Journal of Pharmaceutical Research International

33(47B): 497-505, 2021; Article no.JPRI.75018
ISSN: 2456-9119
(Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759)

A Study on Knowledge, Attitude and Practice Regarding Gestational Diabetes Mellitus (GDM) and Its Control with Medical Nutritional Therapy among Antenatal Patients in a Tertiary Care Hospital in a Semi Urban Area

M. Shafaiyaz[1*] and G. Rohini[2]

[1]Saveetha Medical College, Thandalam, Chennai, India.
[2]Department of Obstetrics and Gynecology, Saveetha Medical College, Thandalam, Chennai, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i47B33149
Editor(s):
(1) Dr. Takashi Ikeno, National Institute of Mental Health, National Center of Neurology and Psychiatry, Japan.
Reviewers:
(1) Jussara Gue Martini, Universidade Federal de Santa Catarina, Brazil.
(2) Vijayata Sangwan, Bhagat Phool Singh Govt Medical College for Women, India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/75018

Original Research Article

Received 10 August 2021
Accepted 20 October 2021
Published 04 November 2021

ABSTRACT

Introduction: Gestational diabetes mellitus is a condition in pregnancy which can cause foetal and maternal complications. After delivery the newborn may have life threatening metabolic complications and later in life may suffer from obesity, glucose intolerance and Diabetes in early adulthood. The mother might also be at the risk of developing type-2 diabetes mellitus. So, the knowledge among the antenatal women will result in disease prevention and early detection.
Aim and Objective: The present study was aimed to assess the knowledge, attitude and practice regarding Gestational Diabetes Mellitus (GDM) and its control with medical nutritional therapy among antenatal patients in a tertiary care hospital in semi urban area.
Materials and methods: A cross-sectional study was conducted in Saveetha Medical College and hospital, Chennai, with a participation of 190antenatal patients attending the hospital for regular antenatal check up and admission for delivery. The study was conducted between the months of January and June of 2021.

Results: In total of 190 study participants, 38(20%) participants acquired the knowledge about Gestational Diabetes Mellitus from family, 73(38.42%) participants acquired from friends, 47(24.73%) participants acquired from medical professionals and 32(16.85%) participants from neighbour.
Conclusion: There was a paucity of knowledge among pregnant women about GDM and its complications. Attitude and practices of antenatal women should be improved through various programs and channels for better antenatal outcomes.

Keywords: Gestational diabetes mellitus; knowledge; antenatal patients; attitude; practice.

1. INTRODUCTION

Pregnancy is a distinctive, thrilling and often cheerful moment in a woman's life as it creates a bond between women and her unborn baby during her transition towards motherhood. At the same time, it is also a critical period in which a proper care and attention is needed for ensuring the health of the mother and the baby which is influenced greatly by that of maternal nutrition. Along with all the worries and obstacle faced during pregnancy, Gestational Diabetes Mellitus (GDM) is one of the most serious complications which are due to some abnormal metabolic activities occurring in pregnant women. Gestational Diabetes Mellitus is defined as "glucose intolerance that is detected during pregnancy" [1] or "carbohydrate intolerance resulting in hyperglycaemia of variable severity with onset or first acknowledgment in the course of pregnancy" [2].

Moreover, the prevalence of GDM has increased among various race and ethnicity in just past 20 years [3]. The prevalence of Gestational Diabetes Mellitus in southern India was 17.8% in urban, 13.8% in semi-urban and 9.9% in rural areas [4]. A good knowledge of GDM will play a major role in preventing the complications. Though the mother's glucose levels return to normal after birth, the mother is at a high risk for development of Type 2 diabetes mellitus, and the child of a woman with GDM is also at risk for manifesting metabolic syndromes [5]. So a well informed patient, by proper management of her diet and by adhering to the medical management as advised by her physician, will have good pregnancy outcome for herself and her baby. As the antenatal period is a perfect opportunity for detecting and preventing complications of GDM, two generations can be protected from adverse effects of diabetes mellitus. Many patients are unaware of the conditions of GDM.

Even after diagnosis, they are unaware of the importance of adhering to strict diet and medication and present late in pregnancy with complications. In the view of the above, this study is aimed to assess the knowledge, attitude and practice regarding Gestational Diabetes Mellitus (GDM) and its control with medical nutritional therapy among antenatal patients in a tertiary care hospital in semi urban area.

