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Knowledge of Gestational Diabetes Mellitus among antenatal women in Obstetrics and Gynaecology Clinic, Public Hospital Malaysia.

Zarina Binti Haron[1]*, Norhazirah Md Jani[1], Salimah Japar[1], Santhi Yew Roan Nee[1], Azura Abdul Halain[1] Kim Geok Soh[2,3], [1]Kim Lam Soh[1]*

[1]Department of Nursing, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia
[2]Department of Sport Studies, Faculty of Educational Studies, Universiti Putra Malaysia, Selangor, Malaysia.
[3]Sports Academy, Universiti Putra Malaysia, Selangor, Malaysia.

***Corresponding Author:** Zarina Binti Haron & Kim Lam Soh Department of Nursing, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia

Abstract: Gestational diabetes mellitus (GDM) is one of the most common medical complications of pregnancy. GDM increases maternal and foetal morbidity and increase the risk of future type 2 diabetes for the maternal. This study aims to determine the knowledge of GDM among antenatal women in Obstetrics and Gynaecology Clinic, in a Malaysia government hospital. A cross-sectional study design with systematic random sampling method was used to select antenatal women in the Obstetrics and Gynaecology Clinic. A self-administered questionnaire was used. All the data obtained were analysed using the Statistical Analysis Package for Social Sciences (SPSS), Version 20.0. The total mean knowledge score of 140 respondents was 3.09±SD0.47. There is knowledge deficit found among the antenatal mothers related to basic knowledge of GDM: Definition of GDM (91.4%), Knowledge about treatment of GDM: The important of exercise to help women with GDM (80.7%) and Knowledge about complication of GDM: Women with GDM have risk getting larger baby (81.4%). This study will provide information for health care providers to develop effective health education for preventive approaches in order to prevent the complication of GDM to women and foetus.
Keyword: Gestational Diabetes Mellitus (GDM), antenatal women, knowledge

Introduction

Gestational diabetes mellitus (GDM) is defined as glucose intolerance of varying degree with onset or first recognition during pregnancy. (American College of Obstetricians and Gynecologists, 2013; Rajput, Rajesh; Yadav, Yogesh; Smiti, Nanda, Yogesh, & Rajput, 2013). GDM constitutes 90% of diabetes in pregnancy (Arulkumaran, Sivanesatnam, Chatterjee, 2017). GDM normally develops later in pregnancy and maybe after pregnancy if antenatal women do not follow the balanced diet and healthy lifestyle (Arulkumaran, Sivanesatnam, Chatterjee, 2017).

Gestational diabetes mellitus is the most common complications of pregnancy (American College of Obstetricians and Gynecologists, 2013). Globally, the prevalence of diabetes, including GDM, is predicted to rise from 2.8% in 2000 to 4.4% in 2030, health complications associated with exposure to GDM will also increase (Bouthoorn et al., 2014). Prevalence of GDM is known and a wide difference depending on the area or country, population dietary habits and socioeconomic status (Rajpur et al., 2013). The increasing prevalence of GDM is associated with higher obesity rate and diabetes mellitus (Hussain, Yusoff, & Sulaiman, 2015).

Rajput et al., (2013), stated that the increasing in prevalence of GDM was associated with increasing age. Those women within the range of age 25 to 30 years had four times higher risk to get GDM as compared with the women who age group 20-24 years (Carolan, Davey, Biro, & Kealy, 2011). Meanwhile, those women who aged more than 40 years, their risk of having of GDM was more six times higher as compared to women aged group between 20 and 24 years (Carolan et al., 2011). Other risk factors of development of GDM are; family history of diabetes, and Asian ethnicity (Hussain et al., 2015). GDM complicate the pregnancy and increase morbidity and mortality rate for women and infants (Carolan-Olah, Duarte-Gardea, Lechuga, & Salinas-Lopez, 2017). The common complication to the infant of GDM women is stillbirth and macrosomia that caused sustain birth injuries such as fractures and nerve damage (Carolan, 2013). Infants of GDM women needs to be admitted to special care nursery to observe for hypoglycaemia and respiratory problems (Carolan, 2013). Women with GDM have a high risk of abortions, stillbirths, obstructed labour, shoulder dystocia and pregnancy-induced hypertensive disorders, pre-eclampsia, and postpartum haemorrhage (Carolan, 2013; Khan, Ali, & Khan, 2013).

