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Prevalence And Risk Factors Of Type 1 And Type 2 Diabetes. "A Comparative Study"

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Abstract

Background: Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia due to defects in insulin secretion, insulin action, or both. It is broadly classified into Type 1 and Type 2 diabetes, which differ in etiology, risk factors, and clinical characteristics. The global burden of diabetes is rapidly increasing, making it a major public health concern.

Objective: The present study aimed to assess the prevalence and risk factors of Type 1 and Type 2 diabetes mellitus and to conduct a comparative analysis of both types among diabetic patients in a community setting.

Methods: A cross-sectional descriptive study was conducted in the community of Hayatabad. Data were collected from 75 diabetic patients through household visits using a structured questionnaire. Convenience sampling was used for participant selection. Data were analyzed using SPSS, and results were presented in frequencies and percentages.

Results: Out of 75 participants, Type 2 diabetes was more prevalent (84.0%) compared to Type 1 diabetes (16.0%). Most patients were aged 56–70 years (34.7%) and were predominantly female (57.3%). A significant proportion of participants were housewives (50.7%) and physically inactive (62.7%). Other major risk factors included positive family history of diabetes (60.0%), overweight/obesity (50.6%), hypertension (68.0%), and high stress levels (70.0%). Most participants (77.3%) were on medication, and 57.3% monitored their blood glucose daily.

Conclusion: The study concludes that Type 2 diabetes is the dominant form of diabetes in the study population. Both modifiable (physical inactivity, obesity, diet, stress) and non-modifiable (age, family history) risk factors significantly contribute to the development of diabetes. Early screening, lifestyle modification, and health education are essential for prevention and control of diabetes mellitus.

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It is recognized as one of the fastest-growing global health challenges of the 21st century and has become a major cause of morbidity, mortality, and disability worldwide (World Health Organization [WHO], 2025). The disease affects individuals of all age groups and socioeconomic backgrounds, significantly reducing quality of life and increasing healthcare expenditures. Diabetes is broadly categorized into Type 1 Diabetes Mellitus (T1DM) and Type 2 Diabetes Mellitus (T2DM), each having distinct etiological, pathological, and clinical characteristics. Despite these differences, both forms of diabetes contribute substantially to the global burden of disease and are associated

with severe long-term complications affecting nearly every organ system of the body.

Type 1 diabetes mellitus is primarily an autoimmune disorder characterized by destruction of the insulin-producing beta cells of the pancreas, leading to absolute insulin deficiency (American Diabetes Association [ADA], 2025). It commonly develops during childhood and adolescence, although it may occur at any age. The exact cause of T1DM remains unclear; however, genetic susceptibility, autoimmune responses, viral infections, and environmental triggers are believed to play an important role in its development (Atkinson et al., 2014). Individuals with Type 1 diabetes require lifelong insulin therapy for survival because the pancreas produces little or no insulin. Without proper management, the disease may lead to serious acute complications such as diabetic ketoacidosis as well as long-term vascular and neurological complications.

In contrast, Type 2 diabetes mellitus is characterized mainly by insulin resistance combined with progressive impairment of insulin secretion. It accounts for approximately 90–95% of all diabetes cases globally and is considered a major public health problem in both developed and developing countries (International Diabetes Federation [IDF], 2025). Unlike T1DM, Type 2 diabetes is strongly associated with modifiable lifestyle-related risk factors such as obesity, physical inactivity, unhealthy dietary habits, smoking, stress, and sedentary behavior. Genetic predisposition, increasing age, hypertension, and family history also significantly contribute to disease development (Hu, 2011). In recent years, the prevalence of Type 2 diabetes has increased rapidly among younger age groups due to urbanization, technological advancement, and lifestyle transitions.

The global prevalence of diabetes has risen dramatically over the past few decades. According to the International Diabetes Federation, hundreds of millions of adults are currently living with diabetes worldwide, and this number is projected to increase substantially by 2050 if effective preventive measures are not implemented (IDF, 2025). Developing countries are experiencing the greatest increase due to rapid urbanization, changing dietary patterns, reduced physical activity, and economic transitions. The World Health Organization has also identified diabetes as a leading cause of blindness, kidney failure, heart attacks, stroke, and lower-limb amputations (WHO, 2025). The increasing prevalence of diabetes imposes a heavy economic burden on healthcare systems and negatively affects productivity and social wellbeing.

Diabetes mellitus is associated with numerous acute and chronic complications that significantly impair patients' quality of life. Chronic hyperglycemia can damage blood vessels and nerves, resulting in microvascular complications such as diabetic retinopathy, nephropathy, and

neuropathy, as well as macrovascular complications including coronary artery disease, cerebrovascular disease, and peripheral vascular disease (Forouhi & Wareham, 2019). These complications contribute to increased hospitalization, disability, and premature mortality among diabetic patients. Furthermore, poorly controlled diabetes can weaken the immune system, increasing susceptibility to infections and delayed wound healing.