2. METHODOLOGY

The present cross-sectional study was conducted in Saveetha Medical College and hospital, Chennai with aim to assess the knowledge, attitude and practice regarding Gestational Diabetes Mellitus and its control among antenatal patients in semi urban area. The required Sample size was calculated using formula, $N=4pq/L2$ where p was 13.8% (based on the study previously done in Chennai by V Seshiah et al. [4] with allowable error of $L = 5\%$ and the total sample size required was rounded off to 190. The antenatal patients attending the hospital for regular antenatal check-up were included in this study. In this study, convenient sampling method was used for selecting the study participants. A pretested semi-structural questionnaire was prepared which included socio-demographic information and specific question with the aim to assess the knowledge, attitude and practice regarding Gestational Diabetes Mellitus and its control among antenatal patients. The questionnaire was validated by esteemed professionals. The purpose of the study was explained to the participants, and they were given the prepared questionnaires to fill out. The questionnaire contained four sections with section-A comprising the information regarding the socio-demographic details, section-B contained the questions regarding knowledge on GDM, section-C comprised of questions regarding attitude towards GDM and section-D the questions regarding the practice to control GDM during pregnancy. After obtaining the data, it was entered in the excel spreadsheet and was analyzed using SPSS software version 16 and

statistical analysis was done using Chi square test and frequencies and percentages were obtained.

3. RESULTS

In total, 190 antenatal patients were studied which comprised of subjects in various reproductive age groups. The socio demographic details of the antenatal patients have been listed below in Table 1.

From the data collected, 57(30%) subjects had heard about Gestational Diabetes Mellitus where as remaining 133(70%) pregnant women said they do not know about the condition. To the question, “From where did you get to know about Gestational Diabetes Mellitus?” the responses are accordingly depicted in Fig. 1.

Various other questions related to the level of knowledge of the participants regarding GDM are discussed in Table 2.

Table 1. Socio-demographic details of the pregnant women

Characteristic	Frequency (n=190)	Percentage (%)
Pregnant women		
Age group		
15-19	15	7.89
20-29	72	37.89
30-39	88	46.33
>40	15	7.89
Gravidity		
Multigravida	136	71.58
Primigravida	54	28.42
Educational status		
Illiterate	69	36.31
Secondary school	18	9.47
Higher secondary school	49	25.78
Graduate	54	28.44
Occupation		
Home maker	103	54.23
Professional	37	19.47
Health care worker	18	9.47
Farmer	14	7.36
Laborer	18	9.47
Socio-economic class (Modified BG Prasad classification)		
Upper	28	14.74
Upper middle	103	54.23
Middle	47	24.74
Lower middle	8	4.21
Lower	4	2.08

