Journal ofMedical Care Research and Review
Received 5 Oct 2020 | Accepted 28 Nov 2020 | Published Online 30 Nov 2020

DOI: https://doi.org/10.15520/mcrr.v3i11.155
JMCRR 03 (11), 467–475 (2020)

ISSN (O) 2589-8949 | (P) 2589-8930 IF:0.08

ORIGINAL ARTICLE

Prevalence of Gestational Diabetes in Some Selected Slums of Dhaka City

Faruk Ul Islam[1*] | Hamida Khanum[2]

[1]American International University-Bangladesh, Dhaka.

[2]Parasitology Branch, Department of Zoology, University of Dhaha, Dhaka 1000,

Abstract

Aims: The present study descriptive type of cross sectional study was conducted to explore the prevalence of Gestational diabetes mellitus (GDM) in some selected slums of Dhaka city with a sample size of 236. The study population was pregnant women in Dhaka city, their socio-demographic characterist, the family and obstetric history (current and previous) related variable of the respondents and assess the clinical test related variable. **Study design:** The study population were pregnant women in Dhaka city. Non-randomized, purposive sampling technique was followed for this study. A semi structured, pre-tested, modified and interviewer administered questionnaire was used to collect the data.

Place and duration of study: Pregnant mother in 14 number outfall slum in Dhaka city. The study period was four months started from February 2017 to May 2017.

Results: It was found that, the majority of the respondents (56.8%) were in the age group 16-25 years followed by 38.6%, 2.1% and 2.5% were in age group 26-35 years,<15 years and >35 years respectively with mean age 23.74 ± 5.644 years. Most of the respondents (78%) were Muslim. Among the respondents 53% had primary education, 12% had SSC, 4% HSC, 3% had education of graduate and above, 28% respondents were illiterate. Among the respondents, 78.8% were housewife, 7.6% and 3.8% were engaged in service and business and rest 9.8% were day laborer. Out of 236 respondents, 22.5% had diabetes in their family and 14% respondents had previous history of GDM. Among them 72.9% had normal delivery while, 27.1% had caesarean section. Study also revealed that of the bad obstetric history (BOH) 25.8% had miscarriage, 3.0% still birth, 6.8% preterm baby and 3.4% Intra Uterine Death (IUD). Study also showed that 9.3% of the respondents had GDM, and 13.1% of the respondents had hypertension, 61.9% anemia, 8.1% jaundice, 20.3% edema, 35.6% had frequent urination.

Conclusion: There was an association of age with Fasting Blood Glucose (FBG) level which was statistically significant with P value< 0.014. As GDM is a medical problem and sometimes threatened the life of the mother and baby.

Keywords: Gestational diabetes mellitus, age, obstetric history, Type 2 Diabetes Mellitus

1 | INTRODUCTION

Over the past few years a growing prevalence of GDM has also been observed in the hospitals of Bangladesh. But information is scanty on risk factors and pregnancy outcome. Therefore this study had focused on some aspects relevant to risk factors and pregnancy outcomes of GDM mothers[6].Though there has been a significant decline of infant and child morality the maternal death ratio is still high at over 380 per 100,000 live births [7].The nutritional status of adolescent girls and women is a key factor in the persistence of malnutrition in Bangladesh. Low birth weight is estimated to affect 30-50 percent of infants[8] . About 70% of the women suffer from nutritionally deficiency anemia.[9]Bangladesh has been experiencing an epidemiological transition from communicable diseases to non-communicable diseases (NCD). Presently, Bangladesh does not have a community based public health program for NCDs. Only hospital based service, although poor, is available[10].

The Health, Nutrition, Population Sector Program (HNPSP) has identified three NCDs-cancer, cardiovascular diseases and diabetes mellitus-as major public health problems. Looking at the surveillance finding worldwide WHO has recommended to list prevalence of diabetes as one of the basic health indicator for its member states.[11]Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced[12] .

Certain genetic markers have been shown to increase the risk of developing Type 1 diabetes. Type 2 diabetes is strongly familial, but it is only recently that some genes have been consistently associated with increased risk for Type 2 diabetes in certain populations. Both types of diabetes are complex diseases caused by mutations in more than one gene, as well as by environmental factors. According to WHO in 2004, at least 171 million people worldwide had diabetes; this figure is likely to be more than double by 2030. WHO predicts 170% increase in the number of people with diabetes for the developing countries. The greatest increase is projected in India (195%) [13].

