (75.0%) of them were not working (households), while three quarters (75%) of them had enough incomes, while 78.3% had family history to diabetes & development of gestational diabetes. Higher percentage of GDW (60%) had polyhydramnios. The total mean score of knowledge pre educational intervention was 20.2±0.4, it improved to become 36.4±5.5 post intervention. There was a highly statistical significant difference between pre& post educational intervention regarding to all attitude scale factors among studied GD women. There was a highly statistical significant relationship between pre-post educational interventions regarding the total and all self-care activities subscales related to gestational diabetes. Conclusion: The educational nursing intervention played positive effect in improving the knowledge, attitude & self-care activities of controlled uncomplicated gestational diabetic women after three months of follow up by correction of their recognition about the disease consequences. Recommendation: awareness program for educating the pregnant women about GDM risk factors, self management activities & complications.**

*Keywords:* **Gestational Diabetes, knowledge, attitude, self-care activities & nursing intervention.**

## 1. INTRODUCTION

Gestational diabetes mellitus (GDM) can be defined as carbohydrate intolerance of varying severity first recognized during pregnancy. This definition can include women with previously undiagnosed diabetes as well as those who become transiently hyperglycemic as a result of pregnancy-induced insulin resistance. Diabetes is a complex, chronic illness requiring continuous medical care with multifactorial risk-reduction strategies beyond glycemic control. Ongoing patient self-management educations along with support are critical to preventing acute complications and reducing the risk of long-term complications. Significant evidence exists that supports a range of interventions to improve diabetes outcomes (WHO, 2014).

The prevalence of high blood glucose in pregnancy (GDM) increases rapidly especially among women over the age of 35 years. There were an estimated 204 million women worldwide had GDM. This number is projected to increase to 308 million by 2045. There were about 21.3 million or 16.2% of live births had some form of hyperglycemia in pregnancy, that were due to gestational diabetes .One to seven births was affected by gestational diabetes. The vast majority of cases of hyperglycemia in pregnancy were in low-and middle-income countries, where access to maternal care is often limited (International Diabetes Federation, 2015).

The rate of gestational diabetes among pregnant women in Egypt is affect between 2-14% of all pregnancies, and that it occurs during that period due to the resistance of hormones produced by the placenta to the work of insulin. Occurs in the last months of pregnancy, a temporary sugar that disappears after birth, but in some rare cases continue after the birth, especially if the type that requires treatment with insulin (Khalil, Fathy and Mahmoud, 2017).

It is still unclear what causes gestational diabetes. During pregnancy GDM is may be caused by the action of pregnancy hormones, the placenta excretes hormones which help the baby to grow and develop. Some of these hormones block the action of the mother's insulin which is called insulin resistance. This prevents cells to take glucose properly. This causes glucose to remain in blood and it continues to rise (Bower, 2010).

The main consequences of gestational diabetes mellitus include spontaneous abortions and major congenital anomalies may be induced in the first trimester. Excessive fetal growth, neonatal hypoglycemia, jaundice, polycythemia and stillbirth may occur during the second and third trimesters. Infants born to mothers with GDM are at risk of being both large for gestational age and increase the risk of instrumental deliveries and caesarean section or obstructions during vaginal delivery (Al-Nsour, 2017).

Knowledge is an important component of health concept's shaping. Studies show that inadequate knowledge about the disease leads to poor understanding of medical information. This leads to limited adherence to management strategies and ultimately unfavorable pregnancy outcome. Numerous cultural factors also play a very important role in health-seeking behavior, especially amongst pregnant women (Al Habashneh, 2010).

Attitude is a psychological concept reflect a mental and emotional entity or characterizes a person, it is a complex and an acquired state through experiences. The attitude correction take up of the pregnant women which lies in turning influences of the participants into action (self-care activities), this process depends mainly upon provide subjects with the correct information about the disorder and its management (Brown, 2014).

The pregnant women attitude towards the gestational diabetes could directly affect their perception of the need for special training, the way they compliance with diabetes, the way they magnitude the short term and long term complications, and their attitude affect their autonomy in the treatment and their style or channels while communicate with the medical care team, and finally their evaluation about the seriousness of the disease (Bond, 2012).

Gestational diabetes self-care includes a range of activities (e.g., self-monitoring of blood glucose, eating a low-saturated-fat diet, and checking one's feet). Self-care behaviors are less common in women with gestational diabetes, which could be indicative of inadequate educational programs offered at the public health centers and diabetes clinics. One constant reason of this failure is lack of attention to the etiological studies and their foundation regardless of social cognitive theories, known as conceptual frame-work, in educational planning (Dolatian & Majd, 2014).