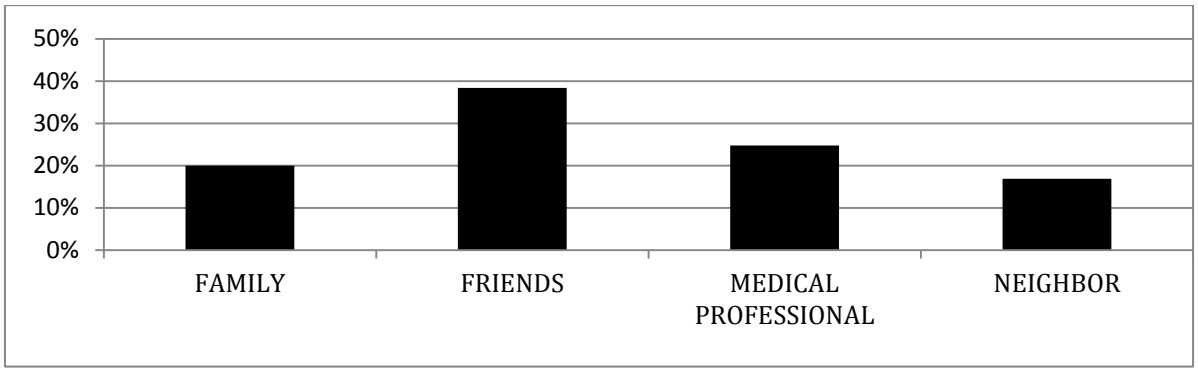

Fig. 1. Source of knowledge about Gestational Diabetes Mellitus

Table 2. Knowledge of the participants regarding GDM

S. no	Variable	Frequency (n=190)	Percentage (%)
1.	**Do you have any familial history of diabetes?**		
	Yes	65	34.21
	No	125	65.79
2.	**Do you have any knowledge about Gestational Diabetes Mellitus?**		
	Yes	57	30
	No	133	70
3.	**Do you have history of Gestational Diabetes Mellitus in previous pregnancies?**		
	Yes	60	31.58
	No	130	68.42
4.	**What are the risk factors of GDM?**		
	Family history of dm	25	13.15
	Obesity	64	33.68
	History of GDM in previous pregnancy	38	20
	Don't know	63	33.17
5.	**Do you think that proper nutrition is important throughout pregnancy?**		
	Yes	101	53.16
	No	89	46.84
6.	**What are the common problems of newborn of a GDM mother?**		
	Big baby	9	4.73
	Preterm labour	16	8.42
	Birth trauma	11	5.79
	Congenital anomalies	24	12.63
	Respiratory distress syndrome	40	3.69
	Don't know	123	64.74
7.	**How is GDM diagnosed?**		
	Urine test	62	32.63
	Blood test after glucose ingestion	69	36.31
	USG	59	31.06
8.	**Do you know insulin controls blood sugar?**		
	Yes	79	41.58
	No	111	58.42
9.	**Do you know how many hours of fasting are recommended before testing fasting blood sugar?**		
	6 hours before test	11	5.79
	8 hours before test	51	26.84
	12 hours before test	22	11.58
	16 hours before test	65	34.21
	Don't know	41	21.58
10.	**Who is responsible for your diabetic care?**		
	Yourself	59	31.05
	Doctor	25	13.16
	Family	27	14.21
	All of the above	79	41.58

Out of the 190 participants, 60(31.58%) antenatal patients had a history of previous Gestational Diabetes Mellitus whereas the other 130(68.42%) subjects did not. When asked about the risk factors about the GDM, 25(13.15%) subjects stated family history of diabetes mellitus, 64(33.68%) subjects mentioned obesity, and 38 (20%) subjects choose history of GDM in previous pregnancy as a risk whereas 63 (33.17%) subjects had no knowledge. When asked about the common problems of the new born of a GDM mother, the responses are accordingly depicted in Fig. 2.

Out of 190 subjects, 99(52.11%) antenatal patients answered affirmatively that complications of GDM can be prevented whereas 91(47.89%) did not agree the

statement. Responses pertaining to the attitude of the participants to the questions which was put forth to them regarding the GDM are discussed below in Table 3.

Similarly, 103(54.21%) subjects agreed that physical exercise during pregnancies is healthy whereas 87(45.79) subjects did not. 84(44.21%) participants among the total 190 of the study population said that they follow a specific dietary regimen during pregnancy whereas 106(55.79%) participants did not. When asked “how do you take your meals?” the responses are accordingly depicted in Fig. 3.

Questions asked to the participants in relation to the practices regarding GDM and its control during pregnancy are discussed below in Table 4.

Three association tables were constructed by ascertain the significance of certain factors associated with knowledge about Gestational Diabetes Mellitus, screening for GDM, following specific dietary regimens during pregnancy using Chi-square test, P-values less than 0.05 were taken as significant and values less than that of 0.0001 were taken as highly significant, these factors have been listed below in Table 5, Table 6 and Table 7.

When asked on how often they would visit hospital for fasting and post-prandial blood sugar testing, 43(22.63%) antenatal patients answered that they would visit once every week, 41(23.69%) antenatal patients would visit once every 2 weeks, and 51 (26.84%) antenatal patients would visit once a month and the remaining told they did not know.

