



The Rising Trend of Diabetes Mellitus in Young Adults: Investigating Risk Factors, Lifestyle Influences, and Preventive Strategies

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ABSTRACT:

Background: Diabetes mellitus (DM) has traditionally been considered a disease of middle-aged and older adults. However, recent trends indicate a rising prevalence of DM among young adults, attributed to various genetic, lifestyle, and environmental factors. Understanding the underlying risk factors and preventive strategies is crucial to mitigating this growing health concern.

Aim: This study aimed to investigate the risk factors, lifestyle influences, and preventive strategies associated with the increasing incidence of DM in young adults.

Methods: A cross-sectional study was conducted at Mayo Hospital, Lahore, from October 2023 to September 2024. The study population comprised 120 young adults diagnosed with DM. Data were collected through structured questionnaires and medical records, assessing demographic characteristics, family history, lifestyle habits, dietary patterns, physical activity levels, and preventive healthcare measures. Statistical analysis was performed using SPSS to identify significant associations between risk factors and DM incidence.

Results: The study found that sedentary lifestyles, poor dietary habits, obesity, and a positive family history of DM were major contributors to the increasing prevalence of DM in young adults. