Effect of Instructional Package on Knowledge and Self-care Practices among Gestational Diabetic Women

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Abstract

Background: Gestational diabetes defined as abnormal glucose metabolism with the first recognition during pregnancy and usually resolves after the birth. **Aim of the study** to evaluate the effect of instructional package on knowledge and self-care practices among gestational diabetic women. **Research design:** A quasi-experimental study design (one group) was used to fulfill the aim of study. **Research setting:** This study was conducted at obstetrics and gynecological outpatient clinic and Obstetrics and Gynecological department in Benha University hospital. **Study subjects:** A purposive sample of 64 pregnant women medically diagnosed with gestational diabetes. **Tools of data collection:** Three tools were used for data collection: **Tool (I):** A structured interviewing questionnaire sheet, **Tool (II):** Maternal knowledge questionnaire, **Tool (III**): Diabetic Self-Care Practices questionnaire. **Results:** There was a highly statistical significant difference between the result of the post intervention and follow up phases compared with pre intervention about knowledge and self-care practices regarding gestational diabetes. **Conclusion:** There was a marked improvement in pregnant women' total knowledge and self-care practices regarding gestational diabetes after implementation of the instructional package. **Recommendations:** Development of a training program and evidence based interventions to provide a better view of the women health promotion strategies related to gestational diabetes.

Keywords: Gestational diabetes, Instructional package, Knowledge, Self-care practices.

Introduction

Gestational diabetes Mellitus (GDM) is a type of diabetes in which a woman without diabetes develops high blood sugar levels during pregnancy. It is a serious pregnancy disorder which affects pregnant women and first diagnosed in the second or third trimester of pregnancy and resolves postnatal **(Abdel-Moaty et al., 2023).** GDM occurs during the second and third trimester due to insulin resistance that has resulted from hormone production by the placenta or reduced production of insulin **(Mohamady et al., 2022).** Risk factors of gestational diabetes mellitus include overweight/obesity, advanced maternal age > 30 years, pre-gestational obesity or excessive weight gain during pregnancy, family history of insulin resistance or diabetes, increase age at marriage and increase age at 1st child, high parity and polycystic ovarian syndrome causes an increased risk of hyperglycemia in pregnant women **(Mohamady et al., 2022).**

Concerning diagnosis, all pregnant women regardless of risk factors should be screened for gestational diabetes toward the end of the second trimester between 24th and 28th weeks of gestation. While, women with risk factors for GDM should be screened earlier in pregnancy.

Typically, gestational diabetes screening and diagnosis occur between 24–28 gestational weeks **(Mahmoodi et al., 2020)**. Screening for GDM should be completed for all women more specifically women that are at risk according to the predisposing factors must be screened early. GDM is generally diagnosed with an oral glucose tolerance test (OGTT) result, which administered at 24–28 weeks' gestation or as early as possible for high-risk women **(Abdel-Moaty et al., 2023)**

Concerning **maternal complications**, women with gestational diabetes are at subsequent high risk of type 2 diabetes, preeclampsia, premature membrane rupture, preterm delivery and polyhydramnios **(Osman et al., 2022)**. Concerning **fetal complications,** GD is associated with adverse pregnancy outcomes such as preterm birth, macrosomia, birth injury (shoulder dystocia with its attendant risks of brachial plexus injury and clavicle fracture), neonatal hypoglycemia, respiratory distress, congenital anomalies and fetal malformation. The above risks can be minimized with good glycemic control and judicious obstetric and midwifery care **(Tora and Vahitha, 2021)**.

Gestational diabetes mellitus is treated with pharmacological therapy, medical nutritional therapy, self-care practices changes, glycemic monitoring, fetal monitoring by ultrasound and planning on delivery. Pharmacological therapy and medications include insulin, metformin and glyburide. Insulin is the first-line agent recommended for treatment of gestational diabetes and has been demonstrated to improve perinatal outcomes. Insulin should be added if needed to achieve glycemic targets. Insulin is the preferred medication for treating hyperglycemia in gestational diabetes mellitus **(Tarry et al., 2019).**

Major diabetic self-care practices include a healthy diet, being physically active, antenatal care blood glucose monitoring, medication compliance, checking cholesterol levels, taking care of kidneys and losing weight. These health practices are associated with good glycemic control, reducing long-term complication and improvement in quality of life **(George et al., 2021)**.

Nurses have a major part of GDM management as the maternity nurse's key role during antenatal period is preventing and reducing complications as much as possible by educating gestational diabetic women about diet regimen, exercise self-monitoring and insulin treatment to decrease morbidity and mortality rates. Maternity nurses should empower high risk women by raising their awareness, giving advice and support to decrease the risks of adverse perinatal outcomes. Health education plays an important role in increasing women's awareness regarding the GDM risk and its proper management, in order to reduce maternal and fetal complications **(Mohamady et al., 2022).**

Significance of the study:

The GDM prevalence is continually rising worldwide. It becomes one of the major public health problems and becomes a global public health burden. It was estimated that 21.3 million births (16.2%) worldwide were affected by hyperglycemia in pregnancy and 86.4% of these, were due to GDM **(Abdel-Moaty et al., 2023).** According to the most recent **International Diabetes Federation IDF**, Egypt is among the world's top 10 countries in the total number of patients with diabetes. The prevalence of GDM in Egypt increases from 8 to 24.2 %. Egypt, like most other nations, has a wide range of GDM prevalence reports. The frequency of GDM was determined to be 8% in 250 pregnant women who visited a rural family health clinic in Egypt **(Osman et al., 2022)**.

Aim of the Study:

The study aimed to evaluate the effect of instructional package on knowledge and self-

care practices among gestational diabetic women.

Study Hypotheses:

H1: Implementation of instructional package would improve knowledge of the pregnant women regarding gestational diabetes.

H2: Implementation of instructional package would improve self-care practices of the pregnant women regarding gestational diabetes.

