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Original Article

Prevalence of Gestational Diabetes in Jobholding and Housewives Women Associated with Limited Awareness of Healthcare in Faisalabad

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ABSTRACT

Background: Gestational diabetes mellitus (GDM) is a frequent complication of pregnancy, associated with significant maternal and neonatal risks. Awareness and education are critical for prevention, timely screening, and effective management, yet disparities in knowledge may exist across different sociodemographic groups. Understanding how occupational status and educational attainment influence awareness can inform targeted interventions in high-burden populations. Objective: To determine the prevalence of GDM and evaluate its association with awareness of healthcare among jobholding and housewife women in Faisalabad, Pakistan. Methods: A cross-sectional observational study was conducted over four months in outpatient departments of four tertiary hospitals. A total of 132 pregnant women aged 18–40 years in their second or third trimester were enrolled through convenience sampling. Diagnosis of GDM was confirmed using oral glucose tolerance testing. Awareness was measured using a validated 13-item questionnaire, classifying scores into good, average, or poor. Data were analyzed using chi-square tests and odds ratios, with statistical significance set at $p < 0.05$. Results: The prevalence of GDM was 23.5%. Women with ≥15 years of education had markedly lower prevalence (4%) compared with those with nine years of education (40.5%, $p < 0.001$). Working women reported higher awareness but also higher prevalence of GDM (OR 10.36, 95% CI: 4.25–25.2). Awareness was lowest among women with GDM, with 29% scoring poorly. Conclusion: GDM prevalence in Faisalabad is substantial, and educational level is strongly protective. Although working women demonstrated better awareness, their higher prevalence suggests occupational and lifestyle-related risks. Targeted health education and workplace-based maternal care programs are urgently needed.

Keywords: Gestational diabetes mellitus, awareness, maternal health, education, occupation, Pakistan.

INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as glucose intolerance first recognized during pregnancy, with severity ranging from impaired glucose tolerance to overt diabetes (1). It typically manifests in the second or third trimester as placental hormones contribute to increased insulin resistance, and prevalence has risen globally in parallel with the increasing burden of type 2 diabetes (2). In the United Kingdom, between 1% and 25% of pregnancies are complicated by GDM, while in South Asia, reported prevalence is substantially higher, reflecting differences in genetic susceptibility, maternal obesity, dietary patterns, and health system factors (3). The condition poses significant risks to both mother and child, including pre-eclampsia, cesarean delivery, macrosomia, and long-term development of type 2 diabetes (4). Given these adverse outcomes, early detection and effective management of GDM are critical components of antenatal care.

Although the biomedical mechanisms of GDM are well understood, maternal knowledge and awareness of the condition remain limited, particularly in low- and middle-income countries. Awareness gaps hinder timely screening, adherence to lifestyle modification, and effective utilization of healthcare resources (5). Studies from India and Bangladesh have demonstrated that many women lack sufficient knowledge about the causes, risk factors, and consequences of GDM, which contributes to late diagnosis and suboptimal management (6,7). Evidence further indicates that educational attainment and occupational status strongly influence health literacy. Working women often have greater access to health information and preventive care, while housewives may depend more on informal sources such as family or mass media, potentially reducing their awareness and self-care practices (8). These disparities highlight the importance of understanding how social determinants—particularly education and occupation—affect GDM awareness.

In Pakistan, the reported prevalence of GDM ranges widely, with some hospital-based studies documenting rates exceeding 20%, yet systematic evidence from specific urban populations such as Faisalabad remains scarce (9). Moreover, few studies have explored how awareness of GDM differs between job-holding women and housewives, despite clear evidence that socioeconomic and occupational status are determinants of maternal health outcomes. This knowledge gap is particularly important in contexts where antenatal education

programs are limited, and where cultural and structural barriers restrict access to healthcare information. Understanding awareness patterns in different subgroups of women could inform targeted interventions, improve screening uptake, and reduce the burden of maternal and neonatal complications.

The present study was therefore designed to estimate the prevalence of gestational diabetes and evaluate the level of awareness regarding healthcare among jobholding and housewife women in Faisalabad. By examining these associations, the study seeks to determine whether occupational status and educational background contribute to differences in awareness, and whether these differences have implications for GDM prevalence. We hypothesized that job-holding women and those with higher education levels would demonstrate greater awareness of GDM and consequently lower prevalence compared to housewives with less education.

MATERIALS AND METHODS

This investigation employed a cross-sectional observational design to assess the prevalence of gestational diabetes mellitus (GDM) and its association with healthcare awareness among pregnant women. The design was chosen to provide a snapshot of prevalence and awareness patterns in a defined population, allowing for direct comparison between job-holding women and housewives (10). The study was conducted in outpatient departments of multiple tertiary hospitals in Faisalabad, Pakistan, including Faisalabad Teaching Hospital, Faisal Hospital, Nusrat Fateh Ali Khan Hospital, and Madinah Teaching Hospital, over a four-month period following approval of the study protocol (11).

Participants were recruited from antenatal care clinics using a convenience sampling approach. Eligibility was restricted to pregnant women aged 18–40 years in their second or third trimester, reflecting the period of greatest diagnostic accuracy for GDM. Women were included across varying education levels, from junior secondary education to higher education. Exclusion criteria encompassed chronic systemic conditions such as cardiovascular disease, renal disorders, previously diagnosed type 2 diabetes or prediabetes, polycystic ovarian syndrome, and history of recurrent miscarriages, as these factors could confound the diagnosis or management of gestational diabetes (12,13).

Women presenting for routine antenatal visits were approached by trained data collectors, who explained the study in detail. Written informed consent was obtained in both English and Urdu, with assurances of voluntary participation, confidentiality, and no impact on clinical care. Screening for eligibility was performed through clinical records and history-taking, after which participants completed a self-administered, pretested, close-ended questionnaire adapted from previously validated tools (14). The instrument comprised 13 dichotomous items (yes/no) assessing knowledge of GDM risk factors, screening, treatment, and consequences. Scores were classified as good (9–13), average (5–8), or poor (0–4) levels of awareness. Diagnostic status for GDM was confirmed through hospital records based on oral glucose tolerance test (OGTT) results, applying to the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria (15).

To minimize bias, participants were enrolled consecutively until the target sample was achieved, and identical procedures were applied across all sites. The sample size was calculated using Rao soft software, targeting a 95% confidence level, 5% margin of error, and expected prevalence based on prior regional studies, yielding a minimum of 132 participants (16). Potential confounding factors such as maternal age, parity, and education level were recorded to allow stratified analyses. Data integrity was ensured by double-checking questionnaire entries and restricting data access to the principal investigators.

All responses were entered into SPSS version 20 for statistical analysis. Descriptive statistics summarized participant demographics, awareness levels, and prevalence estimates. Chi-square tests were applied to examine associations between occupation, education, and awareness, as well as between GDM status and these predictors. Statistical significance was defined at $p < 0.05$. Subgroup analyses were conducted to explore whether higher education or occupational status modified the relationship between awareness and prevalence. Missing data were minimal due to in-person administration and were excluded through listwise deletion.

Ethical approval was obtained from the Department of Rehabilitation Sciences, The University of Faisalabad, prior to study initiation. Permission was also secured from hospital administrations to conduct data collection, and participants were fully informed of their rights. The study adhered to the principles of the Declaration of Helsinki, ensuring respect for participants and protection of their health information (17).

RESULTS

Among the 132 pregnant women enrolled, the prevalence of gestational diabetes mellitus (GDM) was 23.5% (n = 31, 95% CI: 16.4–31.9), while 76.5% (n = 101) did not have the condition. The mean number of pregnancies was 2.6 ± 1.4, with a range of one to seven. Most participants reported limited educational attainment, with 59.8% having nine years of schooling, 31.1% completing 12 years, and only 9.1% attaining ≥15 years of education. Sources of information on GDM were dominated by informal networks: 37.1% cited family and friends, while only 18.2% reported doctors or health professionals as their primary source.

Occupation distribution revealed that 28.0% (n = 37) of participants were employed, whereas 72.0% (n = 95) were non-working. A strong association was observed between occupation and awareness level ($p < 0.001$). Among working women, 37.8% demonstrated good awareness, compared with 32.6% of non-working women. Conversely, poor awareness was far more common among housewives (12.6%) than working women (2.7%). When awareness was analyzed in relation to GDM status, significant disparities emerged. Only 12.9% of women with GDM displayed good awareness, compared with 59.4% of those without GDM ($p < 0.001$). Nearly one-third (29.0%) of

women with GDM had poor awareness, compared with just 5.0% of women without GDM. These findings underscore the inverse relationship between disease presence and health literacy.

Table 1. Descriptive statistics of education level, number of pregnancies, and source of information on GDM (n = 132)

Variable	Minimum	Maximum	Mean	SD
Education level (years*)	1	3	1.49	0.66
Number of pregnancies	1	7	2.64	1.43
Source of information**	1	4	2.47	1.07

Table 2. Prevalence of gestational diabetes in the study population (n = 132)

GDM Status	Frequency	%	95% CI for proportion
Yes	31	23.5	16.4 – 31.9
No	101	76.5	68.1 – 83.6

Table 3. Distribution of occupation (n = 132)

Occupation	Frequency	%	95% CI
Working	37	28.0	20.1 – 36.9
Non-working	95	72.0	63.1 – 79.9

Table 4. Education levels of participants (n = 132)

Education Level	Frequency	%	95% CI
9 years	79	59.8	51.0 – 68.1
12 years	41	31.1	22.8 – 39.4
≥15 years	12	9.1	4.2 – 14.0

Table 5. Number of pregnancies (n = 132)

Gravida	Frequency	%
1st pregnancy	36	27.3
2nd pregnancy	31	23.5
3rd pregnancy	30	22.7
4th pregnancy	22	16.7
5th pregnancy	7	5.3
6th pregnancy	5	3.8
7th pregnancy	1	0.8

Table 6. Source of information on GDM (n = 132)

Source of information	Frequency	%
Family and friends	49	37.1
Mass media	35	26.5
Doctor/health professional	24	18.2
Newspaper/magazine	24	18.2

Table 7. Association between occupation and awareness level (n = 132)

Occupation	Good Awareness	Average	Poor	Total	p-value (χ^2)
Working	14	22	1	37	<0.001
Non-working	31	52	12	95	
Total	45	74	13	132	

Table 8. Association between GDM status and awareness level (n = 132)

GDM Status	Good Awareness	Average	Poor	Total	p-value (χ^2)
Yes	4	18	9	31	<0.001
No	60	36	5	101	
Total	64	56	14	132	

Table 9. Association between GDM and education level (n = 132)

Education Level	GDM Present	GDM Absent	Total	p-value (χ^2)
9 years	17	25	42	<0.001
12 years	12	28	40	
≥15 years	2	48	50	
Total	31	101	132	

Table 10. Association between GDM and occupation (n = 132)

Occupation	GDM Present	GDM Absent	Total	p-value (χ^2)	Odds Ratio (95% CI)
Working	25	14	39	<0.001	10.36 (4.25–25.2)
Non-working	6	87	93		Reference
Total	31	101	132		

Table 11. Association between education level and occupation (n = 132)

Education Level	Working	Non-working	Total	p-value (χ^2)
9 years	18	24	42	0.017
12 years	13	27	40	
≥15 years	8	42	50	
Total	39	93	132	

Education level showed a strong protective association with GDM. Among women with nine years of education, 40.5% had GDM, compared with 30.0% of those with 12 years and only 4.0% of those with ≥15 years ($p < 0.001$). Higher education was associated with markedly lower GDM prevalence, reflecting a potential role of health literacy in prevention and early detection.

The relationship between occupation and GDM status was also highly significant ($p < 0.001$). Among working women, 64.1% (n = 25) were diagnosed with GDM, compared with only 6.5% (n = 6) of non-working women. The odds of having GDM were more than tenfold higher among employed women (OR 10.36, 95% CI: 4.25–25.2). Despite their higher prevalence, working women simultaneously reported better awareness levels than housewives, suggesting that employment may confer both risk (possibly due to stress or lifestyle factors) and a relative advantage in access to health information.