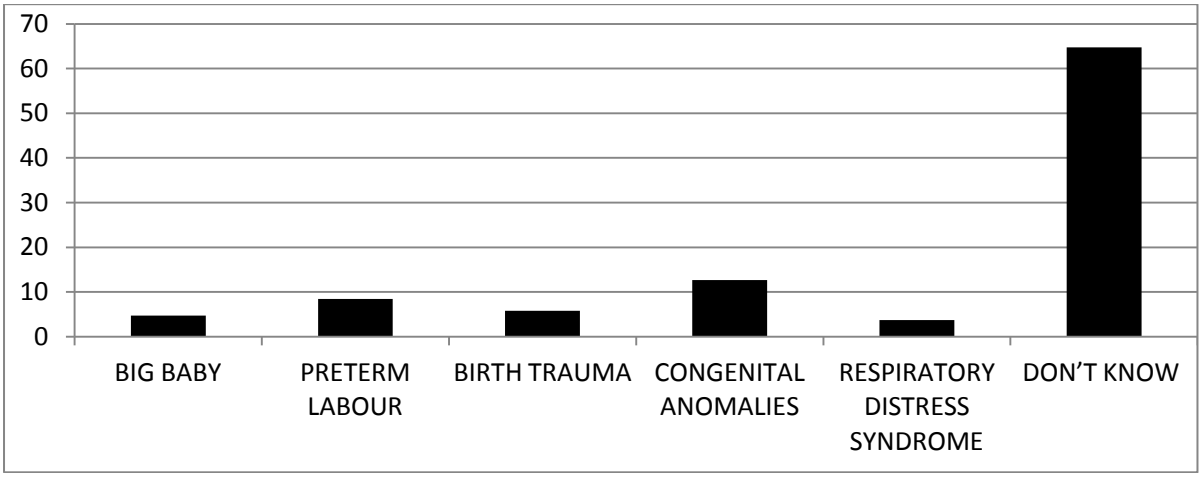

Fig. 2. Common problems of newborn seen in Gestational Diabetes Mellitus

Table 3. Awareness of GDM among participants

S. No	Variable	Frequency (n=190)	Percentage (%)
1.	**Gestational diabetes causes complications in pregnancy**		
	Agree	93	48.95
	Disagree	97	51.05
2.	**Early diagnosis is crucial for preventing complication**		
	Agree	117	61.58
	Disagree	73	38.42
3.	**All pregnancies should be screened routinely for GDM**		
	Agree	103	54.21
	Disagree	87	45.79
4.	**Should one eat more fresh fruits and vegetables during pregnancy**		
	Agree	107	56.32
	Disagree	83	43.68
5.	**Is concept of eating for two (more food for the bay's growth) always correct**		
	Agree	109	57.37
	Disagree	81	42.63

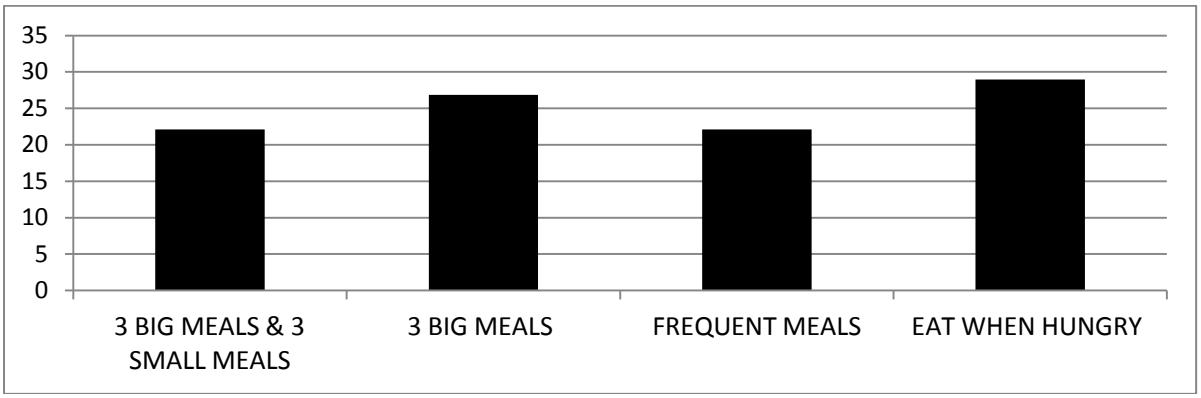

Fig. 3. How do you take your meals?

Table 4. Various practices of participants regarding GDM

S. No	Variable	Frequency (n=190)	Percentage (%)
1.	**Do you eat three or more meals every day**		
	Yes	89	46.84
	No	101	53.16
2.	**Do you have a control from eating junk foods**		
	Yes	114	60
	No	76	40
3.	**Do you follow up weight during pregnancy?**		
	Yes	112	58.95
	No	78	41.05
4.	**Do you visit the doctor regularly during pregnancy?**		
	Yes	111	58.42
	No	79	41.05
5.	**Do you check your blood sugar during pregnancy?**		
	Yes	91	47.89
	No	99	52.11
6.	**What practice will you follow to control if you are diagnosed with gestational diabetes mellitus?**		
	Balanced diet	33	17.37
	Regular antenatal check-up	23	12.11
	Moderate exercise	84	44.21
	Medications	34	17.89
	All of the above	16	12.42
7.	**Do you eat more vegetables than meat in order to control blood glucose?**		
	Yes	102	53.68
	No	88	46.32
8.	**How often do you visit hospital for fasting and post meal blood sugar testing?**		
	Once every week	43	22.63
	Once every 2 weeks	41	23.69
	Once a month	51	26.84
	Don’t know	55	28.94

Table 5. Pregnant women and their knowledge on GDM with various associated factors

Associated factors	Knowledge about gestational diabetes mellitus				p-value
	Yes (n=57)		No (n=133)		
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
Gravidity					
Multigravida	48	84.21	88	66.16	0.011499
Primigravida	9	15.79	45	33.84	
Educational status					
Illiterate	13	22.8	56	42.11	0.002305
Secondary	2	3.52	16	12.03	
Higher secondary	17	29.82	32	24.06	
Graduate	25	43.86	29	21.80	
Occupation					
Homemaker	22	38.6	81	60.91	0.00001
Professional	21	36.85	16	12.03	
Healthcare worker	12	21.05	6	4.51	
Farmer	1	1.75	13	9.77	
Labourer	1	1.75	17	12.78	

Table 6. Attitude of pregnant women towards importance of screening for GDM

Associated factors	Response to screening for GDM				p-value
	Important (n=103)		Not important (n=87)		
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
Age group					
15-19	10	8.13	5	6.87	0.026962
20-29	47	39.03	25	32.97	
30-39	41	47.71	47	40.29	
>40	5	8.13	10	6.87	

Table 7. Practice of following specific dietary regimen during pregnancy

Associated factors	Specific dietary regimen during pregnancy				p-value
	Followed (n=84)		Not followed (n=106)		
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
Gravidity					
Multigravida	68	60.13	68	75.87	0.017
Primigravida	16	23.87	38	30.13	
Occupation					
Homemaker	43	45.54	60	57.46	0.018
Professional	12	16.36	25	20.64	
Healthcare worker	14	7.96	4	10.04	
Farmer	5	6.19	9	7.81	
Labourer	10	7.96	8	10.04	

4. DISCUSSION

In the current study which was performed among 190 antenatal mothers, it was found that only 30% of the subjects had good knowledge about GDM. 54.21% of the subjects had positive attitude towards screening for GDM and 44.21% of the subjects practice a specific dietary regimen during pregnancy. A similar study done in Iran, found a significantly higher knowledge and attitude towards Gestational Diabetes Mellitus [6], whereas the study done in Egypt found that only 18.9% have a practice of following a specific dietary regimen [7].

Our study was found to have a significant correlation (p=0.0114) between pregnant women and their lack of knowledge regarding GDM. Main source of knowledge for the antenatal mothers were from friends (38.42%), from the medical professionals (24.73%), family (20%) and from the neighbours (16.85%). Similar study was conducted in among antenatal mothers attending the primary health center (PHC) in the southern part of India where it was found that major sources of knowledge on GDM were from television/radio (40%), neighbours/friends (34.2%), and family members (29.2%) while doctors (13.3%), health-care workers (20.8%), or hospital charts/boards (18.3%) were less common sources [8].

Many antenatal mothers (54.21%) in our study accepted that all pregnancies should be screened on routine basis for GDM. A similar study in Vietnam also reveals that majority of the women went to hospital regularly to screen for GDM [9]. This regular screening for GDM by monitoring the fasting and post-prandial blood glucose levels has been associated with a reduction in rates of neonatal macrosomia [10].

Majority of the participants (55.79%) in this study did not follow a specific dietary regimen during their antenatal period and few among the antenatal mothers (28.94%) take their nutrition when they feel hungry. This was statistically significant (p=0.017).Antenatal mothers tend to ingest high-carbohydrate diet in the later stages of pregnancy which might increase the risk of Gestational Diabetes Mellitus. Thus there is a discrepancy in the attitude towards GDM and practice women follow. Even though majority gave importance to screening of GDM, most of them didn't have in-depth knowledge about the condition. As far as sticking to dietary regimen goes, majority of women in pregnancy do not follow healthy dietary modification.

The results of few studies on effects of dietary modification indicate a good dietary compliance even up to 77.6% [11,12]. A meta-analysis revealed that dietary intervention given throughout pregnancy along with physical activity tends to be more effective than following physical activity alone [13].