The magnitude of diabetes remains unknown due to lack of countrywide survey. Some studies showed that the prevalence is higher in urban areas. In a recent study in Bangladesh a higher prevalence of diabetes was found in urban (8.1%) compared with rural populations (2.3%) [14]. GDM as mentioned is any form of diabetes mellitus or impaired glucose tolerance (IGT) or impaired fasting glucose with first onset or first recognition during the index pregnancy. Thus the diagnosis of GDM is independent of possibility that diabetes or glucose intolerance may have antedated the pregnancy. As diabetes or glucose intolerance in women is more frequently discovered during pregnancy WHO has recommended including such cases under the definition of GDM. Such a broad definition has a great practical value and has boosted research on GDM [15].

Pregnancy is normally attended by progressive insulin resistance that begins near mid-pregnancy and progresses through the third trimester. The fact that insulin resistance rapidly abates following delivery suggests that the major contributors to this state of resistance are placental hormones. Moreover pancreatic cells normally increase their insulin secretion to compensate for the insulin resistance of pregnancy. As a result, changes in circulating glucose levels over the course of pregnancy are quite small compared with the large changes in insulin sensitivity [16].

In the aftermath of increasing prevalence of type 2 diabetes in Bangladesh, it is reasonable to postulate that there is a growing prevalence of gestational diabetes. Bangladeshi women have been seen to have higher IGT than their male counterpart [17]. Compared to the other South Asian population Bangladesh has higher birth rate [18] and has the prevalence of multiparty. Perinatal mortality and infant mortality is also high in Bangladesh [19]. Though there is no published report on the prevalence of preeclampsia in Bangladesh the Obstetric and Gynecological Society Bangladesh (OGSB) estimates 16% of maternal death from eclampsia. In addition,

Supplementary information The online version of this article (https://doi.org/10.15520/mcrr.v3i11.155) contains supplementary material, which is available to authorized users.

Corresponding Author: *Faruk Ul Islam*
American International University-Bangladesh, Dhaka.

according to OGSB obstructed labour accounts for 8% of maternal death. Frequency of congenital malformations and low birth weight also appears to be higher in Bangladesh [20].

Careful search of literature provided no data on prevalence of GDM based on the time of diagnosis in Bangladesh perspectives. In spite of reports that claim 40-66% of gestational diabetes can be detected in early pregnancy there have been conflicting studies on the usefulness of glucose screening at early pregnancy. Nevertheless one could reasonably suggest that women with gestational diabetes in early pregnancy could benefit from earlier metabolic control as well as prediction of pregnancy and fetal complication in this group [21]. A study conducted in India found different types of fetal complication at different level of glycaemic control. With improved glycaemic control and advanced neonatal care perinatal adversities in GDM have approached that of non diabetic mothers [22].

Justification of the study:

Women with GDM are more likely to give birth to macrosomic or large-for-gestational-age infants. GDM may results in obstructed labour, the death of the mother and the baby and birth injury for the infants. GDM also has long-term health impact, with more than 50% of women with GDM going on to develop type2 diabetes within 5-10 years of delivery [4]. Moreover; infants of women with GDM have a higher prevalence of overweight and obesity, and higher risk of developing type2 diabetes later in life. These sorts of patients would have a suffering throughout life time with different complications of the disease.

In Bangladesh diabetes has become highly prevalent and is growing at a faster rate. Despite this evidence, GDM remains a neglected maternal health issue among policy makers. This small scale study will help other researchers to evaluate more border study that will help to overcome the community from this high risk obstetric condition.

2 | METHODOLOGY

The study population were pregnant women in Dhaka city. Pregnant mother in 14 number outfall slum in Dhaka city. Non-randomized, purposive sampling technique was followed for this study.

2.1. Questionnaire: A semi structured, pre-tested, modified and interviewer administered questionnaire was used to collect the data.

2.2. Place and duration of the study: The study period was four months started from February 2017 to May 2017. The study population was pregnant women in Dhaka city. The study was carried out in a selected community Dholpur, Jatrabari of Dhaka city. Ward # 85 which includes 14 # Outfall, Dhalpur where include: Adarsha Basti, 96 Ghar (staff quarter), 38 Ghar (tin shed), Nabu Basti, Pora Basti including Mannan and Madhya Basti, City Polly, Aynal Basti and Talegue Basti.

2.3.Study design and type of study: The cross sectional type of descriptive study was conducted in order to find out the prevalence of gestational diabetes in some selected slums of Dhaka city with a sample size of 236 pregnant women. Current obstetric history related variables, previous obstetric history related variables, clinical test related variables, IEC related variables were counted.

