Women's Compliance with Post- Partum Glucose Screening

Eltoukhy, E*, Abu-shabana K., Mohamed R, **, Mahmoud H****

* BSc of Nursing from British University in Egypt.
** Professor of Maternity and Gynecology Nursing
** Professor of Maternity and Gynecology Nursing
**Lecturer of Maternity and Gynecology Nursing

Abstract

Aim: To assess women's compliance with post- partum glucose screening. **Design**: A descriptive study design was used. **Setting**: The study was conducted at post-natal units at Ain Shams maternity university hospital. **Sampling**: A purposive sampling was used to recruit 360 women. **Tool of data collection:** A structured interviewing questionnaire named "mother's knowledge regarding post-partum glucose screening and Barriers affecting women's compliance with post- partum glucose screening" was used. **Results**: 59.2% among studied sample had incorrect total knowledge regarding post-partum glucose screening (PPGS). Moreover, 75% of studied sample did not comply with (PPGS). Hence, 78.6% of women had "health team's factors as a reason for non-compliance with postpartum glucose screening test; followed by the second factor which represented 65.0% of women had women's factors as barriers for adherence with postpartum glucose screening test. there were highly statistically significant moderate positive correlation between total studied sample knowledge regarding gestational diabetes during pregnancy, postpartum glucose screening of the studied women's and their total score of factors affecting their compliance with post-partum glucose screening (p -value<0.001)**Conclusion:** The present study findings concluded that more than half of studied sample had in-correct total knowledge regarding PPGS. The majority of studied sample did not comply with PPGS. More than three quarter of studied sample had a health team factors as the most prominent reason which prevented them to comply with the screening test. **Recommendations**: Design and implement motivational guideline for gestational diabetic women to improve their compliance with PPGS.

Keywords: compliance, post-partum glucose screening.

Introduction:

Gestational diabetes mellitus (GDM) represents a pathological condition for the mother and the fetus during pregnancy, at delivery and in the follow-up period. Prevalence varies in the different countries. Women with GDM have an increased risk of adverse obstetric events and adverse neonatal outcomes compared to women with physiological pregnancy, including fetal macrosomia, shoulder dystocia, neonatal trauma, neonatal jaundice, respiratory distress, and neonatal hypoglycemia **(Napoli et al., 2021).**

GDM is also associated with an increased risk of dysglycemia and type 2 diabetes development after delivery compared to normal pregnancy. Women with gestational diabetes have a 7–12 times higher risk of developing type 2 diabetes compared to women with normoglycemic pregnancy. Recent evidence underlines the importance of early identification of GDM and its subsequent treatment to promote maternal–fetal health. The 'Guideline on physiological pregnancy'' was developed to disseminate specific recommendation on GDM, describing screening and diagnostic procedures. A selective screening, based on the presence of specific risk factors, is recommended after the exclusion of overt diabetes; this guideline also recommends a follow-up OGTT to be performed not before 6 weeks from the delivery **(Goueslard et al., 2017).**

Screening for diabetes following an index GDM pregnancy is in general reported to be low. Depending on the definition of

'postpartum diabetes screening' including the type of test and follow-up period, studies identified in this review – all from the US or Australia – found postpartum diabetes screening rates ranging from 19 to 73%. Studies that have assessed the frequency of postpartum screening over time show that the proportion of women with GDM completing a postpartum screening test has increased; thus between 1999 and 2004 found that the proportion of women with confirmed GDM who completed a postpartum screening test within 3 months increased from 9 to 58% in their research setting in north-west US (Cade**, Polyakov & Brennecke, 2019).**

Compliance to screening tests was sub-optimal, but little information is available on what factors influence poor compliance and thereby identify what can be done to improve it. While women express commitment and motivation for treatment to protect their health and thereby the health of the unborn baby, behavior changes and compliance to treatment are associated with challenges and a number of barriers have been identified, particularly in the qualitative studies. Also postpartum screening for diabetes is unsatisfactory and a number of determinants and barriers have been identified, including patients being lost to follow-up, lack of time and lost requisition **(Liu et al., 2019).**

Following a recent GDM pregnancy many women desire and intend to maintain healthy lifestyles to prevent future diabetes but find the effort challenging. Self-efficacy and social support are important determinants in this regard. Understanding determinants and barriers within the local context is vital in designing public health interventions to address the growing burden of GDM and diabetes. Therefore, studies from low- and middle-income countries where the prevalence of GDM is rapidly increasing are especially warranted **(Liu, 2018)**.