Subjects & Method:

Research design: A quasi-experimental study design (one group: time series quasi experimental design) was used to fulfill the aim of study.

Setting: This study was conducted at obstetrics and gynecological outpatient clinic and Obstetrics and Gynecological department in Benha University hospital.

Sample type: A purposive sample was used to achieve the aim of the study.

Sample size: All pregnant women diagnosed with gestational diabetes and attained to the pre-mentioned setting for 9 months (64 women) according to following inclusion criteria: Pregnant women medically diagnosed with GD and gestational age during the second and third trimester of pregnancy between24-28 weeks.

Tools of data collection:

Three tools were used in this study:

Tool (I): A structured interviewing questionnaire: This tool was constructed by the researchers in Arabic language based on reviewing the related literatures. It comprised two main parts:

Part 1: **Socio demographic characteristics** of the pregnant women consisted of closed ended questions (5 items) such as (age, residence, level of education and occupation).

Part 2: Obstetric history: It consisted of closed and open ended questions (4 items) such as; gestational age, gravidity, parity, previous history of gestational diabetes and family history of gestational diabetes.

Tool II: **Maternal knowledge questionnaire**:

This tool was constructed by the researchers in Arabic language based on reviewing the related literatures **(El-Ansary & Fouad, 2020) and (Eigenmann et al., 2011)** to assess knowledge of pregnant women related to gestational diabetes mellitus. It consisted of (15 questions).

Scoring system: All knowledge variables were weight according to items included in each question. The answer of the questions was classified into two categories. The answer had score (2) for correct answer and score (1) for incorrect answer. **Total knowledge score was classified as the following:**

- Adequate ≥ 60%.
- In adequate < 60%.

Tool III: Diabetic Self- Care Practices Questionnaire: It was a self-report questionnaire. This tool was constructed by the researchers in Arabic language based on reviewing the related literatures **(El-Ansary & Fouad, 2020) and (Toobert et al., 2000).** It was a self-report questionnaire used to assess pregnant women' self-care practices regarding GD. It consisted of (20 items) grouped under (5) categories including: **Category (1):** Pregnant women' self-care practices regarding following the diet plan, **Category (2):** Pregnant women' self-care practices regarding checking of blood glucose at home, **Category (3):** Pregnant women' self-care practices regarding taking medications regularly and following the movement of the fetus, **Category (4):** Pregnant women' self-care practices regarding regular exercise training and monitoring weight and **Category (5):** Pregnant women' self-care practices regarding personal hygiene and skin care.

Scoring system: All practices variables were weighted according to items included. The answer calculated as: (2) for "done" and (1) for "not done." **Total self-related practices score classified as the following:**

- Satisfactory level ≥ 60% .

- Unsatisfied level < 60%.

Administrative approval:

An official approval was obtained from Dean of Faculty of Nursing in Benha University to director of Benha University Hospital affiliated to Ministry of High Education. A clear explanation was given about the nature, importance and expected outcomes of the study to carry out the study with minimal resistance.

Content validity:

Tools of data collection were investigated for content validity by panel of three jury experts in the field of Obstetrics and Gynecological Nursing at Benha University to judge clarity, relevance, comprehensiveness, understanding and applicability of tools. All of their remarks were taken into considerations and the tools were considered valid from the experts' point of view.

Reliability of the tools:

Reliability for tools was applied by the researchers for testing the internal consistency of the tools by administrating of the same tool to the same subjects under similar condition. Internal consistency reliability of all items of the tools was assessed using Cronbach's alpha coefficient test. The internal consistency of knowledge was 0.88 and self-care practice was 0.90.

Ethical considerations:

Approval of the Faculty Ethical Committee for Scientific Research was obtained for the fulfillment of the study. An official permission from the selected study settings was obtained for the fulfillment of the study. The aim of the study was explained to all pregnant women before applying the tools to gain confidence and trust. Oral consent was obtained from pregnant women to participate in the study and confidentiality was assured. The data was collected and treated confidentially. The study hadn't any physical or psychological risk of the women and freedom to withdrawal at any time of data collection and with no obligation.

Pilot study:

The pilot study was conducted on 10% of the total duration of data collection (4 weeks- 8 pregnant women). In order to test applicability of the constructed tools, the clarity of the included questions and the time needed for each subject to fill the questions. According to the results of the pilot study, required modifications were done. Women involved in the pilot excluded from the study to avoid contamination of the sample.

Field work:

Interviewing and assessment phase: At the beginning of the interview the researchers introduced herself to each pregnant woman and greeted the pregnant woman included in the study, explained the purpose of the study to the participants and provided the women with all information about the study (purpose, duration and activities), feedback about the study and take oral consent. Then the researchers distributed tool **I** for collecting data. **Tool II:** Maternal knowledge questionnaire, **tool III**: Diabetic Self-Care Practices Questionnaire. Average time for the completion of each woman interview was around (45-60 minutes). The number of interviewing women ranged from 3-4 women per week.

Planning phase: Based on baseline data obtained from assessment phase and relevant review of literature. The researchers designed 3 sessions regarding GD, one theoretical for knowledge and two practical for practices. The number of sessions and its contents, different methods of teaching and instructional media were determined and explained to the participants. The contents of instructional package were prepared according to the pregnant women level of understanding in simple, organized and scientific Arabic language.