2.4: Inclusion and Exclusion Criteria: The study population was included only the pregnant women in Dhaka city. Unwilling to participate in the study, Women physically or mentally handicapped were excluded.

2.5: Data analyses: All the data were entered and analyzed by using Statistical Packages for Social Science (SPSS) software version 19.0. Proportion was presented by frequency and cross tabulation analysis.

3 | RESULTS

In the present investigation, 56.8% respondents belonged to16-25 years age group, followed by 38.6% belonged to 26-35 years age group, 2.1% belonged to <15 years age group and 2.5% belonged to >35 years age group with mean age 23.74 ± 5.644 years

(Table 1). Among the respondents 53% had primary education followed by 12% SSC, 4% HSC, 3% graduate and above and rest 28% respondents were illiterate (Fig. 1). Present study showed that 78.8% respondents were housewife, 7.6% involved in service, 3.8% were engaged in business and rest 9.8% were day laborer (Table 1).

Results showed that half of the respondents (50%) had only 1 child followed by 30.5% had 2, 14.4% had 3, 4.2% had 4 and only 0.8% had 5 children (Fig. 2). It was found that 49.6% of the respondents used supply water, 41.1% used normal water from ponds and rivers and rest of them (9.3%) used boiled water. It was observed that 22.5% of the respondents had diabetes in the family and rest 77.5% did not have.

TABLE 1: Distribution of the respondents by age (n=236)

Age in years	Frequency	Percentage (%)
<15	5	2.1
16-25	134	56.8
26-35	91	38.6
>35	6	2.5
Total	236	100.0

TABLE 2: Byoccupation

House Wife	186	78.8
Service	18	7.6
Business	9	3.8
Day laborer	23	9.8
Total	236	100.0

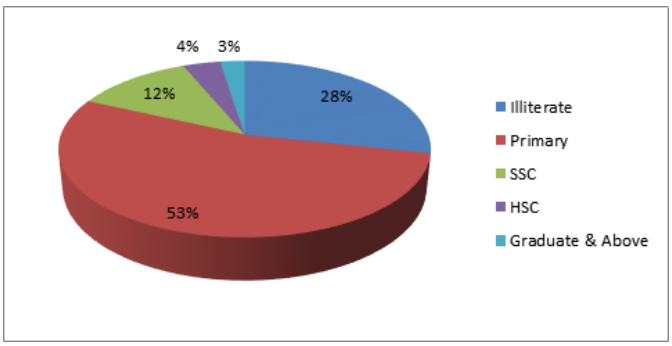

FIGURE 1: Distribution of the respondents by education (n=236)

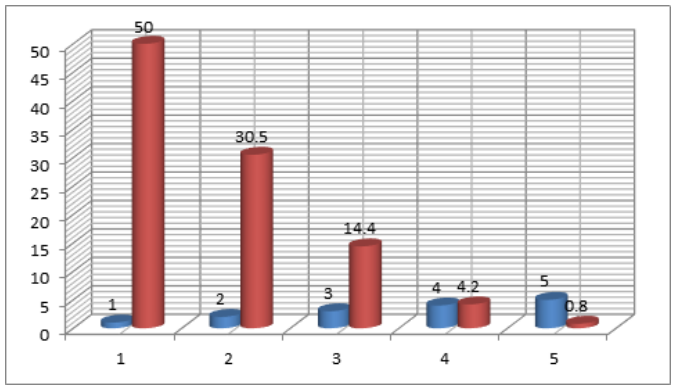

FIGURE 2: Distribution of the respondents by number ofchildren (n=236)

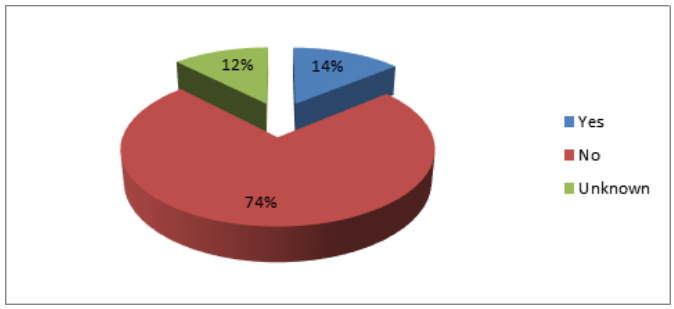

FIGURE 3: Distribution of therespondents by previous historyof GDM (n=236)