Several risk factors have been identified for the development of both Type 1 and Type 2 diabetes. Genetic predisposition is considered an important non-modifiable risk factor in both conditions. Environmental and autoimmune mechanisms are more strongly linked with Type 1 diabetes, whereas obesity and lifestyle-related behaviors play a dominant role in Type 2 diabetes (Skyler et al., 2017). Increased body mass index (BMI), unhealthy eating habits, lack of physical exercise, and psychological stress have been consistently associated with higher rates of Type 2 diabetes. Understanding these risk factors is essential for early diagnosis, prevention, and effective disease management.

Comparative studies between Type 1 and Type 2 diabetes are important because they provide insight into the similarities and differences in prevalence, etiology, clinical manifestations, and associated risk factors. Such studies help healthcare professionals identify vulnerable populations and implement targeted interventions for disease prevention and management. Additionally, comparing the two forms of diabetes can improve awareness regarding early symptoms, preventive measures, and the importance of healthy lifestyle modifications. Public health education and screening programs are essential in reducing the burden of diabetes and preventing long-term complications.

The increasing burden of diabetes worldwide emphasizes the need for comprehensive research to evaluate its prevalence and associated risk factors in different populations. Epidemiological studies play a crucial role in identifying trends and determinants of diabetes, thereby supporting healthcare planning and policy development. Early detection and intervention can significantly reduce complications, improve patient outcomes, and decrease healthcare costs associated with diabetes management.

Therefore, the present study entitled “Prevalence and Risk Factors of Type 1 and Type 2 Diabetes: A Comparative Study” aims to assess and compare the prevalence and associated risk factors of both types of diabetes among the study population. The findings of this study may contribute to a better understanding of the epidemiological patterns of diabetes and assist clinicians, researchers, and public health authorities in developing effective preventive and therapeutic strategies to combat this growing global health problem.

Methodology:

The present study was designed as a cross-sectional descriptive study to assess the prevalence and risk factors associated with Type 1 and Type 2 diabetes mellitus among the study population. A cross-sectional study design was considered appropriate because it allows the researcher to collect data from participants at a single point in time and evaluate the distribution of disease and associated risk factors within the community. The study was conducted in the community setting of Hayatabad through household visits. Data were collected randomly from participants residing in different areas of the community. The purpose of selecting a community-based setting was to obtain information directly from diabetic individuals living in the general population and to identify common demographic and lifestyle-related risk factors associated with diabetes mellitus.

Data collection was carried out using a structured questionnaire. Participants were approached during household visits, and informed consent was obtained prior to data collection. The questionnaire included information regarding demographic characteristics, type of diabetes, family history, dietary habits, physical activity, obesity, smoking status, and other relevant risk factors. Participants were interviewed individually to ensure accurate and complete responses. A convenience sampling technique was used for participant selection. Individuals who were available and willing to participate during the study period were included in the research. This sampling method was selected because it was practical, time-efficient, and suitable for community-based data collection within the available resources and timeframe.

The calculated sample size was approximately 75 participants.

The study included individuals diagnosed with diabetes mellitus, including both Type 1 and Type 2 diabetes patients. Only those participants who were willing to participate and fulfilled the study criteria were enrolled in the research. Individuals without diabetes mellitus were excluded from the study. After completion of data collection, all collected information was entered and analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequencies, percentages, tables, and graphs were used to summarize the findings. The analyzed data were then interpreted to identify the prevalence and major risk factors associated with Type 1 and Type 2 diabetes mellitus among the study population.

Results

A total of 75 diabetic patients were included in the study. Most participants belonged to the older age group, with the highest proportion (34.7%) in 56–70 years, followed by 41–55 years (29.3%). Females (57.3%) were more common than males (42.7%). More than half of the participants were housewives (50.7%), while the rest were employed, teachers, drivers, and students. Regarding disease duration, most patients had diabetes for 1–5

years (42.7%), followed by 6–10 years (30.7%). Only a small proportion had long-standing diabetes of more than 15 years. Lifestyle assessment showed that physical inactivity was common (62.7%). About 41.3% of patients consumed sugary foods regularly, while the rest consumed them rarely or never. Most participants were non-smokers (78.7%) and reported early sleeping habits (78.7%). In terms of clinical profile, Type 2 diabetes was predominant (84.0%) compared to Type 1 (16.0%). Family history was present in 60% of patients. Most patients were on medication (77.3%), and more than half monitored blood glucose daily (57.3%). Regarding BMI, 50.6% were overweight or obese. Hypertension was the most common comorbidity (68.0%), followed by high cholesterol (37.3%) and heart disease (38.7%). Nearly 70% of patients reported moderate to very high stress levels.