Maternity nurses play a key role in promoting woman health and preventing many kinds of disease after delivery so, they need to take a more proactive approach to postpartum follow up care plan. According to ACOG recommendations in order to optimize compliance to postpartum glucose screening maternity nurse should follow anticipatory guidance which should begin during pregnancy and with development of a postpartum care plan that addresses the transition to parenthood. Moreover, all women should ideally have contact with maternity care within the first 3 weeks postpartum **(ACOG, 2018).**

Significant of the Study:

The International Diabetes Federation (IDF) expected that 21.4 million or 16.8% of live births to women had a various form of hyperglycemia in pregnancy- Gestational Diabetes mellitus (GDM) affects approximately 7% of pregnancy worldwide. In Egypt, according to a recent study which was screening for incidence of GDM with total number of 250 subjects, the incidence was 1 among 8 women had GDM, (**Noura et al, 2017)**

GDM in turns increases the risk of women to develop T2DM by 50 % later in their life. According to IDF; there will be anticipated increase of T2DM consequent from GDM 55% by 2035 ***(IDF, 2017).*** Furthermore, Women whose pregnancy was complicated by gestational diabetes have a 7-foldhig her risk of developing diabetes, primarily type2. Early detection can prevent or delay the onset of late complications, for which follow-up screening is important ***(Olesen et al, 2014).***

According to World Health Organization (WHO), the burden of any disease can be controlled and reduced through implementation of evidence based strategies for prevention, early detection and management. So, adequate health education and timely postpartum screening interventions may prevent or postpone the development of type 2 DM. In addition, early diagnosis and treatment of type 2 DM may contribute to the prevention of long-term DM complications, including cardiovascular- and renal diseases; which in terns affects their quality of life later on. Based on this, there is a growing body of research regarding the importance of postpartum glucose screening but most of them ignore to investigate factors affecting women's compliance to

postpartum glucose screening. As a result, the burden of diabetes increases worldwide, therefore preventive actions are urgently needed (WHO, 2016).

Aim of the Study:

This study aimed to assess barriers affecting compliance of women with history of gestational diabetes to post- partum glucose screening through:

1. Assessment of women's knowledge concerning post-partum glucose screening.
2. Assessment of barriers affecting women's compliance with post-partum glucose screening.

Research Questions:

1. Are the women has correct knowledge regarding post -partum glucose screening?
2. What are the barriers affecting women's compliance with history of gestational diabetes to post-partum glucose screening?
3. What are women' reasons for compliance and non-compliance with post-partum glucose screening?

Subjects and Methods:

1-Technical Design:

Research design: descriptive study design

Setting: postnatal unit at Maternity hospital at Ain Sham University.

Subjects:

Sample size 360 women

Sample type purposive

Sample criteria

Had history of GDM

Medically and gynecological free

Study tools:

Tool: Structured interviewing questionnaire named "mother's knowledge regarding post-partum glucose screening and factors affecting their compliance with post-partum glucose screening". Developed by the researcher.

It included 4 parts as follows:

Part (1): assessment of general characteristic of subjects under study which included 6 questions assessed these items: (age, marital status, place of residence, academic educational level, occupational status of mother, medical insurance.

Part (2): assessment of obstetric and gynecological history of the mother, which included 17 open and closed ended questions such as (Parity, Gravidity, number of living birth, abortion, history of follow up during pregnancy, mode and place of delivery and newborn feeding method).