Implementation phase: The researchers attended the previous mentioned study setting

and provided appropriate separate place for the pregnant women during the interview. The researchers designed the instructional package to improve women's knowledge and self-care practices regarding GDM. At the beginning of the first session pregnant women were oriented with the program contents. The women were interviewed in small groups by the researchers to implement the instructional package regarding gestational diabetes. The number of women participated in each session were 3-4 pregnant woman. The researchers used teaching methods such as lectures, discussion, role model, demonstration and re-demonstration and suitable teaching media included booklet, posters, figures and videos in laptop. The booklet about GD and its management which constructed by the researchers in simple Arabic language to suit level of understanding and satisfy the studied pregnant women's deficit knowledge and practices regarding GDM. The researchers applied the instructional package through 3 sessions over 3 weeks. The duration of each session was (45-60) minutes according to women's achievement and feedback. The sessions conducted for small groups and each group involved 3-4 pregnant women. The researchers discussed sessions as following:

The first session: At the beginning of the first theoretical session the researchers gave the pregnant woman the handout (booklet) and introduced an orientation of the booklet including the general and specific objectives. Then the researchers provided studied women with knowledge about G.D.M and its management including concept of gestational diabetes, risk factors, causes, symptoms of gestational diabetes, symptoms of hypoglycemia, diagnosis, investigations, maternal and fetal complications, guidelines for treating GD, pharmacological therapy of GD, proper nutrition, importance of practicing exercise and importance of follow up schedule during pregnancy and postpartum period.

The second session: It is a practical session included self-care practices as following diet plan developed by a dietitian, checking of blood glucose and urine glucose at home and exercise training and monitoring weight.

The third session: It is also a practical session that included self-care practices as taking medications regularly and following the movement of the fetus and personal hygiene and skin care

Evaluation phase: The evaluation phase emphasized on determining the effect of instructional package on knowledge and self-care practices of pregnant women regarding GD by comparing the results pre, post and follow-up implementation. Post-test was done after two weeks of intervention from the last session and follow up test was done after one month to evaluate the effectiveness of the instructional package. At almost time the researchers followed women via telephone.

Statistical analysis:

Data was verified prior to computerized entry. The Statistical Package for Social Sciences (SPSS version 22.0) was used for that purpose, followed by data tabulation and analysis. Descriptive statistics were applied (e.g., mean, standard deviation, frequency and percentages). Test of significance (Friedman test, chi-square) as well as person correlation coefficient was used to investigate relation between study variables. Degrees of significance of results were considered as follows: P-value > 0.05 Not significant (NS), P-value ≤ 0.05 Significant (S) and P-value ≤ 0.001 Highly Significant.

Results:

Table (1): It was cleared that (60.9%) of studied sample were in age group > 30 years. More than half (51.6%) of them lived in rural areas. Moreover, (76.6%) were housewives and (54.7%) of them had secondary education.

Table (2) illustrates that (73.4%) and (68.8) of the studied sample were multigravida and multipara respectively. The mean

gestational age of them was (26.031 ±1.943) weeks, (82.8%) of them had no previous history of GD and (85.9%) of the studied sample had no family history of GD.

Table (3) shows that, there was a marked improvement in knowledge of studied sample regarding GD after implementation of the instructional package with a highly statistical significant difference ($p<0.001$) at pre, 2 weeks post and one-month post-intervention phases.

Figure (1) displays that, (21.9%), (82.8%) and (81.8%) of studied sample had adequate knowledge regarding gestational diabetes at pre, 2 weeks post and one-month post-intervention phases respectively. While, it was revealed that (78.1%), (17.2%) and (18.8%) of them had inadequate knowledge regarding GD at pre, 2 weeks post and one-month post-intervention phases respectively.

Figure (2) displays that, (12.5%), (79.7%) and (78.1%) of studied sample had satisfactory level of self-care practices regarding gestational diabetes at Pre, 2 weeks and one-month post-intervention phases respectively. While, it was revealed that (87.5%), (20.3%) and (21.9%) of them had unsatisfactory level of self-care practices regarding gestational diabetes at Pre, 2 weeks and one-month post-intervention phases respectively

Table (4) reveals that, there was a marked improvement in self-care practices of studied sample regarding gestational diabetes after implementation of the instructional package with a highly statistical significant difference ($p<0.001$) at pre, 2 weeks post and one-months post-intervention phases.

Table (5) clarifies that, there was a statistically significant relation between total knowledge score regarding gestational diabetes and (educational level and occupation) of the studied sample at pre-intervention phase ($p \leq 0.05$). While, there was no statistically significant relation between total knowledge score and socio-demographic data of the studied sample at 2 weeks and one-months post-intervention phases ($P> 0.05$).

Table (6) clarifies that, there was a statistically significant relation between total self-care practices score regarding gestational diabetes and only (educational level) of the studied sample at pre-intervention phase ($p \leq 0.05$). While, there was no statistically significant relation between total self-care practices score and socio-demographic data of the studied sample at 2 weeks and one-month post-intervention phases ($P> 0.05$).

Table (7) clarifies that; there was a highly statistical significant positive correlation between total knowledge and total self-care practices scores regarding gestational diabetes at 2 weeks and one-month post-intervention phases ($P\leq 0.001$).

Table (1): Distribution of the studied sample according to their Socio-demographic characteristics (n=64).

Socio-demographic characteristics	No.	%
Age:		
<20	8	12.5
20 – 30	17	26.6
>30	39	**60.9**
Mean ± SD = 26.02±7.57		
Residence:		
Rural	33	**51.6**
Urban	31	48.4
Level of education:		
Read/write	7	10.9
Secondary education	35	**54.7**
University education	22	34.4
Occupation:		
Housewife	49	**76.6**
Working	15	23.4

Table (2): Distribution of the studied sample regarding their obstetric history (n=64).

Obstetric history	No.	%
gestational age in weeks:		
Mean ± SD = 26.031 ±1.943		
Gravida:		
Primigravida	17	26.6
Multigravida	47	**73.4**
Parity:		
Nulliparous	17	26.6
Primipara	3	4.7
Multipara	44	**68.8**
Previous history of gestational diabetes:		
Yes	11	17.2
No	53	**82.8**
Family history of gestational diabetes:		
Yes	9	14.1
No	55	**85.9**

Table (3): Distribution of studied sample regarding their knowledge about gestational diabetes at Pre, 2 weeks and one-month post-intervention phases (n=64).

