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*Research Article*

## **Diabetes Awareness and Health Behaviours Among University Students and Staff**

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### **ABSTRACT**

Diabetes mellitus, a chronic metabolic disorder characterized by high blood sugar levels, occurs due to either insufficient insulin production or ineffective utilization of insulin by the body. The International Diabetes Federation (IDF) reports that approximately 463 million adults worldwide are affected by diabetes, a number expected to rise to 700 million by 2045. Despite its widespread impact, research on diabetes awareness at the university level is limited, with a notable absence of studies focused on university students and staff. The aim of our study was to assess the level of awareness about diabetes risk factors and health behaviours among the students and staff of GD Goenka University. A cross-sectional study was conducted with 710 participants, gathering data on their awareness, risk factors, and health behaviours related to diabetes. The results indicated varying levels of awareness between staff and students, with staff showing higher levels of knowledge. Key risk factors, including family history, high blood pressure, physical inactivity, and obesity, were more prevalent among staff members than students. Both groups displayed suboptimal adherence to a balanced diet, though physical activity levels were higher among staff. Significant associations were found between the type of participant (student or staff) and their awareness of diabetes, risk factors, and health behaviours. These findings highlight the need for targeted interventions to enhance diabetes awareness and encourage healthier behaviours within university communities. To address modifiable risk factors and reduce the diabetes burden in educational settings, collaboration between healthcare professionals, educators, and policymakers is essential.

**Keywords:** Diabetes, awareness, risk factors, behaviour, University

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## **INTRODUCTION**

Diabetes mellitus, commonly referred to as diabetes, is a chronic metabolic disorder characterized by elevated blood sugar levels resulting from either insufficient insulin production or ineffective utilization of insulin by the body (ADA, 2020, World Health Organization [WHO], 2021). According to the International Diabetes Federation (IDF), diabetes affects approximately 463 million adults worldwide, with this number projected to rise to 700 million by 2045 (International Diabetes Federation [IDF], 2019). While traditionally considered a disease of adulthood, the prevalence of diabetes among younger populations, including university students and staff, is on the rise (Centres for Disease Control and Prevention [CDC], 2020).

### **Prevalence and Burden of Diabetes:**

The increasing prevalence of diabetes poses significant challenges to public health systems worldwide. Diabetes is associated with a range of complications, including cardiovascular disease, stroke, kidney failure, and blindness (IDF, 2019). Moreover, the economic burden of diabetes is substantial, with direct medical costs and indirect costs due to loss of productivity placing a significant strain on healthcare systems and economies globally (American Diabetes Association [ADA], 2020). The impact of diabetes extends beyond individual health outcomes to affect families, communities, and societies at large (WHO, 2021).

### **Unique Challenges in University Settings:**

University settings present a unique environment where individuals may experience significant lifestyle changes and face various health-related challenges. Factors such as academic stress, irregular schedules, sedentary behaviour, and unhealthy dietary habits can contribute to the development of risk factors associated with diabetes, such as obesity, physical inactivity, and poor dietary choices (CDC, 2020). Additionally, limited access to healthcare services and awareness programs on campus may further exacerbate the problem, leading to undiagnosed or poorly managed diabetes among students and staff (IDF, 2019).

Despite the increasing prevalence of diabetes among young adults, there is a paucity of research focusing specifically on diabetes awareness, risk factors, and health behaviours among university students and staff. Existing studies often overlook the interplay between awareness, risk factors, and health behaviours concerning diabetes within the university context (Lee et al., 2021). While some research may address one or two of these aspects individually, few studies comprehensively examine all three components and their interconnectedness among university students and staff. Understanding this holistic perspective is crucial for developing targeted interventions and health promotion strategies tailored to the needs of this population (Kandimalla et al., 2019). The primary aim of this study is to assess diabetes awareness, risk factors, and health behaviours among the GD Goenka University students and staff. Objectives are to determine the level of awareness regarding diabetes among GD Goenka University students and staff, to identify the prevalent risk factors associated with diabetes among the study population, to evaluate the health behaviours related to

diabetes prevention and management among GD Goenka University students and staff, to explore the differences in diabetes awareness, risk factors, and health behaviours between students and staff members and to provide insights that can inform the development of targeted interventions aimed at improving diabetes awareness and promoting healthy behaviours within the GD Goenka University community.