Finally, cross-tabulation of education and occupation showed significant associations ($p = 0.017$). Among housewives, 45.2% had ≥15 years of education compared with 20.5% of working women. However, despite higher educational attainment in the non-working group, awareness remained lower, reflecting the complex interplay of occupational exposure, social networks, and health literacy.

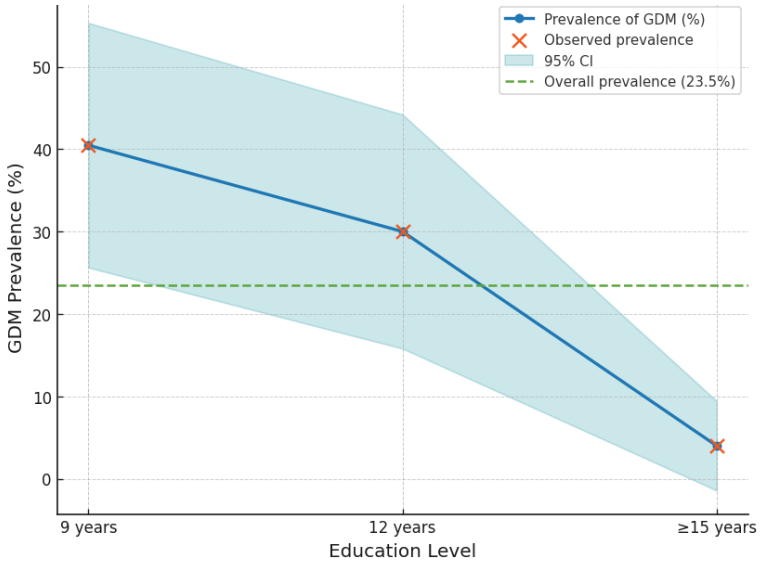

Figure 1 Prevalence of Gestational Diabetes by Education Level

The figure above demonstrates the prevalence of gestational diabetes across education levels. Women with nine years of schooling had the highest prevalence at 40.5%, while those with 12 years showed a reduced rate of 30.0%, and women with ≥15 years of education had only 4.0%. The plotted line highlights a clear inverse trend, with prevalence decreasing consistently as education level rises. The shaded confidence intervals indicate statistically robust differences, and the dashed line marks the overall prevalence of 23.5%. Clinically, this suggests that higher education is strongly protective, conferring nearly a tenfold reduction in GDM risk compared with minimal schooling.

DISCUSSION

This study assessed the prevalence of gestational diabetes mellitus (GDM) and its association with healthcare awareness among job-holding and housewife women in Faisalabad. The prevalence observed was 23.5%, which aligns with reports from other South Asian populations, where prevalence typically ranges between 15% and 25%, reflecting both genetic predisposition and limited healthcare access (18,19). In contrast, prevalence in European cohorts is significantly lower, often below 10%, emphasizing the disproportionate burden in developing regions (20). These differences highlight the necessity of region-specific strategies to address maternal health risks.

One of the most significant findings of this study was the strong inverse association between education level and GDM prevalence. Women with ≥15 years of education had only a 4% prevalence compared with 40.5% among those with nine years of schooling. These results are consistent with studies from Ethiopia and Bangladesh, which reported that maternal educational attainment was a major determinant of awareness, timely screening, and self-care practices in GDM (21,22). Education likely enhances health literacy, facilitates utilization of

antenatal services, and empowers women to adopt preventive behaviors. Conversely, limited education constrains knowledge about risk factors and warning signs, delaying diagnosis and management.

The relationship between occupation and GDM was more complex. Although working women had better awareness scores than housewives, their prevalence of GDM was unexpectedly higher, with an odds ratio exceeding ten. This paradox may be explained by occupational stress, longer working hours, sedentary job patterns, and nutritional imbalances associated with employed lifestyles (23). Previous studies in urban India have similarly suggested that professional women may face increased metabolic risks despite better health knowledge, reflecting the multifactorial nature of GDM pathogenesis (24). Nonetheless, the improved awareness among working women underscores the potential role of workplace-based education programs in improving maternal health literacy.