In order to change or maintain healthcare behaviors, such as self-care, medical teams should have sufficient information about influential factors of the learning process, which leads to behavioral modifications. The related educational effort could enhance the knowledge of health-care professionals in this regard (Barati, 2014).

Community health nurse provide pregnant women with appropriate information aimed to increase and correct their knowledge also to empower women with diabetes to have a positive attitude, by advice and support that will help them to reduce the risks of adverse pregnancy outcomes for mother, baby and prevent the complications of disease by proper management of disease. Health care professionals' strategies and abilities can influence positive behavioral changes and self-care activities in gestational diabetic women (Nezhad, Maghbooli, Vassigh and Larijani, 2016).

## 1.1. Significant of the study:

According to IDF Report,(2015), 20.9 million (16.2%) live births were affected by hyperglycemia in pregnancy and an estimated 85.1% of those cases were due to gestational diabetes, 7.4% due to other types of diabetes first detected in pregnancy and 7.5% due to diabetes detected prior to pregnancy (International Diabetes Federation, 2015)

Women with GDM are up to six times more likely to develop type 2 diabetes than women with normal glucose tolerance in pregnancy. Children of women with GDM are more likely to be obese and have diabetes in childhood and early adulthood (Hossein-Nezhad and Maghbooli , 2007) .The consequences of GD represents the most common metabolic complications of pregnancy, and fetal morbidities. Moreover, women with GDM have a considerably elevated risk for impaired glucose tolerance (IGT) and type 2 diabetes in the years following pregnancy (Kim , Newton & Knopp , 2002).

Unfortunately, due to insufficient focus on prevention and lack of preconception planning, several challenges relating to maternal healthcare still remain. Lack of access to care and financial issues are some barriers to utilization of health care, in addition health literacy is also becoming a growing. To overcome those barriers by improving the knowledge, correction of the attitude and promote the self-care skills, that help the women to comprehend and adopt a healthy lifestyles (Duman,2015) .

**1.2. Purpose of the study:**

The purpose of the present study was to assess the effect of nursing intervention on knowledge attitude and self-care activities, among gestational diabetic women.

**1.3. Hypotheses:**

• Gestational diabetic women who will receive the nursing intervention will have a higher knowledge score post intervention than pre intervention.

• Gestational diabetic women who will receive the nursing intervention will have a positive attitudes post intervention than pre intervention.

• Gestational diabetic women who will receive the nursing intervention will have a better self-care activities post intervention than pre intervention.

## 2. SUBJECTS AND METHODS

**2.1. Research design:**

A quasi-experimental (pre & post) research design was used to achieve the aim of this study.

**2.2. Research setting:**

A multistage random technique was used to select the study setting according to following system: The first stage was a random selection of one district from nine districts in Menoufia Governorate. The selected district was Shebin Elkom district. The second stage was a random selection of two MCH centers from Shebin Elkom MCH centers. The selected MCH centers were MCH named kebly and Meet-khakan in which the sample was taken.

**2.3. Sample:**

A purposive sample of 60 pregnant women with gestational diabetes for 3 months duration, who registered in pregnancy follow up files as diabetic pregnant high risk cases were recruited and they were willing to participate and complete the study. Gestational diabetic women who assumed attending the previous MCH centers for health care and follow up were selected according to:

*Inclusion criteria:*

- Pregnant women who are controlled gestational diabetes for medication.

- Pregnant women with diagnosed gestational age from 24-28 weeks (According to (CDC, 2016) it reported that, gestational diabetes usually develops during the second or third trimester of pregnancy. Certain hormones released at that time work against the action of insulin and cause insulin resistance).

- Gestational diabetic women who accept to participate in the study.

*Exclusion criteria:*

- Diabetic pregnant women suffering from any other disorders e.g. diabetes, asthma, epilepsy, hypertension, thyroid dysfunction, anemia or heart problems, respiratory, and renal diseases.

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- Pregnant women who had gynecological viral infection.

- Pregnant women who are at high risk pregnancy other than GD(e.g, preeclampsia, erythroblastosis fetalis (fetal abnormalities), abnormal quantities of amniotic fluids, abnormal bleeding, placenta previa, and multiple pregnancy.

**2.4. Study Instruments:**

**Instrument I: Structured interviewing questionnaire:** This questionnaire was designed and used by the researchers after an extensive review of literature and discussion with the experts to collect data about the subjects it is developed by the researcher which contained the following parts:

Part one: it included questions related to socio-demographic data such as name, age, level of education, occupation, number of children, and rate of monthly income.

Part two: This part included questions that cover the past and current family and medical history of pregnant women under study as current previous history of GD, the past and current obstetric health status of pregnant women under study as number of children, number of abortion, gestational age.