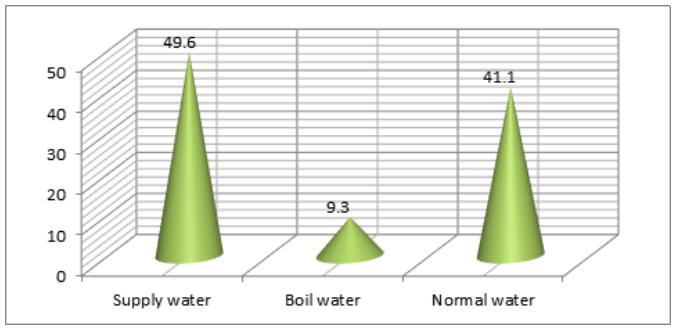

FIGURE 4: Distribution of therespondents by previous historyof GDM (n=236)

It was found that 49.6% of the respondents used supply water, 41.1% used normal water from ponds and rivers and rest of them (9.3%) used boiled water (Fig. 4). Only 14% respondents had previous history of GDM belonged to 73.7% did not have and rest 12.3% did not know about GDM (Fig. 3). Most of the respondents (72.9%) previous mode of delivery was normal and rest of them (27.1%) was caesarean section (Table 4). The present study showed that of the 25.8% respondents had history of miscarriage followed by 3% was still birth, 6.8% was preterm

baby, 4.6% was big baby and 3.4% was IUD, and rest of them (56.4%) was no such type of history. Study found that (9.3%) of the respondents had GDM and rest of them (90.7%) did not have. Found that (13.1%) of the respondents had hypertension and rest of them (86.9%) did not have (Table 4).

TABLE 3: Distribution of the respondents by diabetes inthe family (n=236)

Diabetes in the family	Fre-quency	Percentage (%)
Yes	53	22.5
No	183	77.5
Total	236	100.0

Found that the (54.6%) GDM developed in 3^{rd} trimester, (31.8%) in 2^{nd} trimester and (13.6%) developed in 1^{st} trimester. Shows that (61.9%) of the respondents had anaemia and rest of (38.1%) did not have. It was found that (8.1%) of the respondents had jaundice and rest (91.9%) did not have. In the present investigation, it was found that, (35.6%) of the respondents suffered from frequent urination and rest (64.4%) did not have, (20.3%) of the respondents had oedema and rest (79.7%) did not have. It reveals that majority of the respondents (80.9%) had knowledge about GDM and rest of them (19.1%) did not have knowledge about it. Shows that (5.9%) of the respondents had visual problem and rest (94.1%) did not have. It was found that (11.9%) of the respondents had delayed healing ulceration and rest of them (88.1%) did not have . Study found that (9.3%) of the respondents had GDM and rest of them (90.7%) did not have (Table 4).

TABLE 4: Distribution of the respondents by previous modeof delivery (n=236)

Variables	Frequency	Percentage (%)
Normal	172	72.9
Caesarean	64	27.1
Total	236	100.0

Result shows multiple responses of the respondents.

In the present study, (11.4%) of the respondents obtained information about GDM from radio followed by (37.7%), (8.5%), (73.3%), (17.4%), (47.9%),

Previous bad obstetric history:

Miscarriage	61	25.8
Still birth	7	3.0
Preterm baby	16	6.8
Big baby	11	4.6
IUD	8	3.4
No history	133	56.4
Total	**236**	**100.0**

Distribution of the respondents by

Normal FBG	214	90.7
GDM	22	9.3
Total	**236**	**100.0**

GDM according to trimester (n=22)

1st trimester	3	13.6
2nd trimester	7	31.8
3rd trimester	12	54.6
Total	**22**	**100**

by GDM (n=236)

Normal FBG	214	90.7
GDM	22	9.3
Total	**236**	**100.0**

TABLE 5: Distribution of the respondents by hypertension (n=236)

Variables	Frequency	Percentage (%)
Yes	31	13.1
No	205	86.9
Total	236	100.0

by anaemia (n=236)

Yes	146	61.9
No	90	38.1
Total	**236**	**100.0**

by jaundice (n=236)

Yes	19	8.1
No	217	91.9
Total	**236**	**100.0**

By oedema

Yes	48	20.3
No	188	79.7
Total	**236**	**100.0**

by frequent urination (n=236)

Yes	84	35.6
No	152	64.4
Total	**236**	**100.0**

by delayed healing ulceration (n=236)

Yes	28	11.9
No	208	88.1
Total	**236**	**100.0**

TABLE 6: Distribution of the respondents by source ofinformation (n=236)

Variables	Frequency	Percentage (%)
Radio	27	11.4
TV	89	37.7
Poster	20	8.5
Health worker	173	73.3
Peer feedback	41	17.4
Mother's group meeting	113	47.9
From NGO worker	166	70.3
From Hospital	76	32.2

(70.3%) and (32.2%) from TV, poster, health worker, peer feedback, mothers group meeting, from NGO worker and from hospital respectively (Table 6). Also showed that 9.3% of the respondents had GDM and rest 90.7% had normal FBG. There is an association among age and FBG level was found and it was statistically significant with P value <0.014 (Table 7).