Part (3) assessment of women's knowledge regarding gestational diabetes Mellitus (GDM) and postpartum screening for diabetes. Which included 15 open and closed ended, multiple choice questions and related to their knowledge about GDM, risk factors for acquiring GDM during pregnancy, signs of elevated blood glucose level, signs of decreased blood glucose level, effects of GDM on mothers, effects of GDM on fetus, glucose level screening during pregnancy, complications of GDM on mothers and fetus during pregnancy, delivery and postpartum, women's knowledge regarding post-partum glucose screening, timing of the screening after delivery, importance of the test and it's types.

Scoring System:

. **Scoring system for women's knowledge regarding GDM and post-partum glucose screening:**

Correct answer had score (2), while incorrect had score (1). Subsequently, total knowledge score was calculated then, total knowledge was converted into correct knowledge equal 60 % or more, while incorrect knowledge if less than 60%.

Tool 2: Assessment of "Factors that affecting mothers' compliance with postpartum glucose screening". Which included four main factors: such as women factors, health care system factors, test factors and social factors. All questions were an open and closed ended questions that could be a reason hinder their compliance with post-partum glucose screening.

❖ **Scoring system:**

Scoring system for women's compliance and non –compliance to post - partum glucose screening.

Comply was given (2) score. While, not comply was given (1) score

Total scores was calculated then converted into two category; compliance if equal 60 % or more, while non-compliance if less than 60%.

Content validity of the tool:

All Tool of data collection were reviewed by a panel of 3 experts in maternity health nursing at faculty of nursing Ain Shams University to test the comprehensiveness, accuracy and clarity in language. According to their comments, modifications in phrasing and sequencing of statements were considered.

Ethical considerations:

- An Official permission was obtained to the director of the Ain Shams University Maternity Hospitals where the study was conducted.
- The researcher was clarified the objective, aim and sitting of the study to the all mothers included in the study.
- The researcher was maintained anonymity and confidentiality of the subject data.

Administrative design:

An official permission letter containing the title and purpose of the study was sent to the director of the Ain Shams University Maternity Hospitals.

Operational design:

The study was conducted through two phases:

I. Preparatory phase.
II. Implementation and evaluation phase.

I. Preparatory phase:

The researcher had reviewed advanced national and international to prepare and develop the study tools and to get acquainted with the various aspects of the research questions, afterwards, a pilot study done.

Pilot Study:

A pilot study was carried out on the wom whom were admit to previous mentioned stu setting for one month (38 women that represent 10% of total study sample). The entire samples involved in the pilot study were included in the study sample as no modification done in the tools of data collection.

A. Implementation phase (field work):

- Through this phase, the researcher visited the previous mentioned study setting three days per week from 09:00 am to 02:00 pm to collect data for twelve month started from 1st January, 2020 to the end of December, 2020.
- At beginning of the interview the researcher start to introduce her self and explained berifely the aim of the study to the studied women to gain confidence and trust then obtain oral consent from them.
- The researcher interviewed post-delivery women who fulfilled the sample criteria individually in postnatal unit at Ain Shams maternity hospital.
- The average number of women interviewed per day were (6) women filling of the structured interview questionnaire which were used to assess women's general characteristics, obstetric history, present delivery and knowledge about GDM after finishing of interview the researcher asked each mother to provide phone number to follow them after discharge and complete fourth and fifth part of data collection.
- The total duration of each interview was (25) minutes.
- The researcher made phone contact with each mother to follow their performance of postpartum glucose screening in addition to assessment of factors which may hinder their compliance to post-partum glucose.
- The researcher repeated the previous steps until finished the previous mentioned sample size.

Statistical design:

Data entry in the study was be done by using quality control through two stages which were coding and data entry. Obtained data was be statistically analyzed, organized & presented in numbers, percentage, tables, and figures, & as required. Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois,

USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

The following tests were done:

- Chi-square (x^2) test of significance was used in order to compare proportions between qualitative parameters.
- Pearson's correlation coefficient (r) test was used to assess the degree of association between two sets of variables
- The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:
- Probability (P-value)

– P-value <0.05 was considered significant.
– P-value <0.001 was considered as highly significant.
– P-value >0.05 was considered insignificant.

Results:

Figure (1): Indicated that (59.2%) of the studied women had incorrect total knowledge while, (40.8%) of studied sample had total correct knowledge.

Figure (2): represented that (75%) of the studied women had non- Compliance with postpartum glucose screening; while, (25%) of them had compliance with postpartum glucose screening.

Figure (3): This figure showed that total factors that affect studied sample compliance and non-compliance with post-partum glucose screening. The most prominent factor was (78.6%) of health team as a barrier prevent women's compliance to PPGS.

Table (2): indicated that, there were highly statistically significant relation between women's compliance with post-partum glucose screening and total factors as barriers to adhere with post-partum glucose screening which prevent their compliance to post-partum glucose screening. (p-value <0.001).

Table (3): showed that, there were highly statistically significant moderate positive correlation between total studied sample knowledge regarding gestational diabetes during pregnancy, postpartum glucose screening of the studied women's and their total score of factors affecting their compliance with post-partum glucose screening (p -value<0.001).

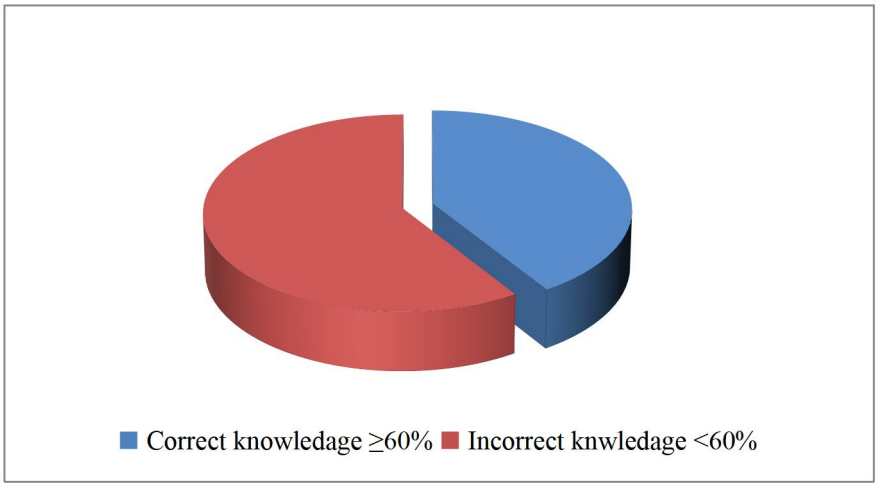

Figure (1): Percentage distribution according to studied sample correct and incorrect knowledge regarding post-partum glucose screening. (N = 360).

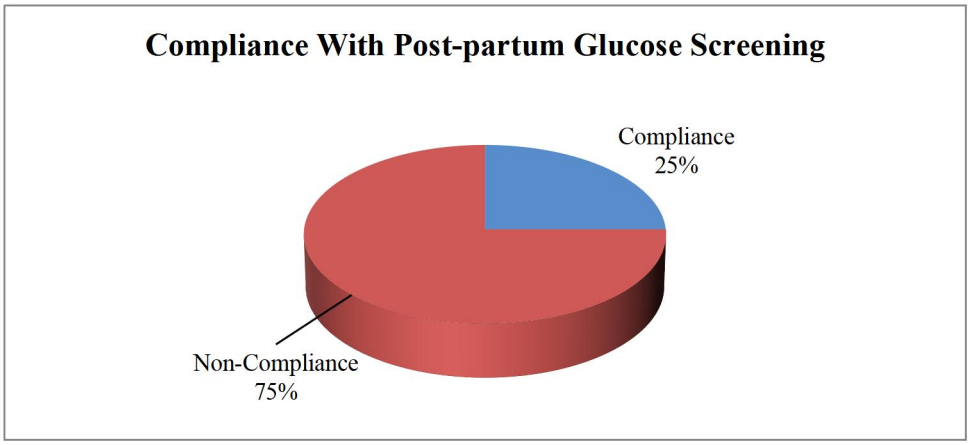

Figure (2): Percentage distribution of studied women according to their compliance with post-partum glucose screening.