Part three : This part included questions that cover the knowledge of pregnant women related to gestational diabetes as description of GD, characteristic of diabetic diet, factors that increase risk for GD, follow up schedule for GD women.

Scoring System: The questionnaire contained, items related to the GDM women' demographic criteria as well as 20 women' knowledge assessment items each was two points Liker scale (1 – 2) as (1) for "no" answer& (2) for "yes" answer, and. The questionnaire was evaluated giving a score of 20 - 40. The total score of each woman was categorized arbitrary into "poor knowledge" when the mother achieved less than or equal $\leq 50\%$ of the total score , and "Good knowledge" was considered when the mother achieved more than $> 50\%$ of the total. Accordingly, if the total knowledge score of a woman was "20 – 30", she was classified as had poor knowledge, and if the total knowledge score of a woman was "31 – 40", she was classified as had good knowledge.

**Instrument II: Diabetic Attitude Scale-Version 3 (DAS-3):** This scale is developed by Anderson, Fitzgerald, Funnell, Gruppen, (1998), to measure attitudes of pregnant women regarding gestational diabetes. In this scale there are 33 items comprising seven subscales. Attitudes to GDM are measured in five subscales including: Need for special training to provide GDM care, attitude towards patient compliance, seriousness of non-insulin-Dependent, blood glucose control and complications, impact of diabetes on patients' lives, attitude towards patient autonomy and attitudes towards team care.

Scoring System of gestational diabetes attitude: Concerning attitude of women , it was studied in a list of 30 items, divided into seven subscales, each item was two points Liker scale (1 – 2) as (1) for " no agree", and (2) for " yes agree". The questionnaire was evaluated giving a score of 30 - 60. The total score of each woman was categorized arbitrary into "good attitude" when the woman achieved more than or equal $\geq 50\%$ of the total score , and "negative attitude" was considered when the mother achieved less than $< 50\%$ of the total score. Accordingly, if the total attitude score of a woman was "30 – 45", she was classified as had a negative attitude, and if the total attitude score of a woman was "46 – 60", she was classified as had a positive attitude.

**Instrument III: Summary of Self-Care Diabetes Activities (SDSCA):** It developed by Toobert, Hampson and Glasgow,(2000). The Summary of Self-Care Diabetes Activities (SDSCA) is a self-report instrument measures level of diabetes self-care across different components of the diabetes regimen. The most recent revised version of the SDSCA questionnaire, based on studies, has been reduced to 18 items, which could be utilized to address specific self-care questions included: Following specific diet regimen that designed before by a dietician. Domestic self-measurement of blood glucose level. Enhance health related practices to avoid GD risks. Practice safe exercise/ physical activity to the GDW regularly. Taking medication regularly. Respondents are asked to circle how many days in the past seven days they displayed a diabetes-specific behaviors/ activities. Responses with higher scores indicating better performance of self-care activities.

Scoring system for summary of Self-Care Diabetes Activities:

Regarding self-care activities of women, it was studied in a list of 18 items, each was two points Liker scale (1 – 2) as (1) for "no", and (2) for "yes". The questionnaire was evaluated giving score of 18 – 36. The total score of each woman was

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categorized arbitrary into "good activities" when the woman achieved more than or equal ≥ 50% of the total score, and "poor activities" was considered when the woman achieved less than <50% of the total score. Accordingly, if the total activities score of a mother was "18 – 28", she was classified as had poor self-care activities, and if the total activities score of a woman was "29 – 36", she was classified as had good self-care activities.

### 2.5. Validity and reliability of the instruments:

validity of the study instruments (II-III) were tested for their content by a jury of five experts in the field of family and community health nursing and medical surgical nursing to ascertain relevance and completeness of the instruments and the needed modifications were done. Reliability of these instruments (II-III) was tested by the researcher (test- retest) for the internal consistency by administration of the same tool to the same participants after two weeks and compares the results.

### 2.6 Pilot study:

It is conducted on 8(10%) pregnant women of the study sample to assess the feasibility of the study as well as clarity and objectivity of the tools. The needed modifications will be incorporated and those subjects will be excluded from the actual study.

### 2.7 Ethical considerations:

• Approval of Ethical Research Committee (ERC) that obtained from Faculty of Nursing at Menoufia University. Oral consent obtained from all study's participants.

• Confidentiality of the information was assured through anonymous of the questionnaire and interviewing the study's subjects individually in assessment phase.

### 2.8. Data collection procedure:

Data collection for this study was extended from the first of November to the end of March 2018.