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Rajput et al. (2013) found that GDM rate increased with increasing educational qualification of the participants who were graduated or above. Contrary to the study done by Bouthoorn et al. (2014), women with low education qualification had a significantly increased risk of GDM as compared with the women with the high education level. On the other hands, those women who diagnosed GDM are from upper and middle class of socioeconomic status are being found to be increasing in the prevalence of GDM compared to women who from lower-middle-class economic status as mentioned by Rajput et al., (2013). Based on the study done by Rajput et al., (2013), the multiple factors such as increases age of antenatal women, higher pre-pregnancy weight and body mass index and sedentary lifestyle in women of higher economic status could become associated with having GDM

Knowledge is considered as one of the important components of health literacy (Sayakhot, Carolan-Olah, & Steele, 2016). Inadequate health literacy is associated with limited knowledge about the disease. It results in limited adherence to disease management strategies which in turn leads to unfavourable maternal and foetal outcomes (Hussain, Yusoff, & Sulaiman, 2015). This study revealed that knowledge is among the modifiable factor that is associated with better glycaemic control (Hussain et al., 2015). Knowledge about GDM is important and needs concerns of women with GDM that can be prevented the complication and enable to manage their condition effectively (Utz et al., 2017). It's also long term beneficially of knowledge also can be used to improve outcome of pregnancy and that also could help to decrease the future of diabetes type 2. Therefore, this study aims to determine the knowledge of GDM among antenatal women in Obstetrics and Gynaecology Clinic, in a Malaysia government hospital.

MATERIALS AND METHODS

This is a cross-sectional study using a face to face interview. The study was conducted in Obstetrics and Gynaecology Clinic, in a Malaysia government hospital. Data were collected from September 2015 to June 2016. The questionnaire was adopted from Carolan, Steel, and Margetts (2010). The questionnaire was taken from Diabetes Knowledge Questionnaire (DKN), a validated tool for knowledge assessment of type 1 and type 2 diabetes mellitus patients (Dunn et al. 1984). The questionnaire was reviewed and examined by an expert in the field. A questionnaire was piloted on 17 antenatal women. Reliability analysis conducted showed the Cronbach's alpha was 0.7.

The questionnaire was divided into sociodemographic and knowledge. The knowledge was consisting of basic knowledge on the definition of GDM (one questions), the risk factor of GDM (two questions), treatment of GDM (4 questions) and complication of GDM (3 questions). The format of the questionnaire was in multiple choice with one option was "I don't know" to avoid the unnecessary answer by the respondents. Score 1 was given for every right answer and 0 to every wrong answer. A higher score indicated for better knowledge of GDM and the maximum score is 10 and minimum is 0. The questionnaire was distributed to the respondents by the researcher. All respondents were notified regarding the study and written consent was taken. All respondents were given a set of questionnaire, participant information sheet and informed consent. The data were obtained during face to face interviewed. Approximately 10 to15 minutes were required to complete all questions.

All data acquired in this study were analysed using the Statistically Package for Social Sciences (SPSS) version 20.0 for Windows. Descriptive analysis such as frequency and percentage was used to describe the socio-demographic characteristic and knowledge of gestational diabetes mellitus including risk factor, treatment and complication of gestational diabetes mellitus that contribute to gestational diabetes mellitus among antenatal women.

Ethical approval was obtained from University Ethics Committee for Research involving Human Subjects, Medical Research and Ethics Committee, Malaysia. Permission from Director of the hospital, Head of Department Obstetrics and Gynaecology clinic was also obtained to conduct this research.