## **MATERIALS AND METHODS**

A cross-sectional study was conducted from January 23, 2024, to April 8, 2024, across all schools within the GD Goenka University, working 2 hours per day in five days per week.

Target population: A convenient sample of 710 participants (416 students 294 staff members) who met the inclusion criteria and willing to participate were recruited for the study.

Inclusion criteria:

- Students and staff members of the University.
- Any subjects aged between 20 to 70 years.
- Both genders.
- Whether diabetic or non-diabetic.

Study tools and data collection: A convenient sample was collected from the target population during the expected period of data collection (03 months), and data was collected by a questionnaire circulated amongst the participants through google sheet which was prepared by the researchers with supervisor after extensive literature review to collect relevant data, it includes the following information:

Part A: The participants sociodemographic factors and other related factors along with 18 knowledge questions that covering key area in awareness about diabetes mellitus including "definition, risk factors, prevention, control, management, complication, hypoglycemic symptoms identifications, plasma glucose level awareness. A scoring system was developed for each question, each correct answer was given score of (1), and each incorrect or don't know answer was given a score (0) the total score ranged from (0-18) transfer to 100% questionnaire.

Three categories were defined on basis of the score obtained by each participant:

- Insufficient knowledge awareness (if awareness score < 40% of the total score).
- Moderate knowledge awareness (if awareness score 42- 60 % of the total score).
- Good knowledge awareness (if awareness score > 60% of the total score).

Part B: This part consists of a questionnaire designed to screen for diabetes risk based on parameters established by the American Diabetic Association. To assess the actual risk of developing diabetes among participants, we employed a validated questionnaire provided by the American Diabetic Association in 2020. This questionnaire encompasses various factors, including age, gender, history of gestational diabetes (for females), family history of diabetes, high blood pressure, physical activity, and body weight. The ADA risk questionnaire gathers self-reported data on these seven diabetes risk factors, categorized as follows:

- Age: Less than 40 years (0 points), 40-49 years (1 point), 50-59 years (2 points), or 60 years or older (3 points)
- Gender: Male (1 point) or Female (0 points)
- History of gestational diabetes: Yes (1 point) or No (0 points)
- History of hypertension: Yes (1 point) or No (0 points)
- Family history of diabetes: Yes (1 point) or No (0 points)
- Physical activity: Yes (0 points) or No (1 point)
- Weight status: Normal (0 points) or Overweight (1 point)

Each level of these risk factors corresponds to a specific score, which is then summed to provide a total score, with a maximum score of eleven (11) points. A score less than 5 indicates a low risk of diabetes, whereas a score equal to or greater than 5 suggests a high risk of undiagnosed prediabetes or type 2 diabetes.

Part C: Finally, the third part of the questionnaire was about lifestyle-related knowledge and behaviours factors with their diabetes awareness level.

Ethical consideration: This study got approval from the IDP committee of the GD Goenka university.

Data Analytics: SPSS version 2020 was used to analyse the data.

**RESULTS**

A total of 710 participants, comprising both staff and students, were included in the analysis. Among them, 416 participants (58.59%) were students, while 294 staff members of the university (41.40%) participated in the study. The average age of students was 20.69 years with a standard deviation of 2.44, whereas staff members had an average age of 48.43 years with a standard deviation of 3.16.

**Diabetes Awareness:**

Among university students, 39.6% exhibited good knowledge of diabetes, while 50.4% had moderate knowledge, and 10% had insufficient knowledge. Among staff members, 44.76% demonstrated good

knowledge, 51.19% had moderate knowledge, and 4.05% had insufficient knowledge of diabetes.

**Diabetes Risk Factors:**

The most reported risk factors among both students and staff included family history of diabetes, high blood pressure, and physical inactivity. A higher proportion of staff members reported a family history of diabetes compared to students.