All women who are registered for antenatal care clinic are diagnosed using fasting blood glucose level during their first antenatal visit (first trimester or early second trimester). Values above 5.8 mmol/l indicates a full glucose tolerance test. Further screening is carried out between 24 and 28 gestation weeks for women with risk factor/s for GDM according to the American Diabetes Association (ADA, 2015).

Women who participanted in the intervention group received self-care education on diabetes in four sessions (one session per week) along with routine prenatal care. The sessions were held in the form of lectures and question and answer. Each participant was provided with a booklet at the end of the first session. The definition of diabetes, causes, symptoms, treatment and prevention of complications of the disease with the emphasis on self- care management items including proper nutrition, physical activity, medication regimen ,follow up schedule, domestic blood glucose level control and usage of insulin pens were the content of the educational booklet. The educational sessions were in groups of 7 to 14 participants.

The core of the educational material which prepared was to increase the knowledge of the women and to helping them in controlling their gestational diabetes, and to give them the map for the patient diet, medication, activities & to help them to increase the self- care level as well as improve attitude toward GDM.

The duration of the session will be between 30 to 45 minutes with regard to the subjects and their health conditions and needs.

The educational sessions conducted in the form of interview the pregnant women in groups with the prepared educational materials like posters, educational videos and presentation by data show and making an illustrated booklet for GDM and brochures, it focused on updated diabetic guidelines according to The American diabetic association standardized guidelines, 2016)

Group discussions and demonstration between the community researcher and studied women were used to educate the subjects. The researchers gave the women a diet map developed by nutrition doctor who follow the MCH center containing variety of integrated diabetic meals to make them more excited.

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Arrange physical activity and effort schedule taking into account the safety of the pregnant woman, also topics about the available resources (insulin pens, medication prescriptions, blood glucose test strips &the importance of follow up during and after pregnancy, the feasibility to access the health needs, the skills and finally the consequences of the disease are discussed to magnitude the benefits of the intervention to the subjects.

Finally after three months after the end of intervention, the effect of educational intervention on the promotion of the women knowledge level, self-care activities & diabetes attitude were measured in post intervention. An interview was done with the participants to explain the purpose of the study and its importance after gaining the approval from the scientific ethical committee from faculty of nursing, Menoufia University and MCH managers.

The base line assessment data (pretest) was collected form the participated women and filling the questionnaire at the selected MCH centers. The educational intervention was adjusted over 12 weeks and the educational session performed after filling the questionnaire and study scales. It contained self- care activities, knowledge and attitude toward GDM. The duration of each session will be flexible between 30 to 45 minutes with regard to the subject's health conditions and their educational level.

Having completed the questionnaires, the data was analyzed. Then, the educational objectives and contents was adjusted in three parts (recognition; to explain the disease nature, causes, and short-long term complications), (attitude; to correct the current attitude of the subjects towards their illness and correction of the false, wrong beliefs) and (self-care activities; to change the bad habits and behaviors & follow the directions).

During the period of data collection (starting from intervention till collection the post intervention data) the researcher followed the continuation of diabetic guidelines and instructions communication to pregnant women by phone (one time /month). Finally, three months after the end of intervention, the impact of educational intervention on the promotion of patients' self-care behaviors & diabetes control were measured.

**2.9. Statistical Analysis:**

Data was coded and transformed into specially designed form to be suitable for computer entry process. Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 22. Graphics were done using Excel program. Quantitative data as age were presented by mean (X) and standard deviation (SD). Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square ($\chi$2) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used( if the table was 4 cells) , or Likelihood Ratio (LR) test (if the table was more than 4 cells). Level of significance was set as P value <0.05 for all significant tests.
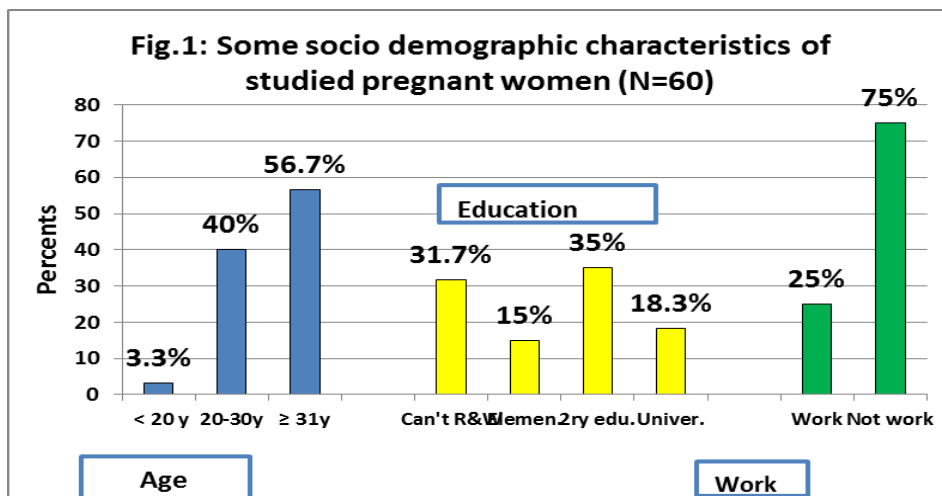
# 3. RESULTS