From the knowledge, attitude and practice of participants towards GDM and its control, it is evident that the antenatal mothers of this region lack knowledge and attitude towards GDM and they should be educated properly in order to have a better practices which in turn results in delivery of a healthy baby.

5. CONCLUSION

This study about the status of knowledge, attitude and practices towards GDM was revealed knowledge was insufficient among the participants. This might have an adverse effect on maternal and foetal well being. Education of antenatal women supporting the welfare of baby and the mother should be provided at all levels of Reproductive Health Program. There is a need to improve the antenatal patient's knowledge on GDM. If knowledge about GDM increases among pregnant women they may be motivated to have an attitudinal change resulting in better practices like compliance for management protocols including dietary modifications, not defaulting on medications and getting regular follow-up. This may result in improved pregnancy outcomes.

CONSENT

The consent of the antenatal participants was taken and confidentiality was ensured.

ETHICAL APPROVAL

Ethics clearance from the Institutional Ethics Committee (IEC) was applied for and sanctioned.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Metzger BE, Buchanan TA, Coustan DR, De Leiva A, Dunger DB, Hadden DR, Hod M, Kitzmiller JL, Kjos SL, Oats JN, Pettitt DJ. Summary and recommendations of the fifth international workshop-conference on gestational diabetes mellitus. Diabetes Care. 2007;30(Supplement 2):S251-60.
2. World Health Organization. Definition, diagnosis and classification of diabetes mellitus and its complications: report of a WHO consultation. Part 1, Diagnosis and classification of diabetes mellitus. World Health Organization; 1999.
3. Islam B, Islam MF, Nyeem MA, Mannan MA, Neaz AA. Knowledge and attitude

regarding gestational diabetes mellitus (GDM) among obese pregnant women coming for antenatal checkup at a tertiary care hospital. IJCS. 2017;5(5):179-89.

4. Seshiah V, Balaji V, Balaji MS, Paneerselvam A, Arthi T, Thamizharasi M, Datta M. Prevalence of gestational diabetes mellitus in South India (Tamil Nadu): a community based study. JAPI. 2008;56:329-3.
5. Kjos SL, Buchanan TA. Gestational diabetes mellitus. New England Journal of Medicine. 1999;341(23):1749-56.
6. Khanpaye A, Abdoullahi A, Riahipour B, Mohebifar M, Mahmoodi R, Shirmardi S, Madmoli M. Evaluation of Knowledge, Attitude and Performance Regarding Gestational Diabetes Mellitus in Southwest of Iran. Journal of Pharmaceutical Research International. 2019;1-6.
7. El-Dessouki KH, Kamal NN, Refaie SA, Hanna MR. Knowledge, attitude and practice regarding nutrition among pregnant women, Minia City, Egypt.
8. Shriraam V, Rani MA, Sathiyasekaran BW, Mahadevan S. Awareness of gestational diabetes mellitus among antenatal women in a primary health center in South India. Indian Journal of Endocrinology and Metabolism. 2013; 17(1):146.
9. Hirst JE, Tran TS, Do MA, Rowena F, Morris JM, Jeffery HE. Women with gestational diabetes in Vietnam: a qualitative study to determine attitudes and health behaviours. BMC Pregnancy and Childbirth. 2012;12(1): 1-0.
10. Hawkins JS. Glucose monitoring during pregnancy. Current Diabetes Reports. 2010;10(3):229-34.
11. Khoury J, Henriksen T, Christophersen B, Tonstad S. Effect of a cholesterol-lowering diet on maternal, cord, and neonatal lipids, and pregnancy outcome: a randomized clinical trial. American Journal of Obstetrics and Gynecology. 2005;193(4): 1292-301.
12. Thornton YS, Smarkola C, Kopacz SM, Ishoof SB. Perinatal outcomes in nutritionally monitored obese pregnant women: a randomized clinical trial. Journal of the National Medical Association. 2009; 101(6):569-77.
13. Thangaratinam S, Rogozińska E, Jolly K, Glinkowski S, Duda W, Borowiack E, Roseboom T, Tomlinson J, Walczak J, Kunz R, Mol BW. Interventions to reduce or prevent obesity in pregnant women: a systematic review. NIHR Health Technology Assessment programme: Executive Summaries; 2012.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/75018