Awareness levels overall were suboptimal, particularly among women diagnosed with GDM, where almost one-third demonstrated poor awareness. This echoes findings from Saudi Arabia and Tanzania, where inadequate knowledge about GDM was prevalent despite high disease burden (25,26). Notably, informal networks such as family and friends were the most common sources of information in this cohort, surpassing healthcare professionals. This dependence on non-clinical sources raises concerns about misinformation and missed opportunities for evidence-based guidance. Structured antenatal education programs delivered through healthcare providers could bridge this gap and improve outcomes.

From a clinical perspective, these findings suggest that interventions should be stratified. Educational campaigns must target women with low schooling, as they represent the highest-risk group. Simultaneously, tailored strategies are needed for working women, focusing on stress management, workplace ergonomics, and balanced nutrition. Importantly, awareness should not only cover risk factors and screening but also emphasize long-term implications, since women with GDM face a substantially increased risk of type 2 diabetes in the years following pregnancy (27).

The strengths of this study include its focus on an urban Pakistani population and the direct comparison between jobholding and housewife women, a dimension often overlooked in prior literature. However, limitations must be acknowledged. The use of convenience sampling may reduce generalizability, and the cross-sectional design restricts causal inference. Moreover, data on diet, physical activity, and stress—potential confounders of GDM—were not collected, which could have provided further insight into the occupational differences observed.

In conclusion, this study demonstrates that GDM prevalence in Faisalabad is substantial and influenced by both educational attainment and occupational status. Higher education was protective against GDM, while working women showed paradoxically higher prevalence despite superior awareness. These findings emphasize the dual need for targeted awareness campaigns among less educated women and workplace-based maternal health interventions to reduce occupational risks.

CONCLUSION

This study demonstrated that the prevalence of gestational diabetes mellitus in Faisalabad was 23.5%, with clear associations between awareness, education, and occupational status. Women with higher levels of education showed markedly lower prevalence and better understanding of GDM, underscoring the protective role of health literacy. Although working women exhibited greater awareness compared to housewives, they paradoxically demonstrated higher prevalence of GDM, suggesting that occupational and lifestyle-related stressors may offset the benefits of improved knowledge. These findings highlight the importance of integrating targeted educational interventions into antenatal care, with a dual focus on empowering less educated women through structured health education and addressing occupational health risks for employed women. By prioritizing awareness, screening, and prevention strategies, maternal and neonatal outcomes can be significantly improved, reducing the long-term burden of diabetes in this high-risk population.

REFERENCES

1. Shriraam V, Mahadevan S. Awareness of gestational diabetes mellitus among antenatal women in a primary health center in South India. Indian J Endocrinol Metab. 2013;17(1):146-8.

2. Dissassa HD, Tufa DG. Knowledge on gestational diabetes mellitus and associated factors among pregnant women attending antenatal care clinics of North Shewa zone public hospitals Oromia region Central Ethiopia. BMJ Open. 2023;13(7):e073339.

3. Parsons J, Sparrow K, Ismail K, Hunt K, Rogers H, Forbes A. Experiences of gestational diabetes and gestational diabetes care: a focus group and interview study. BMC Pregnancy Childbirth. 2018;18(1):25.

4. Perkins JM, Dunn JP, Jagasia SM. Perspectives in gestational diabetes mellitus: a review of screening, diagnosis and treatment. Clin Diabetes. 2007;25(2):57-62.

5. Thomas S, Pienyu R, Rajan SK. Awareness and knowledge about gestational diabetes mellitus among antenatal women. Psychol Community Health. 2019;8(1):237-48.

6. Bhowmik B, Afsana F. Evaluation of knowledge regarding gestational diabetes mellitus: a Bangladeshi study. Public Health. 2018;161:67-74.

7. Islam B, Islam F, Nyeem MAB. Knowledge and attitude regarding gestational diabetes mellitus among obese pregnant women. Int J Chem Stud. 2017;5(5):179-89.