Knowledge items	Pre-intervention		2 weeks post-intervention		One-month post-intervention		Friedman test	
	Correct answer	Incorrect answer	Correct answer	Incorrect answer	Correct answer	Incorrect answer	X2	P-value
	No. %	No. %	No. %	No. %	No. %	No. %		
Concept of gestational diabetes	19 29.7	45 70.3	43 67.2	21 32.8	41 64.1	23 35.9	44.33	**0.000****
Risk factors of gestational diabetes	14 21.9	50 78.1	41 64.1	23 35.9	41 64.1	23 35.9	54.00	**0.000****
Causes of gestational diabetes	12 18.8	52 81.3	39 60.9	25 39.1	38 59.4	26 40.6	50.07	**0.000****
Symptoms of gestational diabetes	25 39.1	39 60.9	55 85.9	9 14.1	53 82.8	11 17.2	56.26	**0.000****
Symptoms of hypoglycemia	8 12.5	56 87.5	35 54.7	29 45.3	40 62.5	24 37.5	55.56	**0.000****
Diagnosis of gestational diabetes	13 20.3	51 79.7	40 62.5	24 37.5	39 60.9	25 39.1	52.07	**0.000****
Most important investigations for a woman with gestational diabetes	18 28.1	46 71.9	35 54.7	29 45.3	36 56.3	28 43.8	34.11	**0.000****
Maternal complications of gestational diabetes	22 34.4	42 65.6	51 79.7	13 20.3	50 78.1	14 21.9	56.06	**0.000****
Fetal complications of gestational diabetes	16 25.0	48 75.0	40 62.5	24 37.5	40 62.5	24 37.5	48.00	**0.000****
Guidelines for treating gestational diabetes	17 26.6	47 73.4	44 68.8	20 31.3	42 65.6	22 34.4	50.29	**0.000****
Pharmacological therapy of gestational diabetes	20 31.3	44 68.8	54 84.4	10 15.6	53 82.8	11 17.2	66.05	**0.000****
Proper nutrition for pregnant women with gestational diabetes	19 29.7	45 70.3	42 65.6	22 34.4	43 67.2	21 32.8	46.08	**0.000****
Importance of practicing exercise	7 10.9	57 89.1	30 46.9	34 53.1	29 45.3	35 54.7	44.08	**0.000****
Importance of follow-up schedule during pregnancy	23 35.9	41 64.1	53 82.8	11 17.2	51 79.7	13 20.3	56.26	**0.000****
Importance of follow-up schedule during postpartum	14 21.9	50 78.1	28 43.8	36 56.3	27 42.2	37 57.8	26.14	**0.000****

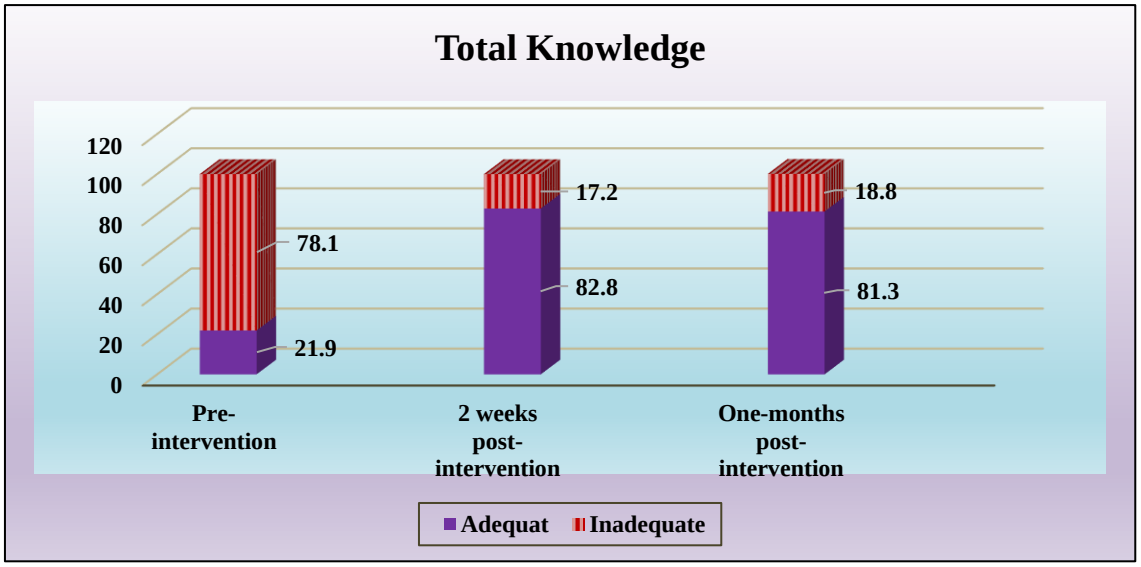

Figure (1): Percentage distribution of studied sample regarding their total knowledge score about gestational diabetes at Pre, 2 weeks and one-month post-intervention phases (n=64).

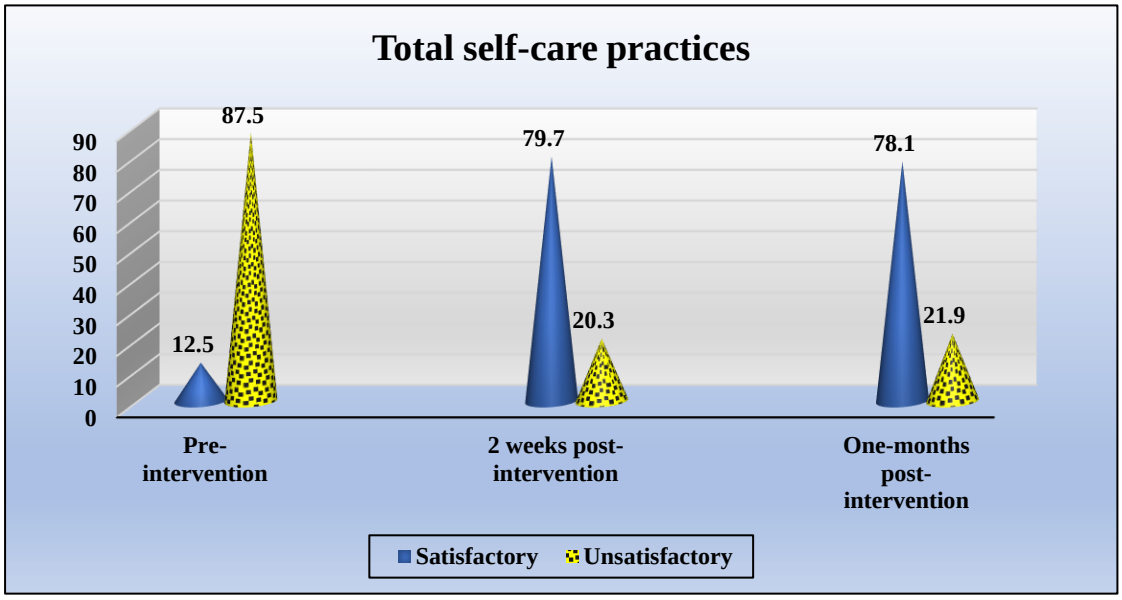

Figure (2): Percentage distribution of studied sample regarding their total self-care practices about gestational diabetes at Pre, 2 weeks and one-month post-intervention phases (n=64).

Table (4): Distribution of studied sample regarding their self-care practices about gestational diabetes at Pre, 2 weeks and one-month post-intervention phases (n=64).

Practices items	Pre-intervention		2 weeks post-intervention		One-month post-intervention		Friedman test	
	Done	Not done	Done	Not done	Done	Not done	X2	P-value
	No. %	No. %	No. %	No. %	No. %	No. %		
Following the diet plan:								
Eat the allowed number of meals (breakfast, lunch &dinner daily).	12 18.8	52 81.3	39 60.9	25 39.1	40 62.5	24 37.5	54.07	0.000**
Have a plan designed for a diet defined by a nutritionist.	8 12.5	56 87.5	31 48.4	33 51.6	29 45.3	35 54.7	42.34	0.000**
Eat foods low in sodium and fat.	15 23.4	49 76.6	46 71.9	18 28.1	45 70.3	19 29.7	60.06	0.000**
Eat a variety of meals that contain vitamins, mineral and low carbohydrate.	11 17.2	53 82.8	50 78.1	14 21.9	50 78.1	14 21.9	78.00	0.000**
Avoid consuming sugars and soft drinks.	14 21.9	50 78.1	37 57.8	27 42.2	36 56.3	28 43.8	44.08	0.000**
Avoid eating canned foods or fast food that contain a large amount of sodium	17 26.6	47 73.4	38 59.4	26 40.6	36 56.3	28 43.8	38.38	0.000**
Checking blood glucose at home:								
Monitoring blood glucose level at home.	10 15.6	54 84.4	38 59.4	26 40.6	40 62.5	24 37.5	58.25	0.000**
Trained to use a blood glucose meter on yourself.	8 12.5	56 87.5	32 50.0	32 50.0	33 51.6	31 48.4	48.08	0.000**
Measuring the blood sugar level according to the doctor's orders	13 20.3	51 79.7	44 68.8	20 31.3	43 67.2	21 32.8	60.06	0.000**
Training on how to perform glucose analysis in urine.	11 17.2	53 82.8	39 60.9	25 39.1	42 65.6	22 34.4	56.58	0.000**
Taking medications regularly and monitoring the movement of the fetus:								
Taking medications regularly as prescribed by doctor and monitoring side effects.	22 34.4	42 65.6	54 84.4	10 15.6	56 87.5	8 12.5	64.23	0.000**
Avoid taking medication without consulting a doctor	18 28.1	46 71.9	48 75.0	16 25.0	43 67.2	21 32.8	51.66	0.000**
Monitoring the fetal kicks daily.	21 32.8	43 67.2	55 85.9	91 4.1	57 89.1	7 10.9	68.22	0.000**
Regular exercise training and weight gain control:								
Walking daily at least half an hour.	6 9.4	58 90.6	37 57.8	27 42.2	39 60.9	25 39.1	62.24	0.000**
Exercising regularly 3-5 times per week.	3 4.7	61 95.3	24 37.5	40 62.5	21 32.8	43 67.2	36.85	0.000**
Getting enough sleep daily	13 20.3	51 79.7	46 71.9	18 28.1	44 68.8	203 1.3	62.24	0.000**
Weighing yourself every week.	5 7.8	59 92.2	31 48.4	33 51.6	30 46.9	34 53.1	50.07	0.000**
Personal hygiene and skin care:								
Caring for feet and skin regularly and cutting nails gently.	18 28.1	46 71.9	35 54.7	29 45.3	36 56.3	28 43.8	34.11	**0.000****
Oral hygiene and brushing teeth daily.	25 39.1	39 60.9	55 85.9	9 14.1	53 82.8	11 17.2	56.26	**0.000****
Caring for the genital area constantly.	23 35.9	41 64.1	53 82.8	11 17.2	51 79.7	13 20.3	56.26	**0.000****

Table (5): Relation between socio-demographic data of the studied sample and total knowledge score regarding gestational diabetes at Pre, 2 weeks and one-month post-intervention phases (n=64).

Socio-demographic data	Total knowledge											
	Pre-intervention				2 weeks post-intervention				one-month post-intervention			
	Adequate (n=14) No. %	Inadequate (n=50) No. %	Chi - square test	P-value	Adequate (n=53) No. %	Inadequate (n=11) No. %	Chi-square test	P-value	Adequate (n=52) No. %	Inadequate (n=12) No. %	Chi-square test	P-value
Age												
<20	3 (21.4)	5 10.0	**1.363**	**0.506**	6 11.3	21 8.2	**2.173**	**0.337**	6 11.5	2 16.7	**0.750**	**0.687**
20 – 30	3 (21.4)	14 28.0			16 30.2	1 9.1			13 25.0	4 33.3		
>30	8 (57.2)	31 62.0			31 58.5	8 72.7			33 63.5	6 50.0		
Residence:												
Rural	8 57.1	25 50.0	**.223**	**0.636**	28 52.8	5 45.5	**0.198**	**0.656**	25 48.1	8 66.7	**1.349**	**0.245**
Urban	6 42.9	25 50.0			25 47.2	6 54.5			27 51.9	4 33.3		
Educational level:												
Read/write	1 7.2	6 12.0	**11.018**	**0.004 ***	5 9.4	2 18.2	**0.860**	**0.651**	5 9.6	2 16.7	**0.857**	**0.652**
Middle education	3 21.4	32 64.0			30 56.6	5 45.4			28 53.9	7 58.3		
University education	10 71.4	12 24.0			18 34.0	4 36.4			19 36.5	3 25.0		
Occupation:												
Housewife	7 50.0	42 84.0	**7.046**	**0.008 ***	41 77.4	8 72.7	**0.109**	**0.741**	39 75.0	10 83.3	**0.377**	**0.539**
Working	7 50.0	8 16.0			12 22.6	3 27.3			13 25.0	21 6.7		

*A Statistical significant $p \leq 0.05$ **A Highly Statistical significant $p \leq 0.001$

Table (6): Relation between socio-demographic data of the studied sample and total self-care practices score regarding gestational diabetes at Pre, 2 weeks and one-month post-intervention phases (n=64).

Socio-demographic data	Total self-care practices											
	Pre-intervention				2 weeks post-intervention				one-month post-intervention			
	Satisfactory (n=8) No. %	Unsatisfactory (n=56) No. %	Chi - square test	P-value	Satisfactory (n=51) No. %	Unsatisfactory (n=13) No. %	Chi-square test	P-value	Satisfactory (n=50) No. %	Unsatisfactory (n=14) No. %	Chi-square test	P-value
Age												
<20	2 25.0	6 10.7	**1.331**	**0.514**	7 13.7	1 7.7	**0.560**	**0.75**	5 10.0	3 21.4	**1.522**	**0.467**
20 – 30	2 25.0	15 26.8			14 27.5	3 23.1			13 26.0	4 28.6		
>30	4 50.0	35 62.5			30 58.8	9 69.2			32 64.0	7 50.0		
Residence:												
Rural	5 62.5	28 50.0	**0.438**	**0.508**	29 56.9	4 30.8	**2.824**	**0.093**	26 52.0	7 50.0	**0.018**	**0.895**
Urban	3 37.5	28 50.0			22 43.1	9 69.2			24 48.0	7 50.0		
Educational level:												
Read/write	1 12.5	6 10.7	**7.386**	**0.025 ***	6 11.8	1 7.7	**2.742**	**0.254**	4 8.0	3 21.4	**2.271**	**0.321**
Middle education	1 12.5	34 60.7			30 58.8	5 38.5			29 58.0	6 42.9		
University education	6 75.0	16 28.6			15 29.4	7 53.8			17 34.0	5 35.7		
Occupation:												
Housewife	6 75.0	43 76.8	**0.012**	**0.911**	40 78.4	9 69.2	**0.489**	**0.485**	40 80.0	9 64.3	**1.505**	**0.220**
Working	2 25.0	13 23.2			11 21.6	4 30.8			10 20.0	5 35.7		

*A Statistical significant $p \leq 0.05$ **A Highly Statistical significant $p \leq 0.001$

Table (7): Correlation between total knowledge and total self-care practices scores of the studied sample regarding gestational diabetes at Pre, 2 weeks and one-month post-intervention phases (n=64).

Variables	Total knowledge					
	Pre-intervention		2 weeks post-intervention		One-month post-intervention	
	r	P-value	r	P-value	R	P-value
Total self-care practices	0.559	0.000**	0.613	.000**	0. 647	0.000**

**A Highly Statistical significant $p \leq 0.001$

Discussion

Gestational Diabetes Mellitus is a global disorder and one of the most common medical complications that affect pregnancy. GDM is a type of diabetes defined as any degree of glucose intolerance or abnormal glucose metabolism with the onset or first recognition during pregnancy and usually resolves after the birth of the baby **(Abdel-Moaty et al., 2023)**.

The finding of the present study revealed that more than three fifth of studied pregnant women were in age group > 30 years old, with a mean age of 26.02±7.57 years. This result was in accordance with **Saboula et al., (2018)** who conducted "Effect of Nursing Intervention on knowledge, Attitude and Self-Care Activities among Gestational Diabetic Women" and found that, more than half of the studied pregnant women with gestational diabetes their ages were 31years and more. From the researchers point of view, similarity of the finding may be due to incidence of GDM was especially high in women who were older than 30 years. This also could be due to the correlation between the age and the risk of GDM. Meanwhile, this result disagreed with **Osman et al., (2022)** who conducted "Effect of Intervention PRECEDE Model on Knowledge and Practice of Preventive Behaviors among High-Risk Pregnant Women regarding Gestational Diabetes" and found that, the majority of pregnant women their ages ranged from 18 < 30 years with a mean ± SD of 23.14 ± 4.68.

As regards the residence, the finding of the present study revealed that more than half of the studied pregnant women lived in rural areas. The rational of this result might because pregnant women living in rural areas visit the government hospitals as they are benefitted by the State scheme, while pregnant women residing in the urban areas prefer to go for ante-natal check-ups in private nursing homes/clinics owing to the crowd and prolonged waiting hours. This result was in accordance with **Abdel-Moaty et al., (2023)** who studied "Effect of Tele-nursing Guidelines on Knowledge among Women with Gestational Diabetes during COVID-19 Pandemic" and revealed that, above half of the studied pregnant women belonged to rural area. Moreover, this result disagreed with **Mohamady et al., (2022)** who studied "Effect of Counseling Program based on Health Literacy Model regarding Gestational Diabetes on Maternal and Fetal outcomes" and found that, more than half of them lived in urban area.

In relation to the educational level, the finding of the present study revealed that more than half of the studied pregnant women had secondary education. This result might be due to

most Egyptian mothers preferred to stay at home to take care of their husbands and children rather than complete their education. This result was in the same line with **Byakwaga et al., (2021)** who conducted a study entitled "Level of and factors associated with awareness of gestational diabetes mellitus among pregnant women attending antenatal care" and found tha,t less than two-thirds of the studied pregnant women were secondary education. On the other hand, this result wasn't in the same harmony with **Saboula et al., (2018)** who showed that, the higher percentage of GDW can't read and write while the lower percentage of them was among secondary school education.

Regarding occupation, the finding of the present study revealed that more than three-quarters of the studied pregnant women were housewives and nearly one quarter of them were employee. This result could be explained due to natural of area of residence where the majority of them live in rural area and more than half of the studied pregnant women have middle education, which leads to decrease their work opportunities. This result was similar to **Mohamady et al., (2022)** who found that less than two thirds of the studied pregnant women were housewife.

Pertaining to obstetric history of the studied pregnant women, the finding of the present study revealed that less than three-quarters were multigravida and more than two-thirds of the studied pregnant women were multipara. The mean gestational age of them was (26.031 ±1.943) weeks. Additionally, the more than three quarters of the studied pregnant women had no previous history of gestational diabetes. This result was in accordance with **Abdelmonem et al., (2022)** who conducted a study entitled "Effect of Health Belief Model based Educational Package on Lifestyle among Gestational Diabetic Women" and found that the mean gestational age was 28.7±2.4 among the studied group and more than half of the pregnant women were multipara. On the other hand, this result was in disagreement with **Barani et al., (2021)** who conducted "A Study to assess the knowledge regarding Gestational Diabetes Mellitus among antenatal mothers" and found that about 68% of mothers have primigravida and 28% multigravida and 4% of grand multipara.

Concerning the family history of gestational diabetes, the finding of the present study revealed that the majority of the studied pregnant women were no family history of gestational diabetes. This result was in the same line with **Abdel-Moaty et al., (2023)** who revealed that, less than one-third of the studied women have a family history of the gestational diabetes. Meanwhile, this result was opposite to **Tora and Vahitha, (2021)** who studied "Effect of structured teaching programme on knowledge regarding self-care management of gestational diabetes mellitus among gestational diabetic women" and found that nearly two thirds of mothers had family history of diabetes and nearly one third had no such history.

The finding of the present study also revealed that there was a marked improvement in knowledge of studied pregnant women regarding gestational diabetes after implementation of the instructional package with a highly statistical significant difference ($p<0.001$) between pre, 2 weeks post and one-month post-intervention phases. From the researchers point of view, this significant improvement is very valuable because acquisition of accurate knowledge is considered the basis for pregnant women with gestational diabetes and linked to better self-care practices but the women need follow up for some time to change their behaviors and make correct decisions. This result was in accordance with **El-Ansary & Fouad, (2020)** who conducted "Effect of Educational Sessions on Knowledge,

Attitude and Self-Care Practices among Pregnant Women with Gestational Diabetes" and illustrated that, nearly two thirds of the pregnant women had poor knowledge regarding gestational diabetes before intervention whereas the majority of them and more than three quarters had good knowledge immediately and two weeks post intervention respectively.

Also, there was a highly statistically significant difference regarding pregnant women total knowledge about gestational diabetes pre and post intervention ($p < 0.001$) whereas knowledge had been markedly increased post intervention. This result was also in agreement with **Abd Elsalam et al., (2021)** who studied "Educational program about GDM during pregnancy at Assiut City" and reported a statistically significant difference between knowledge scores pre and post the educational interventions. Additionally, this result was supported by **Abd Elmoaty et al., (2019)** who studied "Effect of Educational Program for recently diagnosed Gestational Diabetic Women on their Knowledge and clinical outcomes" reported that the majority of gestational diabetic women had good knowledge in immediate and post 3 months respectively as compared in pre-educational program with highly statistically significance differences. This result was in accordance with **Saboula et al., (2018)** who conducted concluded a significant increase in the total knowledge score of gestational diabetic women post-intervention. Similar finding was reported in a quasi-experimental study by **Mohamed & Ahmed, (2019)** to assess the "effect of educational program for health literacy among pregnant women with gestational diabetes" and reported a statistical significant difference between knowledge score pre and post the educational program. Also, this result was also similar to **Osman et al., (2022)** who revealed that there was an increase in the mean score of knowledge, enabling, and reinforcing factors scores with statistical significance immediately and after one month of educational intervention.

As regards pregnant women's self-care practices toward gestational diabetes, the present study revealed that, there was a marked improvement in self-care practices of studied pregnant women regarding gestational diabetes after implementation of the instructional package with a highly statistical significant difference ($p<0.001$) between pre intervention, 2 weeks post and one-months post-intervention phases. These findings may be attributed to the healthy educational sessions and most women of the sample were committed with the guidelines. Also, this change in women's practices might be due to proper education which increase their awareness and improve their healthy behaviors.