RESULTS

Demographic characteristics

A total of 140 antenatal women participated in this study. Participant characteristics are presented in Table 1. The majority of antenatal mothers were age between 30 and 34 years, with a mean age of 30.66±SD 6.0. Majority of the respondents are Malay (58.6%) and 52.9% of the respondents were graduated from college or university. Majority of the respondents have moderate monthly income (77.9%). Approximately 38.6% of the respondents were overweight.

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Knowledge about GDM

The response of respondents to all GDM knowledge as represented in Table 2. Knowledge was recorded in terms of right or wrong answers and is represented in numbers and percentage. Only 8.6% of the respondents have a basic knowledge on GDM. However, majority of the respondents know about risk factors of GDM 89.3 and 100%, respectively. Only 19.3% have knowledge about treatment of GDM which exercise can help women with GDM in lowering blood sugar. The majority of respondents (91.4%) have a good knowledge regarding the need to consult with a doctor if uncontrolled blood sugar level. More than half of the respondents 61.4% do not know the normal range of fasting blood glucose level for pregnant women.

Majority of the respondent's lack of knowledge on the complication of GDM whereby only 81.4% have knowledge about women with GDM have a risk getting a larger baby than usual. Approximately, 67.1% of the respondents have good knowledge increases the risk baby getting shoulder dystocia if the size of the baby larger than usual. The majority of the respondent 81.4% have a good knowledge of women with GDM will have delivery through caesarean section. Table 3 shows mean knowledge score for different knowledge categories. The total mean score was 3.09 ±SD 0.47.

DISCUSSION

Focusing on each category of GDM knowledge, only 12(8.6%) of respondents could correctly understand the meaning of GDM and 81.4% antenatal women lack knowledge about the complication of GDM which is important to understand the disease process. Although the majority of the respondents were graduated from college or university their basic knowledge on GDM as well as its complications is still lacking. Although they are among the group who will have more knowledge and easy access to information technology compare to respondents who have low education level. Contrary to a study done by Hussain et al., (2015) found that educational level was considered as a strongest influencing factor for the level of knowledge across all knowledge domains. Patients with primary education had least knowledge score whereas patients who had degree level education showed maximum knowledge score. Patients with higher educational level might have greater opportunity to get knowledge from health-related literature, internet sources and books.

The complication may increase maternal and foetal morbidity and all women diagnosed with GDM need high-quality multidisciplinary (combine care) education in order to apply necessary changes to their diet and lifestyle (Alayoub, Curran, Coffey, Hatunic, & Higgins, 2017).

Among all the knowledge questionnaires, the findings of this study showed poor knowledge (80.7%) about the treatment of GDM which the question was "exercise can help women with gestational diabetes mellitus in lowering blood sugar". This finding shows that most of the respondents do not know that exercise enable in lowering blood sugar level. Although not many studies on exercise for women in GDM, there a few published study on exercise trials in women with GDM showed improvement in glucose levels (American College of Obstetricians and Gynecologists, 2013; Sayakhot et al., 2016). Knowledge about the exercise as one of the non-pharmacologic treatments that are effective in managing GDM to reduce blood sugar level (American College of Obstetricians and Gynecologists, 2013; Carolan-Olah et al., 2017). Furthermore, regular exercise is important even after delivery to prevent type 2 diabetes.

In addition, more than half of the respondents (61.4%) don't have knowledge about 'The normal range of fasting blood glucose level for pregnant women'. Those women with GDM should know about the normal blood sugar level because they have to self-manage the disease at home. Knowing the level of blood sugar level will enable the antenatal women to seek medical treatment when needed. An intervention study in Australia found that GDM women had difficulties to follow a self-management plan even after they had attended the class, which will lead to complication (Sayakhot et al., 2016). This also similar concerns study in Malaysia where GDM respondents demonstrated poor knowledge on the management of GDM (Hussain et al., 2015).

Conclusion

This study highlights the lack of knowledge regarding GDM among antenatal women in Malaysia. Although this study was conducted in the single setting in the government hospital, however, the population that participated in this study represent the main Malaysia ethnicities with the similar social-economic background. The finding of this study will provide a snapshot regarding of current knowledge regarding GDM among antenatal women that need to be emphasised by the health care providers in this hospital setting as well as other government hospitals in Malaysia. There is need to develop health education tools for prevention of GDM to mothers and foetus. In order to improve knowledge of GDM to the antenatal women, updating knowledge and skills of health care providers is important. Utz et al. (2017), suggests that providers need to update knowledge

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and skills through both pre and in-service training in order to improve the management of antenatal women with GDM (Utz et al., 2017).

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Table 1: Demographic characteristics

Variable	Mean±SD	n (%)
Age:	**30.66 ± 6.0**	
<25 years		16 (11.4)
25-29 years		42 (30.0)
30-34 years		48 (34.3)
≥35 years		34 (24.3)
Ethnic		
Malay		82 (58.6)
Chinese		36 (25.7)
Indian		21 (15.0)
Others		1 (0.7)
Educational level		
Primary school		3 (2.1)
Secondary school		63 (45.0)
College / University		74 (52.9)
Monthly income		
<RM1000		12 (8.6)
RM1001-RM3000		109 (77.9)
>RM3000		19 (13.6)
Body mass index (BMI)		
<18.5		1 (0.7)
18.5-24.9		76 (54.3)
25-29.9		54 (38.6)
>30		9 (6.4)

Table 2: Response of participants to all GDM knowledge questionnaires

Questions	Right no. (%)	Wrong no. (%)
Basic Knowledge on GDM		
Q1 Gestational diabetes is	12 (8.6)	12**8 (91.4)**
A1 High blood sugar due to defect in insulin		
Knowledge about risk factor		
Q1 You are at risk of developing gestational diabetes mellitus if you are:	125 (89.3)	15 (10.7)
A1 Overweight		
Q2 You have chances to develop gestational diabetes mellitus if you have:	140 (100)	0 (0.0)
A2 Family history of diabetes mellitus		
Knowledge about treatment of GDM		
Q1 Exercise can help women with gestational diabetes mellitus in:	27 (19.3)	**113 (80.7)**
A1 Lowering blood sugar		
Q2 Women with gestational diabetes mellitus on insulin who find have constantly increasing blood glucose level need to	113 (80.7)	27 (19.3)
A2 Consult with doctor		
Q3 If you have uncontrolled of blood sugar level, you need to:	128 (91.4)	12 (8.6)
A3 Frequent monitoring of blood sugar		
Q4 The normal range of fasting blood glucose level for pregnant women;	54 (38.6)	**86 (61.4)**
A4 Less than 5.3 mmol/L		
Knowledge about complication of GDM		
Q1 Women with gestational diabetes mellitus have risk getting baby with:	26 (18.6)	**114 (81.4)**

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A1	Larger than usual		
Q2	If the size of your baby is larger than usual it can lead to:	94 (67.1)	46 (32.9)
A2	Increase the risk baby getting shoulder dystocia where the anterior Shoulder of the infant cannot pass below during the delivery		
Q3	Women with gestational diabetes mellitus will have delivery through:	114 (81.4)	26 (18.6)
A3	Caesarean section delivery		

Score 1 was given to every right answer and score zero was given to every wrong answer. Maximum score is 10 and minimum is 0. Mean knowledge score of participants was 3.09 (SD = 0.47)

Table 3: Knowledge score for all categories

Knowledge domains	**Maximum possible score**	**Mean ± S.D**
Knowledge on definition of GDM	1	0.08 ± 0.28
Knowledge about risk factors	2	1.94 ± 0.25
Knowledge about treatment	4	1.90 ± 0.30
Knowledge about complication	3	0.08 ± 0.27
Mean total score	10	