8. El-Aaty HR, Hosein YE, Sharkawy SA, Amin NM. Women awareness and satisfaction toward health services provided at family health centers. Minia Sci Nurs J. 2019;6(1):158-66.

9. Kalra P, Kachhwaha CP, Singh HV. Prevalence of gestational diabetes mellitus and its outcome in western Rajasthan. Indian J Endocrinol Metab. 2013;17(4):677-80.

10. Ashraf S, Afzal M. Effects of health education guidelines on self-care knowledge among women with gestational diabetes mellitus. Ann Punjab Med Coll. 2023;17(1):45-9.

11. University of Faisalabad. Department of Rehabilitation Sciences. Prevalence of gestational diabetes in jobholding and housewives women associated with limited awareness of healthcare in Faisalabad [Doctor of Physiotherapy Thesis]. Faisalabad: The University of Faisalabad; 2023.

12. Erem C, Kuzu UB. Prevalence of gestational diabetes mellitus and associated risk factors in Turkish women: the Trabzon GDM Study. Arch Med Sci. 2015;11(4):724-35.

13. Fatereh MJ, Dolatian M, Mahmood Z. Comparative study on dietary style and physical activity of women with and without gestational diabetes. Acta Med Iran. 2016;54(10):637-44.

14. Elamurugan S, Arounassalame B. What do mothers know about gestational diabetes: knowledge and awareness. Indian J Obstet Gynecol Res. 2016;4:393-6.

15. McIntyre HD, Desoye G, Damm P, Mathiesen ER. Gestational diabetes mellitus. Nat Rev Dis Primers. 2019;5:47.

16. Raosoft. Sample size calculator [Internet]. Seattle: Raosoft Inc.; 2004 [cited 2025 Aug 22]. Available from: http://www.raosoft.com/samplesize.html

17. World Medical Association. Declaration of Helsinki – ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191-4.

18. Mdoe MB, Kibusi SM, Munyogwa MJ, Ernest AI. Prevalence and predictors of gestational diabetes mellitus among pregnant women attending antenatal clinic in Dodoma region, Tanzania: an analytical cross-sectional study. BMJ Nutr Prev Health. 2021;4(1):69-79.

19. Egbe TO, Tsaku ES. Prevalence and risk factors of gestational diabetes mellitus in a population of pregnant women attending three health facilities in Limbe, Cameroon: a cross-sectional study. Pan Afr Med J. 2018;31:195.

20. Monod C, Kotzaeridi G, Linder T, Eppel D. Prevalence of gestational diabetes mellitus in women with a family history of type 2 diabetes in first- and second-degree relatives. Acta Diabetol. 2022;60:345-51.

21. Nazarpour S, Simbar M, Kiani Z. Relationship between quality of life and some mental problems in women with gestational diabetes mellitus. BMC Psychiatry. 2024;24:511.

22. Holme LG, Henriksen L, Bjerkan K. Factors associated with the level of physical activity in a multi-ethnic pregnant population: a cross-sectional study at the time of diagnosis with gestational diabetes. BMC Pregnancy Childbirth. 2022;22:2-8.

23. Uzair M, Arshad Z, Sehar T. Prevalence of gestational diabetes among pregnant women. Int J Healthc Prof. 2025;2(1):40-4.

24. Gao C, Sun X, Lilu. Prevalence of gestational diabetes mellitus in mainland China: a systematic review and meta-analysis. J Diabetes Investig. 2019;10(1):154-62.

25. Alnaim A. Knowledge of gestational diabetes mellitus among prenatal women attending a public health center in Al-Khobar, Saudi Arabia. Egypt J Hosp Med. 2020;80:560-9.

26. Mukuve A, Noorani M, Sendagire I, Mgonja M. Magnitude of screening for gestational diabetes mellitus in an urban setting in Tanzania: a cross-sectional analytic study. BMC Pregnancy Childbirth. 2020;20:418.

27. Champion ML, Battarbee AN. Postpartum glucose intolerance following early gestational diabetes mellitus. Am J Obstet Gynecol MFM. 2022;4(3):100611.