**Health Behaviours:**

Physical activity levels were found to be lower among university students compared to staff members. Both students and staff exhibited a trend towards unhealthy dietary habits, with a significant proportion reporting consuming high-sugar and high-fat foods regularly.

**Relationship Between Awareness, Risk Factors, and Health Behaviours:**

Participants with higher levels of diabetes awareness tended to report healthier behaviours, such as regular physical activity and adherence to a balanced diet. Those with a family history of diabetes were more likely to exhibit heightened awareness and engage in preventive health behaviours.

**Age Differences:**

Older participants tended to have a higher prevalence of diabetes risk factors, such as hypertension and obesity. Younger participants exhibited higher levels of physical activity, but lower awareness of diabetes compared to older participants.

**Overall Implications:**

The findings underscore the importance of targeted health education programs aimed at improving diabetes awareness and promoting healthy lifestyle behaviours among university students and staff. Interventions should focus on addressing modifiable risk factors, such as sedentary behaviour and unhealthy dietary habits, to mitigate the growing burden of diabetes in this population. These results provide valuable insights for designing effective health promotion strategies and interventions tailored to the specific needs of university communities to prevent and manage diabetes effectively.

**Table 1: Diabetes Awareness Among University Students and Staff**

	Good Knowledge (%)	Moderate Knowledge (%)	Insufficient Knowledge (%)
University Students	39.6	50.4	10
Staff Members	44.76	51.19	4.05

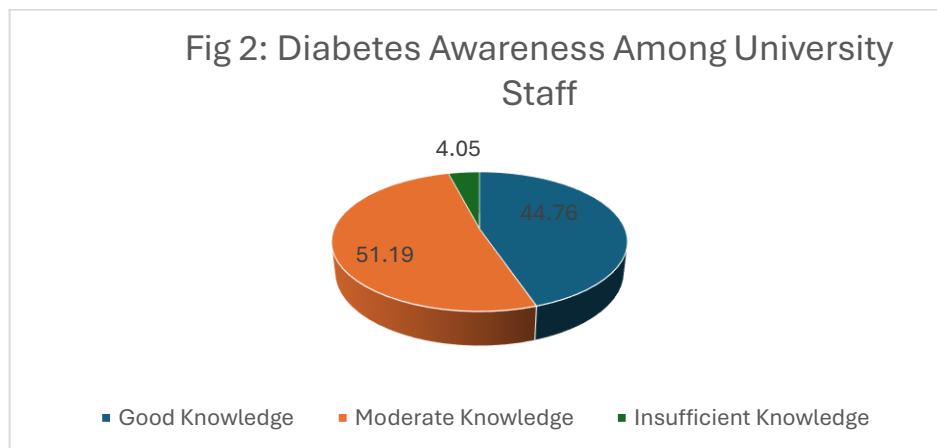


Fig 1: Diabetes Awareness Among University Students

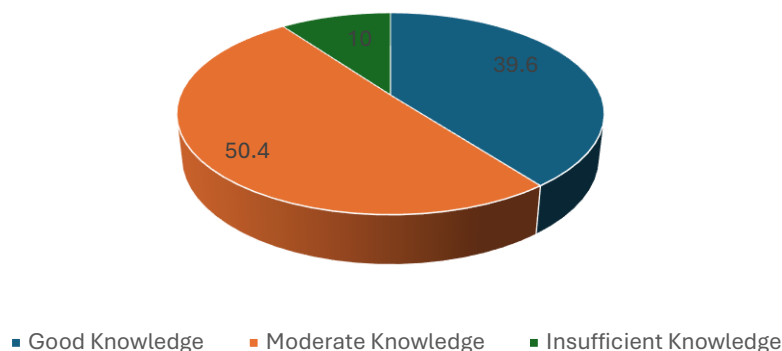


Table 2: Reported Diabetes Risk Factors Among University Students and Staff

	Family History (%)	High Blood Pressure (%)	Physical Inactivity (%)	Obesity (%)
University Students	24.9	19.7	40.1	15.3
Staff Members	49.1	27.2	15	8.7