4 | DISCUSSION

Gestational diabetes mellitus (GDM) is defined as carbohydrate intolerance with onset or recognition during pregnancy [54]. GDM has been seen to be associated with growing pregnancy complication by hospital observation in Bangladesh. Urban prevalence of GDM is predicted even much more while the rural prevalence was found 6.8% and 8.2% according to FBG and 2hBG respectively[2] *GDM* affects up to 15% of pregnant women *worldwide* [49]. In Bangladesh a recent study conducted in a rural community found the overall prevalence of gestational diabetes mellitus is 6.8% with a range of (1.88-9.32) and 8.2% with a range of (3.74-12.64) according to FBG and 2hBG, respectively. Bangladesh had 3.2 million of diabetic patients in 2000 and the number is expected to increase up to 11.1 million by 2030 and placing her among the top10 countries with diabetes [10].

This descriptive type of cross sectional study was conducted to assess the prevalence of gestational diabetes in slums dwellers of Dhaka city with a sample size of 236. It was found from the study that the majority of the participants, 56.8% were in the age group 16-25 years followed by 38.6%,2.1% and 2.5% were 26-35 years , <15 years and >35 years respectively with mean age 23.74 ± 5.644 years. This study is almost similar to the study conducted on Prevalence and risk factors for gestational diabetes assessed by universal screening by Di Cianni Get al.[32].

Most of the respondents 78% were Muslim, 16.1% and 5.9% were Hindu and Christian respectively. Among the respondents 53% had primary education followed by 12% SSC, 4% HSC, 3% graduate & above and rest 28% respondents were illiterate. This study is almost similar to the study conducted on Prevalence of gestational diabetes mellitus in urban and rural Tanzania by Akwilina et al.[52]. Among the respondents 78.8% were housewife, 7.6% and 3.8% were engaged in service and business and rest 9.8% were day labour.79.2% of the respondents.

It also showed that half of the respondents 50% had only 1 child followed by 30.5% had 2, 14.4% had 3, 4.2% had 4 and only 0.8% had 5 children. It was found that 49.6% of the respondents used supply water, 41.1% used normal water from rivers and ponds and rest 9.3% used boiled water. It was found that majority of the respondents 22.5% had diabetes in the family and rest 75.5% did not have. Study showed that among the respondents 14% had previous history of GDM, 73.7% did not have and rest 12.3% was unknown about it. Those findings are reverse to the study conducted on Socio-demographic Risk Factors of Gestational Diabetes Mellitus by Radhia Khan et al.[50] in Pakistan. Due to different life style pattern of two countries the history of GDM varies to some extent.[50]

TABLE 7: Theassociation between age and FBG level (n=236)

Variables	Frequency	Percentage (%)
Radio	27	11.4
TV	89	37.7
Poster	20	8.5
Health worker	173	73.3
Peer feedback	41	17.4
Mother's group meeting	113	47.9
From NGO worker	166	70.3
From Hospital	76	32.2

Study revealed that majority of the respondents (80.9%) had heard about GDM and rest of them 19.1% did not hear. This result is almost similar to the study conducted on Gestational diabetes mellitus: Pilot study on patient's related aspects by Zahid Hussain et al [53]. Archives of Pharmacy Practice, 2014 – Medknow.[53] Showed that 11.4% of the respondents source of information about GDM was radio followed by 37.7%, 8.5%, 73.3%, 17.4%, 47.9% 70.3% and 32.2% was TV, poster, health worker, peer feedback, mothers group meeting, from NGO worker and from hospital respectively.

There is an association among age and FBG level was found and it was statistically significant with P value <0.014. A standard treatment guideline including referral instruction is to be prepared and made available to the health professional so that they can identify GDM as well as make a proper birth plan for pregnancy with GDM. Women with GDM should be followed up after delivery in order to monitor hyperglycemic status and so advised accordingly. Should be arrange a awareness program of complication of GDM so that mother can know the actual danger and they can alert. Further studies are needed with long duration and large sample size for more accurate results.