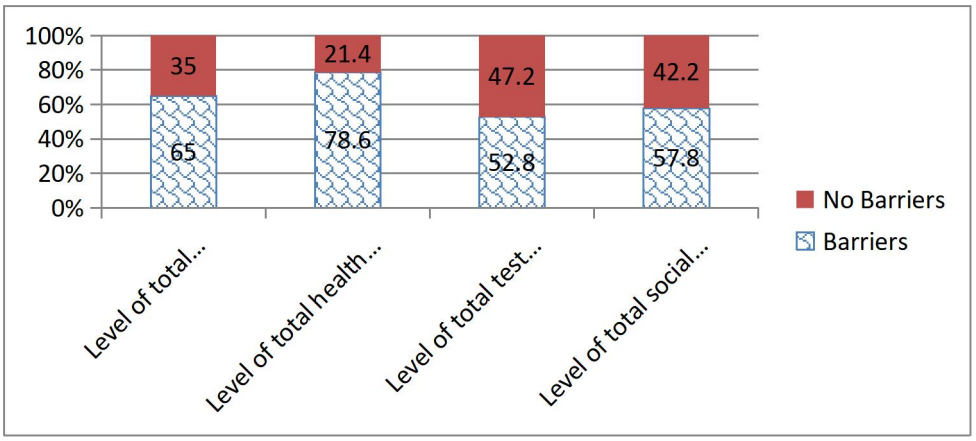

Figure (3): percentage distribution according to total factors that affect studied sample compliance with post-partum glucose screening. (N=360).

Table (2): relation between studied sample compliance total factors that prevent their compliance with post-partum glucose screening. (N=360).

Total domain of factors		Compliance with post-partum glucose screening				Chi-square test	
		Compliance (n=90)		Non-Compliance (n=270)			
		No.	%	No.	%	x2	p-value
Total women's factors	Barriers	29	32.2	205	75.9	54.766	<0.001**
	No Barriers	61	67.8	65	24.1		
Total health team's factors	Barriers	46	51.1	237	87.8	51.814	<0.001**
	No Barriers	44	48.9	33	12.2		
Total test factors	Barriers	36	40.0	154	57.0	7.193	0.007*
	No Barriers	54	60.0	116	43.0		
Total social factors	Barriers	74	82.2	134	49.6	28.072	<0.001**

No Barriers	16	17.8	136	50.4

P-value >0.05 NS; *p-value <0.05 S; **p-value <0.001 HS

Table (3): Correlation between studied sample total knowledge and total score of factors affecting their compliance to post-partum glucose screening.

Total score of knowledge		**Total score of factors**
Total score of knowledge about gestational diabetes during pregnancy	*r-value*	0.753
	p-value	<0.001**
Total score of knowledge about postpartum glucose screening	*r-value*	0.614
	p-value	<0.001**
Total score of knowledge regarding gestational diabetes during pregnancy and postpartum glucose screening	*r-value*	0.684
	p-value	<0.001**

Using: Pearson's correlation coefficient (r); **p-value <0.001 HS

Discussion:

Although postpartum screening is highly important and there is a universal call to increase women with prior gestational diabetes awareness to comply with it, there are so many factors hindering their compliance to it. For instance, there are factors related to patient such as tiredness, maternal attachment and childcare demands are prominent barriers in the early postnatal months. Later, work, family and child development became more significant barriers (Cho et al, 2015).

The present study aimed to assess barriers affecting compliance of women with history of gestational diabetes to post- partum glucose screening.