This result was in agreement with **El-Ansary & Fouad, (2020)** who revealed that most of pregnant women had bad self-care practices toward gestational diabetes pre intervention and decreased to become 9.3% four weeks post intervention. There was highly statistically significant difference ($p<0.001$). Also the result was similar to **Mohamady et al., (2022)** who studied "Effect of Counseling Program based revealed that the majority of studied women had adequate knowledge and satisfactory self-care practice immediately post counseling program compared to preprogram with high statistically significant difference between pre and post program. This may be due to the mothers' interest in acquiring new information and skills to prevent complications for them or their neonates.

Additionally, this result was in accordance with **Saboula et al., (2018)** who reported that most of GDW under study had bad self-care practices toward gestational diabetes pre intervention. This percent decreased to become (11%) only post intervention. Also, there were highly statistical significant differences between pre-post nursing intervention regarding to

studied gestational diabetic women self-care activities. Increasingly, this result was supported with **El-Nagar et al., (2019)** who conducted "Effect of Implementation of Health Educational Guidelines on Maternal and Neonatal Outcomes among Women with Gestational Diabetes Mellitus" and revealed that the majority of the study group had unsatisfactory level of self-care measures before health education sessions compared to more than three quarters of the control group. Whereas, after the health education sessions more than three quarters of women among the study group experienced satisfactory level of self-care measures regarding most of the studied items.

Concerning relations, the finding of the present study clarified that, there was a statistically significant relation between total knowledge scores regarding gestational diabetes and (educational level and occupation) of the studied pregnant women at pre-intervention phase ($p \leq 0.05$). While, there was no statistically significant relations between total (knowledge scores and self-care practices scores) and socio-demographic data of the studied pregnant women at 2 weeks and one-months post-intervention phases ($P > 0.05$). This result was at the same line with **Abdel-Moaty et al., (2023)** who revealed that there was no significant relation between total satisfactory knowledge level of women with GDM and their demographic characteristics in post intervention phase at ($p => 0.05$).

Also, this result was also in accordance with **Abd Elmoaty et al., (2019)** who reported that there were statistically significance relationship between total knowledge scores of gestational diabetic women pre-educational program and their educational level and there is non-statistical relation between the socio-demographic characteristic in the same study at post educational program.

Concerning correlation between total knowledge and total self-care practices of the studied pregnant women at pre, 2 weeks and one-month post-intervention phases, the present study finding revealed that there was a highly statistical significant positive correlation between total knowledge and total self-care practices scores. This result was in the same line with **El-Ansary & Fouad, (2020)** who revealed a positive correlation between pregnant women's total attitude and total self-care practices scores post intervention. Also this result was supported with **El-Nagar et al., (2019)** who found a strong correlation between total knowledge and self-care measures scores difference after health education sessions regarding GDM with a statistically significant difference.

Additionally, the result was similar to **Mohamady et al., (2022)** who revealed that a high statistically significant correlation between knowledge, attitudes and self-care practices and counseling based on health literacy model pre and immediately post program.

Conclusion:

Based on the findings of the present study, it was concluded that, there was a marked improvement in pregnant women' total knowledge and self-care practices regarding gestational diabetes after implementation of the instructional package with a highly statistical significant difference ($p<0.001$) at pre, 2 weeks post and one-months post-intervention phases. There was a highly statistical significant positive correlation between total knowledge and total self-care practices regarding gestational diabetes at 2 weeks and one-month post-intervention phases ($P \leq 0.001$). Hence the aim of the study was achieved and research hypotheses were accepted.

Recommendations:

- Applying instructional package and counseling tips in gestational diabetic women discharge

teaching plan to maintain healthy life style and maximum glycemic control prior to a future conception.

- Investigating the impact of gestational diabetes educational program on women's quality of life.
- Training courses and workshops about gestational diabetes care and management for health care providers (maternity nurses) at antenatal clinics should be conducted at regular intervals.

Further research: Future researches are needed on large probability sample at different settings to generalize the results.

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تأثير الحزمة التعليمية على معلومات وممارسات الرعاية الذاتية بين السيدات المصابات بسكر الحمل

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مرض سكر الحمل هو نوع من أنواع مرض السكر الذي يحدث خلال فترة الحمل في الثلث الثاني أو الثالث عادة بعد 24 أسبوع نتيجة لمقاومة الهرمونات التى تفرزها المشيمة لعمل الأنسولين. الهدف: تقييم تأثير الحزمة االتعليمية على معلومات وممارسات الرعاية الذاتية بين السيدات المصابات بسكر الحمل. تصميم الدراسة: دراسة شبه تجريبية تم استخدامها لتحقيق هدف الدراسة (مجموعة واحدة). مكان الدراسة: تم اجراء هذه الدراسة في العيادات الخارجية لأمراض النساء والتوليد وقسم النساء والتوليد في مستشفى جامعة بنها. العينة: عينة هادفة من 64 امرأة حامل تم تشخيصهن طبيا بسكر الحمل في الدراسة. أدوات جمع البيانات: تم استخدام ثلاثة أدوات لجمع البيانات: الأداة الأولى: استبيان المقابلة الشخصية، الأداة الثانية: استمارة تقييم معلومات السيدات الحوامل فيما يتعلق بسكر الحمل، الأداة الثالثة: استمارة تقييم ممارسات الرعاية الذاتية لدي السيدات الحوامل المصابات بسكر الحمل. النتائج: كان هناك فرق ذو دلالة إحصائية عالية بين نتائج الاختبارالبعدي والمتابعة مقارنة بالاختبارالقبلي للمعلومات و ممارسات الرعاية الذاتية فيما يتعلق بسكرالحمل. الخلاصة: كان هناك تحسن ملحوظ في المعلومات و ممارسات الرعاية الذاتية للسيدات فيما يتعلق بسكر الحمل بعد تطبيق الحزمة التعليمية. التوصيات : تطوير برنامج تدريبي وتدخلات قائمة على الأدلة لتقديم رؤية أفضل لاستراتيجيات تعزيز صحة السيدات المتعلقة بسكر الحمل.