5 | CONCLUSION AND RECOMMENDATIONS :

Historically, infants born to mother with diabetes (GDM) have significantly greater risk for spontaneous abortion, stillbirth, congenital malformations, obstructed labour, and perinatal mortality and morbidity. GDM also has long-term health impact, more than 50% of women with GDM undergo develop type 2 diabetes later in life. Commonly recognized risk factors for GDM are prevalent in the study population. Women diagnosed with GDM at an early pregnancy were more likely to be treated with insulin. Hypertension, caesarean section and preterm delivery were more prevalent in the women with GDM.

A standard treatment guideline including referral instruction is to be prepared and made available to the health professional so that they can identify GDM as well as make a proper birth plan for pregnancy with GDM. Women with GDM should be followed up after delivery in order to monitor hyperglycemic status and so advised accordingly. Should be arrange a awareness program of complication of GDM so that mother can know the actual danger and they can alert. Further studies are needed with long duration and large sample size for more accurate results.

. **CONSENT AND ETHICAL APPROVAL:** Permission was taken from the Ethical Committee at American International University Bangladesh before starting the study, i.e. collection of data. The respondents, were clearly informed on the aims and objectives of the study. As per international standard or university standard, respondents' written consent has been collected and preserved by the authors.

ACKNOWLEDGEMENT

We like to express our sincere, deepest and heartfelt gratitude to the Faculty of Arts and Social Science, Public Health Department, American International University- Bangladesh, permitted and supported to conduct this research for the MPH courses.

6 | REFERENCES:

1. Metzger BE, Coustan DR. Summary and recommendations of the Fourth International Workshop-Conference on Gestational Diabetes Mellitus. The Organizing Committee. Diabetes Care 1998; 21 (2):161-67.
2. Sayeed MA, Mahtab H, Khanam PA, Begum R, Banu A, Azad Khan AK. Diabetes and hypertension in pregnancy in a rural community of Bangladesh: a population-based study. Diabet Med 2005; 22(9):1267-71.
3. Making Pregnancy Safer, Family and Community Health, World Health Organization, Bnagladesh, Available at http:// www.whoban.org/familycomhealth.html Accessed on January, 2015.
4. Ben Haroush A, Yogev Y, Hod M. Epidemiology of gestational diabetes mellitus and its association with Type 2 diabetes. Diabet Med 2004; 21(2):103-13.
5. International diabetic foundation,Diabetic Atlas,second edition. Available athttp://www.idf.org/ diabetesatlas/5e/es/prologo2000-idf.org Accessed on April, 2015.
6. The World Bank in Bangladesh, Country brief, July 2005. Available at http:// siteresources.worldbank.org/ INTBANGLADESH/Resources/ BD06.pdf.Accessed on February, 2015.
7. World Health Organization Statistics, 2005. Part 1.
8. Nutrition, Health and Nutrition, UNICEF Bangladesh. Available at http:// www.unicef.org/bangladesh/ healthnutrition406.htm.Accessed on January, 2015.
9. NATIONAL POLICY ON MATERNAL HEALTH. Ministry of Health, Government of the People's Republic of Bangladesh .Available at http:// www.bangladeshgateway.org/ meternalhealth.php? PHPSESSID=c2859da4f1c8b5579991766219f d2c06. Accessed on March, 2015.
10. Health Profile of Bangladesh, World Health Organization, Bangladesh. Available athttp://www.whoban.org/ countryhealthprofile.html, Accessed on March, 2015.
11. King H, Aubert RE, Herman WH. Global burden of diabetes, 1995-2025: prevalence, numerical estimates, and projections. Diabetes Care 1998; 21(9):1414-31.
12. Alberti KG, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus provisional report of a WHO consultation. Diabet Med 1998; 15(7):539- 53.
13. Global Burden of diabetes, Press Release WHO /63,14 September 1998. Available at http://www.who.int/inf-pr-1998/ en/pr98-63.html Accessed on February, 2015.
14. Hussain A, Rahim MA, Azad Khan AK, Ali SM, Vaaler S. Type 2 diabetes in rural and urban population: diverse prevalence and associated risk factors in Bangladesh. Diabet Med 2005; 22(7):931-36.
15. Abu SM, Ali L, Hussain MZ, Rumi MA, Banu A, Azad Khan AK. Effect of socioeconomic risk factors on the difference in prevalence of diabetes between rural and urban populations in Bangladesh. Diabetes Care 1997; 20(4):551- 55.
16. Buchanan TA, Xiang AH. Gestational diabetes mellitus. J Clin Invest 2005; 115(3):485-91.
17. Ahmed S, Khanum PA, Islam A. Maternal morbidity in rural Bangladesh: where do women go for care? [WP113,1998] Available athttp://www.icddrb.org/pub/ publication.jsp.Accessed on April, 2015.
18. Bangladesh Bureau of Statistics.Statistical Pocket Book of Bangladesh 2000. Ed; Singha AC,Statistical Division, Ministry of Planning, Government Of The People's Republic Of Bangladesh.

19. Low Birth Weight of a Meeting, Dhaka, Bangladesh,14-17June 1999.United nation Administrative Committee On Coordination, Sub Committee on Nutrition, Nutrition Policy Paper No.18 February2000 (page 7) . Available at http:// www.unsystem.org/scn/Publications/NPP/ npp18lbw.pdf. Accessed on February, 2015(Page no. 7 of 56).
20. Begum MR, Begum A, Quadir E, Akhter S, Shamsuddin L. Eclampsia: still a problem in Bangladesh. MedGenMed 2004; 6(4):52.
21. Meyer WJ, Carbone J, Gauthier DW, Gottmann DA. Early gestational glucose screening and gestational diabetes. J Reprod Med 1996; 41(9):675-79.
22. Banerjee S, Ghosh US, Banerjee D. Effect of tight glycaemic control on fetal complications in diabetic pregnancies. J Assoc Physicians India 2004; 52:109-13.
23. Verhaeghe J, Gestational diabetes mellitus: pathophisiology, screening and diagnosis, and management. Diabetes and Pregnancy. European Practice in Gynecology and Obstetrics .2004.Page (15-27).
24. Fuchtenbusch M, Ferber K, Standl E, Ziegler AG. Prediction of type 1 diabetes postpartum in patients with gestational diabetes mellitus by combined islet cell autoantibody screening: a prospective multicenter study. Diabetes 1997; 46(9):1459-67.
25. Haig D. Genetic conflicts in human pregnancy. Q Rev Biol 1993; 68(4):495- 532.
26. American College of Obstetricians and Gynecologists. Gestational Diabetes, Practice Bulletin no. 30. 2001.
27. Coustan DR. Diagnosis of gestational diabetes. What are our objectives? Diabetes 1991; 40 (2):14-17.
28. WHO Ad Hoc Diabetes Reporting Group. Diabetes and impaired glucose tolerance in women aged 2039 years. World Health Stat 1992; 45: 321327.
30. Jervell J .An Update on Diabetes Including HbA1c and microalbumin. August 2000, First edition.
31. Berkowitz GS, Lapinski RH, Wein R, Lee D. Race/ethnicity and other risk factors for gestational diabetes. Am J Epidemiol 1992; 135(9):965-73.
32. Di Cianni G, Volpe L, Lencioni C, Miccoli R, Cuccuru I, Ghio A et al. Prevalence and risk factors for gestational diabetes assessed by universal screening. Diabetes Res Clin Pract 2003; 62(2):131-37.
33. Chan LY, Wong SF, Ho LC. Diabetic family history is an isolated risk factor for gestational diabetes after 30 years of age. Acta Obstet Gynecol Scand 2002; 81(2):115-17.
34. Davey RX, Hamblin PS. Selective versus universal screening for gestational diabetes mellitus: an evaluation of predictive risk factors. Med J Aust 2001; 174(3):118-21.
35. Toms GC, Fairbank J, Day SL, Fisher M, Beedham T, Monson JP. Outcome of gestational diabetes in Bengali Asians living in an east London health district. Diabetes Res Clin Pract 1992; 18(1):55-60.
36. Begum S, Huda SN, Musarrat N, Ahmed S, Banu LA, Ali SM. Nutritional status and birth outcomes of the diabetic and non-diabetic pregnant women. Bangladesh Med Res Counc Bull 2002; 28(3):97-103.
37. Nasrat AA, Augensen K, Abushal M, Shalhoub JT. The outcome of pregnancy following untreated impaired glucose tolerance. Int J Gynaecol Obstet 1994; 47(1):1-6.
38. Ramtoola S, Home P, Damry H, Husnoo A, Ah-Kion S. Gestational impaired glucose tolerance does not increase perinatal mortality in a developing country: cohort study. BMJ 2001; 322(7293):1025-26.
39. Moses RG, Calvert D. Pregnancy outcomes in women without gestational diabetes mellitus related to the maternal glucose level. Is there a continuum of risk? Diabetes Care 1995; 18(12):1527-33.
40. Dunne FP, Brydon PA, Proffitt M, Smith T, Gee H, Holder RL. Fetal and maternal outcomes in Indo-Asian compared to caucasian women with diabetes in pregnancy. QJM 2000; 93(12):813-18.