**Figure 1: demonstrated that more than half of the studied pregnant women with gestational diabetes (56.7%) their ages were 31 years and more. More than one third of them (35%) were not complete their education (secondary education only). Three quarters (75.0%) of the studied pregnant women were not working .Three quarters (75%) of studied pregnant women their incomes were enough.**

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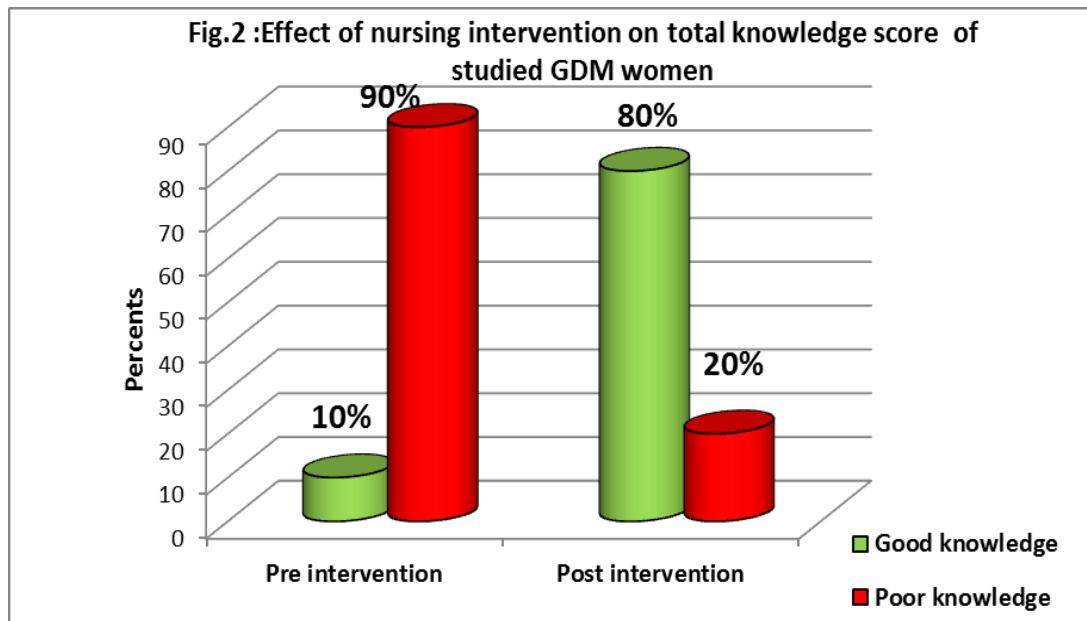
**Figure 2: showed that the total knowledge score of GDW was 10% had good knowledge score pre intervention , it improved to become 80%post nursing intervention (P=0.000 ).**

**Table 1: Effect of nursing intervention on the extent of self-care activities among studied GDM women (n=60).**

| Self-care activities items | Intervention | | | | P value |
|---|---|---|---|---|---|
| | Pre N0. | % | post N0. | % | |
| **1: Follow diet plan developed by a nutritionist** | | | | | |
| **Eat the number of meals allowed** | | | | | |
| Yes | 3 | 5 | 48 | 80 | $\chi2$= 63.3,    P=0.000  HS |
| No | 57 | 95 | 12 | 20 | |
| **Have a plan designed by a nutritionist** | | | | | |
| Yes | 2 | 3.3 | 45 | 75 | $\chi2$= 42.4,    P=0.000  HS |
| No | 58 | 96.7 | 15 | 25 | |
| **Go to the grocery store with the list of permitted foods** | | | | | |
| Yes | 3 | 5 | 45 | 75 | $\chi2$= 42.4,    P=0.000  HS |
| No | 57 | 95 | 15 | 25 | |
| **Eat low-sodium food, sugar and fat** | | | | | |
| Yes | 7 | 11.7 | 43 | 71.7 | $\chi2$= 64.7,    P=0.000  HS |
| No | 53 | 88.3 | 17 | 28.3 | |
| **II.    Home sugar measurement** | | | | | |
| **Measure blood sugar as prescribed to you** | | | | | |
| Yes | 11 | 18.3 | 30 | 66.7 | $\chi2$= 52.1,    P=0.000  HS |
| No | 49 | 81.7 | 20 | 33.3 | |
| **Own a measuring instrument at home** | | | | | |
| Yes | 7 | 11.7 | 30 | 66.7 | $\chi2$= 52.1,    P=0.000  HS |
| No | 53 | 88.3 | 20 | 33.3 | |
| **Measure the blood sugar as the times that are recommended** | | | | | |
| Yes | 3 | 5 | 32 | 53.3 | $\chi2$= 29.3,    P=0.000  HS |
| No | 57 | 95 | 28 | 46.7 | |
| **Trained to use the device to measure yourself** | | | | | |
| Yes | 4 | 6.7 | 31 | 51.7 | $\chi2$= 26.6 ,   P=0.000  HS |
| No | 56 | 93.3 | 29 | 48.3 | |
| **Total** | **60** | **100** | **60** | **100** | |