Table 1: Demographic Characteristics of Patients

Variable	Category	Frequency	Percentage
Age	26–40 years	19	25.3%
	41–55 years	22	29.3%
	56–70 years	26	34.7%
	71–85 years	8	10.7%
Gender	Male	32	42.7%
	Female	43	57.3%
Occupation	Housewife	38	50.7%
	Teacher	12	16.0%
	Employed	17	22.7%
	Driver	4	5.3%
	Student	4	5.3%
Duration of Diabetes	1–5 years	32	42.7%
	6–10 years	23	30.7%
	11–15 years	15	20.0%
	16–20 years	4	5.3%
	⩾21 years	1	1.3%

Table 2: Lifestyle and Behavioral Factors

Variable	Category	Frequency	Percentage
Sugary food intake	Daily	15	20.0%
	Weekly	16	21.3%
	Rarely	20	26.7%

Variable	Category	Frequency	Percentage
	Never	24	32.0%
Physical activity	Yes	28	37.3%
	No	47	62.7%
Smoking	Yes	16	21.3%
	No	59	78.7%
Sleep pattern	Early sleeper	59	78.7%
	Not early sleeper	16	21.3%

Table 3: Clinical Profile of Patients

Variable	Category	Frequency	Percentage
Family history	Yes	45	60.0%
	No	30	40.0%
Blood sugar monitoring	Daily	43	57.3%
	Weekly	20	26.7%
	Rarely	11	14.7%
	Never	1	1.3%
Medication use	Yes	58	77.3%
	No	17	22.7%
Type of diabetes	Type 1	12	16.0%
	Type 2	63	84.0%
BMI	Underweight	7	9.3%
	Normal	30	40.0%
	Overweight	25	33.3%
	Obese	13	17.3%

Table 4: Risk Factors and Co-morbidities

Variable	Category	Frequency	Percentage
Hypertension	Yes	51	68.0%
	No	24	32.0%
Cholesterol	Yes	28	37.3%

Variable	Category	Frequency	Percentage
	No	47	62.7%
Co-morbidity	Yes	37	49.3%
	No	38	50.7%
Heart disease	Yes	29	38.7%
	No	46	61.3%
Stress level	Very low	5	6.7%
	Low	17	22.7%
	Moderate	16	21.3%
	High	16	21.3%
	Very high	21	28.0%

Discussion

The present study aimed to assess the prevalence and risk factors of Type 1 and Type 2 diabetes mellitus among 75 diabetic patients in a community-based setting. The findings revealed that Type 2 diabetes was significantly more prevalent (84.0%) compared to Type 1 diabetes (16.0%), which is consistent with global epidemiological trends reported by the International Diabetes Federation (IDF, 2025), where Type 2 diabetes accounts for the majority of cases worldwide. In the current study, most participants belonged to the older age groups, particularly 56–70 years (34.7%), indicating that diabetes is more common in middle-aged and elderly populations. This finding aligns with previous research showing that increasing age is a major non-modifiable risk factor for Type 2 diabetes due to reduced insulin sensitivity and metabolic changes.

Gender distribution showed a higher prevalence in females (57.3%) compared to males (42.7%). This may be associated with higher rates of physical inactivity and obesity among female participants in this population. Similar findings have been reported in regional studies where female predominance is linked to lifestyle patterns and hormonal factors. Regarding occupational status, housewives constituted the largest group (50.7%), suggesting that reduced physical activity and sedentary lifestyle may contribute to increased diabetes risk. A significant proportion of participants were also physically inactive (62.7%), which strongly supports the role of sedentary behavior in diabetes development, particularly Type 2 diabetes.

Lifestyle risk factors were highly evident in this study. A notable proportion of participants consumed sugary foods regularly (41.3%), and more than one-third were overweight or obese (50.6% combined). Obesity is a well-established risk factor for insulin resistance and Type 2 diabetes, supporting

findings from Hu (2011), who emphasized the strong association between obesity and diabetes risk.

Family history of diabetes was present in 60% of participants, indicating a strong genetic predisposition in the study population. This finding is consistent with existing literature that identifies heredity as an important non-modifiable risk factor for both Type 1 and Type 2 diabetes. Comorbid conditions were also highly prevalent, with hypertension (68.0%) and heart disease (38.7%) being common. These findings highlight the clustering of metabolic and cardiovascular risk factors in diabetic patients, increasing the risk of complications and mortality. Stress levels were also high among participants, with 70% reporting moderate to very high stress, which may further worsen glycemic control through hormonal imbalance and unhealthy lifestyle behaviors. Overall, the study demonstrates that Type 2 diabetes is more common in the community and is strongly associated with modifiable risk factors such as physical inactivity, obesity, dietary habits, and stress, along with non-modifiable factors such as age and family history.

Conclusion

The present study concludes that Type 2 diabetes mellitus is the predominant form of diabetes in the study population, while Type 1 diabetes is less common. The disease is more prevalent among older age groups and females. Major contributing factors identified include physical inactivity, unhealthy dietary habits, obesity, positive family history, and associated comorbid conditions such as hypertension and heart disease. The findings highlight that both modifiable and non-modifiable risk factors play a significant role in the development and progression of diabetes mellitus. Early identification of high-risk individuals and appropriate lifestyle modifications are essential to reduce the burden of diabetes and its complications in the community.

Recommendations

Based on the findings of the study, the following recommendations are made:

Community-based awareness programs should be conducted to educate people about risk factors and prevention of diabetes mellitus.

Regular screening for blood glucose levels should be encouraged, especially in high-risk individuals such as those with obesity and family history.

Lifestyle modification programs should be promoted, including increased physical activity, weight management, and healthy dietary habits.

Health education should focus on reducing consumption of sugary foods and improving nutritional awareness.

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