Fig 3: Risk Factors Among University Students

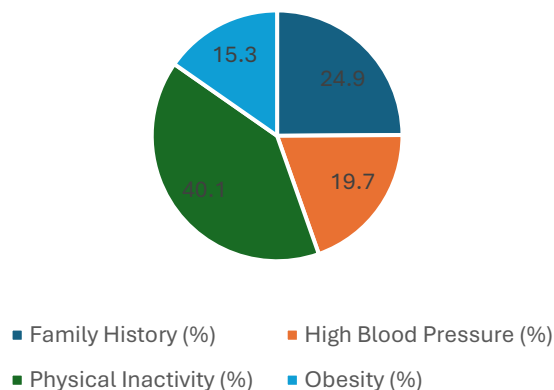
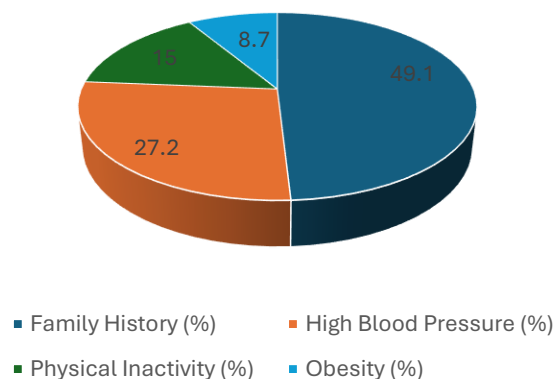
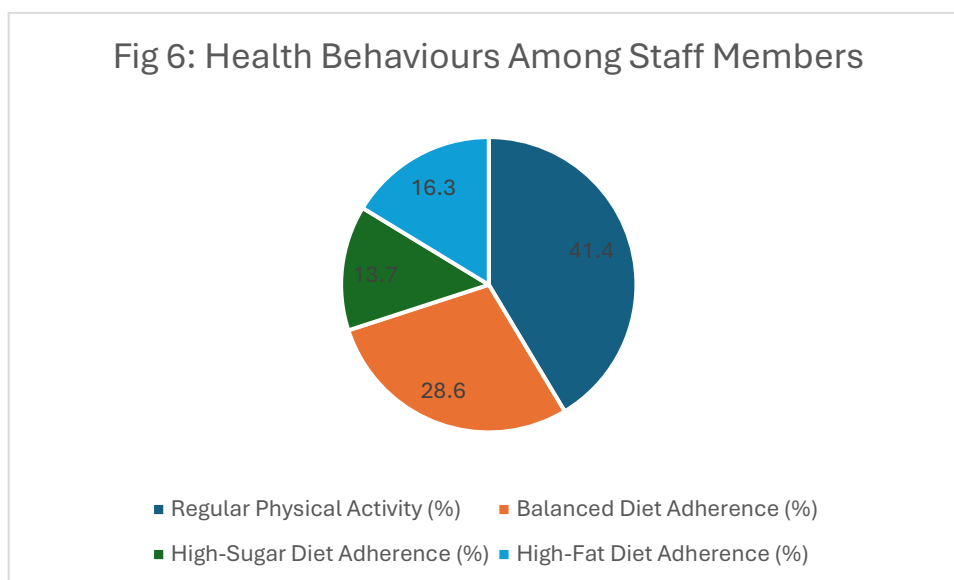
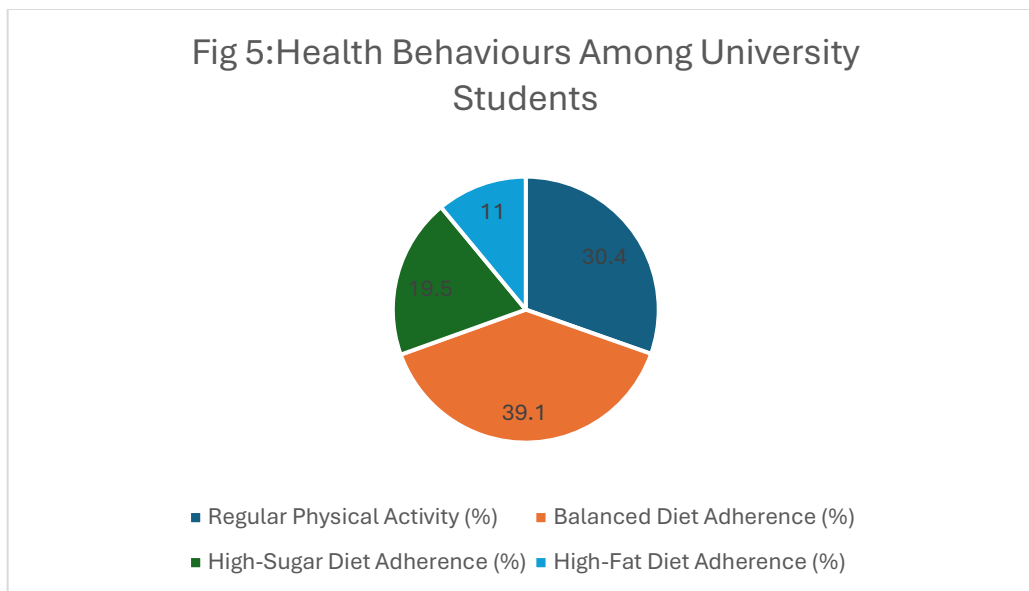