41. Dornhorst A, Nicholls JS, Welch A, Ali K, Chan SP, Beard RW. Correcting for ethnicity when defining large for gestational age infants in diabetic pregnancies. Diabet Med 1996; 13(3):226-31.
42. Crowther CA, Hiller JE, Moss JR, McPhee AJ, Jeffries WS, Robinson JS. Effect of treatment of gestational diabetes mellitus on pregnancy outcomes. N Engl J Med 2005; 352(24):2477-86.
43. Szilagyi A, Feledi E, Csaba I, Pejtsik B. Early screening of gestational diabetes in high risk pregnancy cases. Orv Hetil 1989; 130(16):839-42.
44. Ramachandran A, Snehalatha C, Clementina M, Sasikala R, Vijay V. Foetal outcome in gestational diabetes in south Indians. Diabetes Res Clin Pract 1998; 41(3):185-89.
45. Rizvi JH, Rasul S, Malik S, Rehamatuallh A, Khan MA. Experience with screening for abnormal glucose tolerance in pregnancy: maternal and perinatal outcome. Asia Oceania J Obstet Gynaecol 1992; 18(2):99-105.
46. Khan KS, Hashmi FA, Rizvi JH. Are non-diabetic women with abnormal glucose screening test at increased risk of pre-eclampsia, macrosomia and caesarian birth? J Pak Med Assoc 1995; 45(7):176-79.
47. Ahkter J, Qureshi R, Rahim F, Moosvi S, Rehman A, Jabbar A et al. Diabetes in pregnancy in Pakistani women: prevalence and complications in an indigenous south Asian community. Diabet Med 1996; 13(2):189-91.
48. Vangen S, Stoltenberg C, Holan S, Moe N, Magnus P, Harris JR et al. Outcome of pregnancy among immigrant women with diabetes. Diabetes Care2003; 26(2):327-32.
49. Coustan DR. Diagnosis of gestational diabetes. What are our objectives? Diabetes 1991; 40(2):14-17. Available on https:// www.duo.uio.no/bitstream/handle/.../ RuhinaxTasminxBiswas.pdf?Accessed on February, 2015.
51. Akter, S. Screening for gestational diabetes mellitus and its prevalence in Bangladesh. Available on www.researchgate.net/.../259472962.Accessed on February, 2015.
52. Akwilina W. Mwanri, Joyce Kinabo, Kaushik Ramaiya, Edith J.M. Feskens. Prevalence of gestational diabetes mellitus in urban and rural Tanzania.Available on www.ncbi.nlm.nih.gov/ pubmed/24367971Accessed on February, 2015.
53. Hussain, Z., Yusoff, Z.M., Sulaiman, S. Z. Gestational diabetes mellitus: Pilot study on patient's related aspects. Archives of Pharmacy Practice, 2014 – Medknow.
54. Seshiah V, Sahay BK, Das AK, Balaji V, Siddharth Shah, Samar Banerjee, A Muruganathan, Vitull K Gupta, Navneet Magon Diagnosis and Management of Gestational Diabetes Mellitus: Indian Guidelines (Chapter 44).
55. Seshiah V, Balaji V, Balaji MS, et al. Pregnancy and diabetes scenario around the world: India. Int J Gynaecol Obstet. 2009;104(Suppl 1):S35- 8
56. Gestational Diabetes Mellitus experience in BSMMU-Bangladesh by Muhammad Abul Hasanat at 12th European Diabetes Congress, September 15-17, 2016 Berlin, Germany.
57. Rashid FB, Khatoon H, Hasnat MA, Amin R, Azad AK. Perinatal Complications in Diabetes Mellitus with Pregnancy: Comparison between Gestational Diabetes Mellitus (GDM) and Diabetes Mellitus Prior to Pregnency. Mymensingh Med J. 2017 Jan;26(1):124-130.

How to cite this article: Islam F.U., Khanum H. **Prevalence of Gestational Diabetes in Some Selected Slums of Dhaka City**. Journal ofMedical Care Research and Review. 2020;467−475. https ://doi.org/10.15520/mcrr.v3i11.155