HS=highly significant

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Table 1: illustrated that there were highly significant differences between pre-post nursing interventions regarding to studied gestational diabetic women self-care activities except the point of measure blood sugar as prescribed to them.

**Table 2: Effect of nursing intervention on the extent of self-care activities (Practice Exercise regularly, and take medication regularly among studied GDM women (n=60).**

| Self-care activities items | Nursing Intervention | | | | P- value |
|---|---|---|---|---|---|
| | Pre | | post | | |
| | N0. | % | N0. | % | |
| **III. Practice Exercise regularly** | | | | | |
| **Do you practice in a health club under the supervision of specialists** | | | | | |
| Yes | 13 | 21.7 | 44 | 73.3 | $\chi 2$=31.8,   P=0.000  HS |
| No | 47 | 78.3 | 16 | 26.7 | |
| **Do you just walk from time to time** | | | | | |
| Yes | 4 | 6.7 | 18 | 30 | $\chi 2$=10.7,      P=0.001 Sig. |
| No | 56 | 93.3 | 42 | 70 | |
| **Do you exercise regularly more than 3-5 times a week** | | | | | |
| Yes | 4 | 6.7 | 44 | 73.3 | $\chi 2$=55.1,   P=0.000  HS |
| No | 56 | 93.3 | 16 | 26.7 | |
| **IV. Take medication regularly** | | | | | |
| **Do you take medication regularly as the doctor decides to you** | | | | | |
| Yes | 12 | 20 | 59 | 98.3 | $\chi 2$=71.4,   P=0.000  HS |
| No | 48 | 80 | 1 | 1.7 | |
| **Total** | 60 | 100 | 60 | 100 | |