Regarding the compliance with PPGS the present study demonstrated that, three quarter of the studied sample had non-Compliance with postpartum glucose screening. This result matched **Saleha et al., 2017** who studied" Post-partum follow-up of women with Gestational Diabetes Mellitus: Effectiveness, Determinants and Barriers", revealed that, many women do not follow the instructions geven by health care providers regarding glucose follow up after delivery and only limited number of participants (n=27) opted for the screening either by 75-g- OGTT or by HbA1c level.

Moreover, the study results came in same line with, **Krishnaveni et al. 2007** in a 5-year follow-up study from India reported low rates of attendance at the 6-week follow-up.

On the other hand, this result was in contrast with, two studies reported half of the sample demonstrated the highest prevalence of postpartum glucose screening were the Kaiser Permanente Medical Care Program in Northern California and the Kaiser Permanente Northwest Health Maintenance Organization in Oregon and Washington State.

Concerning to the relation between studied sample total factors and their compliance with PPGS, The preset study illustrated that, there was highly statistically significant relation between women's compliance with post-partum glucose screening and total factors as barriers to adhere with post-partum glucose screening which hinder their compliance to post-partum glucose screening (p-value <0.001).

The present study matched with a systemic review by **Nielsen et al. 2014** who investigated "From screening to postpartum follow-up–the determinants and barriers for gestational diabetes mellitus" he concluded that there was highly statistically significant relation between women's compliance with post-partum glucose screening and health care provider not seeing the patient, the patient being lost to follow-up, lack of communication/collaboration between health care providers, inconsistent guidelines or lack of familiarity to guidelines, not aware about history of GDM, patients not

considering the test necessary, or declining testing, or unable to complete test, testing not affordable, patient uninformed or lack understanding of need for test, practice being too busy, time pressure (women), lost requisition, recent delivery experience, baby's health issues, adjustment to the new baby (emotional stress, feeling over-whelmed and lack of time and burden of child care), concerns about postpartum and future health (feeling healthy and not in need for care, and fear of receiving bad news), and experiences with medical care and services (dissatisfaction with care and logistics of accessing care) which consider as Barriers to postpartum screening.

Moreover, the present study in the same line with **Ruggiero et al. 1990** who studied "Impact of social support and stress on compliance in women with gestational diabetes" found that there was highly significant association between women's compliance with post-partum glucose screening and social support (p-value <0.001).

Concerning to the relation between studied sample total knowledge and their compliance to PPGS, the present study illustrated that there was highly statistically significant relation between total level of knowledge of the studied women's and their compliance with post-partum glucose screening (p-value <0.001).

The result agreed with **Hoedjes et al. 2012** who studied "Motivators and barriers to a healthy postpartum lifestyle in women at increased cardiovascular and metabolic risk" found that there was highly association between mother knowledge and their compliance with post-partum glucose screening.

Moreover, the result agreed with, **Kaptein et al. 2015** who studied "The subjective impact of a diagnosis of gestational diabetes among ethnically diverse pregnant women" showed statistically significant relation between total level of knowledge of the studied women's and their compliance with PPGS. As many of the women considered diagnosis of GDM as a signal to adapt to a healthy lifestyle, and a majority of them also reported a high perception of diabetes risk in future.

Conclusion

The present study concluded that, more than half of studied sample had incorrect total knowledge regarding PPGS. The majority of studied sample did not comply with PPGS. Finally, the reasons for non-compliance with postpartum glucose screening were level of the studied women's knowledge in addition to health team, women, and social factors as barriers to adhere with post-partum glucose screening.

Recommendations:

1. Design and implement counseling sessions at postnatal units to enhance gestational diabetic women's knowledge and compliance with post-partum glucose screening.

2. Awareness raising campaigns must be designed and implemented by the faculty of nursing at Ain Sham University to enhance family members' knowledge and attitudes towards pregnant women.

Limitations of the study:

20 mothers were dropped out as researcher can't contact them after hospital discharge to follow their compliance with postpartum glucose screening test.

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