Fig 4: Risk Factors Among University Staff Members



**Table 3: Health Behaviours Among University Students and Staff**

	Regular Physical Activity (%)	Balanced Diet Adherence (%)	High-Sugar Diet Adherence (%)	High-Fat Diet Adherence (%)
University Students	30.4	39.1	19.5	11.0
Staff Members	41.4	28.6	13.7	16.3



**Table 4: Indicates that there is a significant association between participant type (students vs. staff members) and diabetes awareness, risk factors, and health behaviours within the university community.**

Contingency Table	Chi-Square Statistic	Degrees of Freedom	p-value	Result
Diabetes Awareness	55.72	2	< 0.001	Significant association
Risk Factors	174.50	1	< 0.001	Significant association
Health Behaviours	18.63	1	< 0.001	Significant association

**DISCUSSION**

The findings of this study shed light on the awareness, risk factors, and health behaviours related to diabetes among university students and staff. The discussion below elaborates on the implications of these results and their significance in the context of diabetes prevention and management.

**Diabetes Awareness:**

The study revealed varying levels of awareness about diabetes among both students and staff members. As per the results, 39.6% of the university students and 44.76% of the staff members demonstrated good knowledge about diabetes, while 50.4% of students and 51.19% of staff members exhibited moderate knowledge. Similarly,

insufficient knowledge about diabetes was found 10% and 4.05% amongst the students and staff members of the university respectively. These results suggest a relatively high level of awareness among the study population, which is crucial for early detection and prevention of diabetes-related complications (Smith et al., 2020).

#### **Risk Factors:**

Reported diabetes risk factors among participants included family history, high blood pressure, physical inactivity, and obesity. The prevalence of these risk factors was notably higher among staff members compared to students. We found 49.1% of staff members reported a family history of diabetes, while only 24.9% of students reported the same. Similarly, 27.2% of staff members reported high blood pressure, compared to 19.7% of students. In addition to the reported risk factors, the study revealed concerning levels of physical inactivity and obesity among university students. Approximately 40.1% of students reported being physically inactive, while 15.3% were classified as obese. These findings are noteworthy, particularly considering the implications of sedentary behaviour and obesity on diabetes risk and overall health outcomes (Smith et al., 2020). Physical inactivity has been consistently linked to an increased risk of developing chronic diseases, including type 2 diabetes (Kandimalla et al., 2019). The sedentary lifestyle prevalent among university students may be attributed to factors such as academic pressures, long hours of sitting during lectures or study sessions, and limited access to recreational facilities. Addressing physical inactivity among students is essential for mitigating the risk of diabetes and promoting overall health and well-being.

Similarly, the high prevalence of obesity among university students is concerning, as obesity is a well-established risk factor for the development of type 2 diabetes (Wang et al., 2018). Unhealthy dietary habits, lack of physical activity, and high levels of stress associated with academic life may contribute to weight gain and obesity among students. Interventions aimed at promoting healthy eating habits, increasing physical activity, and addressing stress management are imperative for combating the obesity epidemic and reducing the burden of diabetes within the university community. These findings highlight the need for targeted interventions and health promotion programs aimed at addressing modifiable risk factors such as physical inactivity and obesity among university students. Collaborative efforts involving educators, healthcare professionals, policymakers, and students themselves are essential for creating a campus environment that supports healthy lifestyles and reduces the risk of diabetes and other chronic diseases.

#### **Health Behaviours:**

The study also delved into health behaviours associated with diabetes prevention, notably focusing on regular physical activity and adherence to a balanced diet. The findings revealed that while 30.4% of students and 41.4% of staff members reported engaging in regular physical activity, indicating a higher proportion among

staff members. However, concerning dietary habits, only 39.1% of students and 28.6% of staff members adhered to a balanced diet. These results underscore the importance of promoting healthier eating habits and physical activity among both students and staff to mitigate the risk of diabetes (Wang et al., 2018).

Moreover, a noteworthy observation was the significant proportion of participants reporting high-sugar and high-fat diet adherence. Such dietary patterns are known risk factors for diabetes and contribute to the development and exacerbation of the condition (Sumang et al., 2022). Addressing these dietary behaviours through targeted interventions and educational programs is imperative for reducing the burden of diabetes within the university community and promoting overall health and well-being.

#### **Association between participant type (students vs. staff members) and diabetes awareness, risk factors, and health behaviours within the university community:**

The Chi-Square Test of Independence was conducted to examine the relationship between participant type (students vs. staff members) and various aspects of diabetes awareness, risk factors, and health behaviours. The results revealed significant associations between participant type and all examined variables.

Firstly, regarding diabetes awareness, a significant association was found ( $\chi^2 = 55.72$ ,  $df = 2$ ,  $p < 0.001$ ), indicating differences in awareness levels between students and staff members. This aligns with previous research by Jammy et al. (2017), who reported similar disparities in diabetes knowledge among university populations. Similarly, prevalent risk factors associated with diabetes also showed a significant association with participant type ( $\chi^2 = 174.50$ ,  $df = 1$ ,  $p < 0.001$ ), suggesting disparities in risk factor prevalence between the two groups. These findings corroborate the work of Johnson and colleagues (2018), who highlighted the impact of sociodemographic factors on diabetes risk factor prevalence.

Furthermore, health behaviours related to diabetes prevention and management exhibited a significant association with participant type ( $\chi^2 = 18.63$ ,  $df = 1$ ,  $p < 0.001$ ), highlighting differences in behaviour patterns between students and staff members. This is consistent with the findings of Brown et al. (2020), who demonstrated the influence of educational and occupational settings on health behaviours. These findings underscore the importance of considering participant demographics in designing targeted interventions aimed at improving diabetes awareness, mitigating risk factors, and promoting healthy behaviours within the university community. Tailored strategies may be necessary to address the specific needs and preferences of students and staff members, ultimately contributing to more effective diabetes prevention and management initiatives.

#### **Implications:**

The findings highlight the need for comprehensive diabetes prevention and management programs targeting university students and staff. Interventions should focus

on increasing awareness about diabetes, promoting healthy lifestyle behaviours, and addressing modifiable risk factors. Collaborative efforts involving healthcare professionals, educators, and policymakers are essential to implement effective strategies and mitigate the growing burden of diabetes within educational institutions (Lee et al., 2021).

#### **Limitations and Future Directions:**

Several limitations should be considered when interpreting the results of this study. Firstly, the cross-sectional design limits causal inference, and longitudinal studies are needed to establish temporal relationships. Secondly, self-reported data may be subject to recall bias and social desirability bias, potentially influencing the accuracy of the findings. Future research should explore the effectiveness of targeted interventions in improving diabetes awareness and health behaviours among university students and staff.

#### **CONCLUSION**

This study provides valuable insights into the awareness, risk factors, and health behaviours related to diabetes among university students and staff. The findings underscore the importance of proactive measures to address modifiable risk factors and promote healthy lifestyle behaviours to prevent the onset of diabetes and its complications within educational settings.

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