Table 2: showed that there were highly statistical significant differences between pre-post nursing intervention regarding to studied gestational diabetic women self-care activities (practice exercise regularly).
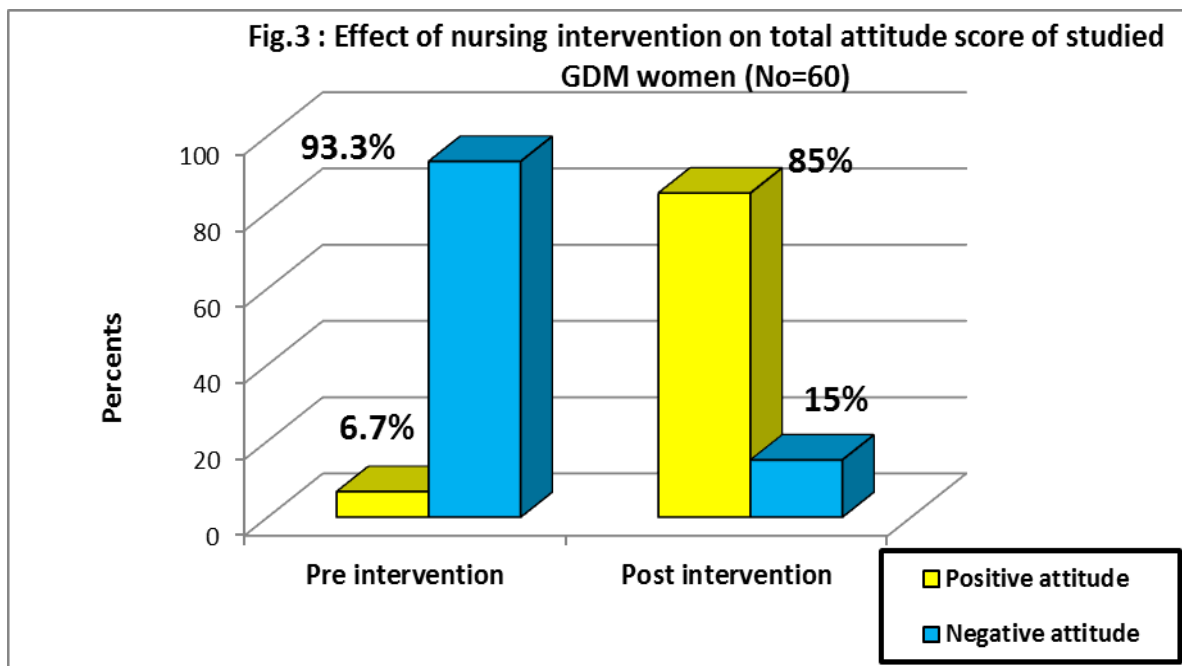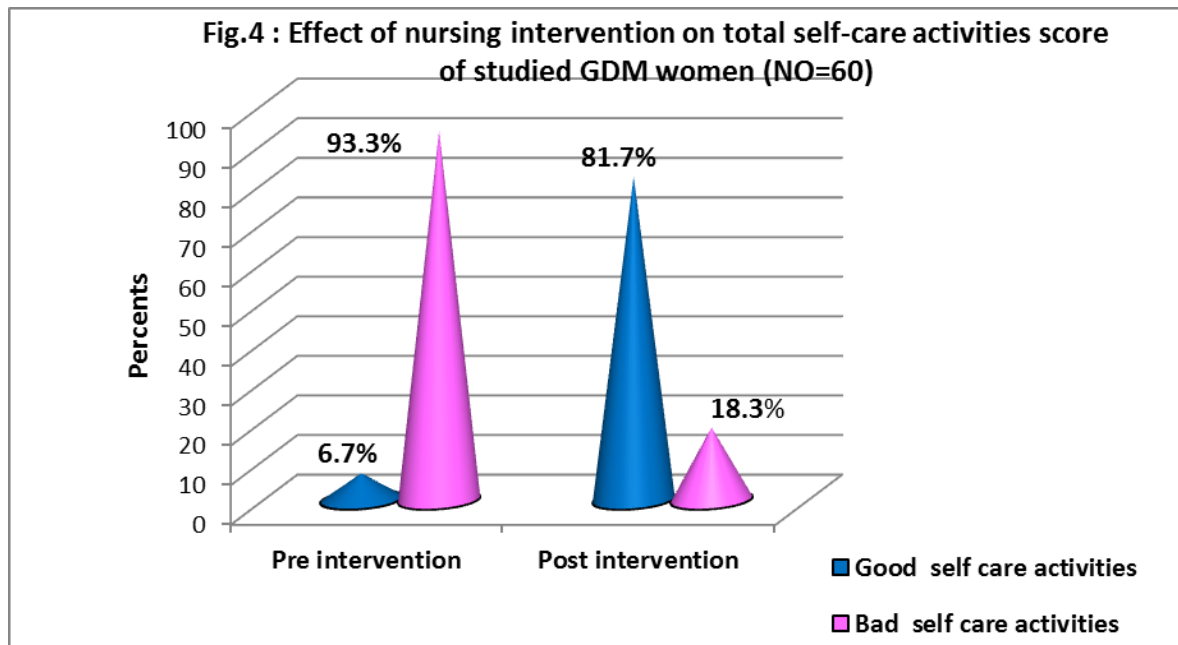


**Figure 3: showed that the effect of educational nursing intervention on total attitude score among studied GDM women. They reported that most of GDW under study (93.3%) had a negative attitude toward gestational diabetes pre intervention .This percent decreased to become (15%) only post intervention. Reversely, most of GDW under study (6.7%) had a positive attitude toward gestational diabetes. This percent improved to become (85%) post intervention.**

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Figure 4: showed that the effect of nursing intervention on total self-care activities score of studied GDM women .They reported that most of GDW under study (93.3%) had a bad self-care toward gestational diabetes pre intervention .This percent decreased to become (11%) only post intervention. Reversely, most of GDW under study (6.7%) had a positive attitude toward gestational diabetes .This percent improved to become (81.7%) post intervention.

## 4.  DISCUSSION

Hyperglycemia during pregnancy negatively influences fetal development leading to adverse perinatal outcome. Adequate and good knowledge and teaching self- care about GDM among antenatal women will lead to changes to adopt healthy lifestyle, better healthcare-seeking pattern, better self-care, and thus prevention and early diagnosis of the disease, thereby reducing the prevalence of GDM, improving pregnancy and neonatal outcomes and also the economy of the country (Polly, 2012).

The results of the present study illustrated that, more than half of the pregnant women with gestational diabetes (56.7%) their ages were 35 years and more. This was consistent with Abu-Qamar, (2014), who observed that the age plays important role in getting gestational diabetes and reported that about 86.8% of women in GDM group were over 25 years. No woman under the age of 20 years was found in the cases.

Regarding to education, the present study showed that, the higher percentage of GDW can't read and write while the lower percentage of them was among elementary school education. This was in line with Khan, Ali, &Khan (2013) who reported that, women with primary school education had an increased risk of GDM compared to women of a higher educational level. On the other hand in Egypt at Menoufia Governorate, Khalil et al., (2017) reported that, the higher percentage of GDW under study was among secondary school education.

The current study illustrated that there were statistical significant improvement between pre-post nursing interventions regarding studied GDW knowledge about gestational diabetes. Ten percent of pregnant women had poor knowledge about GDM pre-intervention; it improved to become 80% post nursing intervention. This result was consistent with study of Al-Akour, (2013) who stated that the post-intervention score for knowledge about the gestational diabetes increased than pre intervention which can influence the promotion of self-care, attitude and disease control later. A significant increase in level of knowledge after intervention over all knowledge components as gestational diabetes management, control, diagnosis, Physical activity benefits, diabetes main types, wound care, importance of healthy food, complication of gestational diabetes, signs and symptoms of gestational diabetes, insulin reaction.

Health training is one of the most efficient methods of intervention for prevention of disease, because they contribute to enhancement and maintenance of health due to improving health-related behaviors. On the other hand women with

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gestational diabetes (GD) are at higher risk of developing type 2 diabetes (DM), after delivery compared to those without GD. The present study intends to answer the question "Does offering health training for pregnant women affects their preventive behaviors against gestational diabetes (Hjelm, Berntrop, Frid, Aberg & Apelqvist, (2011)..

Pregnant women's beliefs and attitudes varied with cultural background and also that specific cultural beliefs impacted on self-care activities and adherence to GDM treatment plans. Differences in attitudes and beliefs were noted in between high cultural differences groups according to Hjelm etal., 2011)

Less serious understanding of diabetes has been extensively linked to poorer self-care activities, this study clearly indicates a strong link between attitude and diabetes related self-care activities. While, Gatt and Sammut, (2016), found that beliefs and attitudes impacted on the way in which women intended to self- manage their GD while Al-Khawaldeh, Al-Hassan, and Froelicher, (2012), found that women who believed that gestational diabetes would not seriously affect their lives, were less likely to adhere to treatment plans.

Effect of on total self-care score activity among the studied women showed an improvement from 6.7% (bad self-care activities) pre-intervention to 81.7% post-intervention into a good self-care activities &practice in which every woman used her knowledge, skills and power as a source to independently take care of her health. The benefits of self-care education in diabetes and other chronic diseases have been significantly proven. In general self-care is affected by attitudes, resources, personal beliefs and community culture in which one lives. This was consistent with the current study which has shown that lack of awareness, lack of correct information about the disease, and lack of patients' skill can prevent the condition improvement and cause poorer self-care activities.

According to Gatt and Sammut (2016) self-care education was implemented in the educational sessions. After three months of completion of the intervention, the results showed the positive effect of self-care educational program on the self -care activities. In the study of Albikawi, Petro-Nustas, and Abuadas, (2016) the quality of life of people increased after receiving self-care education compared to before the education. Also, in a study conducted by Aljasem, (2016) the results proved that the educational approach has a potential to improve self-care activities within their all dimensions in first following a diet or a specific diet plan, eating the number of meals which are allowed, eating low-sodium food, sugar and fat, second improve home sugar measuring (they follow times of measuring as prescribed, some of them buy instruments or devices to the domestic usage, they show high training progress), women show noticeable attention to their weight especially those with family history of diabetes.

## 5. CONCLUSION

**5.1-** The educational intervention played positive effect in improving the knowledge, attitude & self-care activities of controlled uncomplicated gestational diabetic women.

**5.2-** A significant association was observed between the educational intervention which was given to pregnant women and the knowledge, self-care activities & their attitude regarding gestational diabetes.

**5.3-** The educational intervention was designed to working over the perceived knowledge among gestational diabetic women which could affect easily the attitude intention, which consequently also could lead to enhanced self-care behaviors among women with gestational diabetes.

## 6. RECOMMENDATIONS

- Awareness program for educating the pregnant women about GDM risk factors & complications.

- Screening program to discover high risk groups for GDM and pregnant women with positive family history to diabetes for early management and follow up.

- Establishing the self-care activities and GDM-related behaviors for teaching pregnant women.

- It is important for health professionals including nurses to develop educational strategies that address both with lower health literacy and cultural variation.

- Activate the role of health education in family health centers.

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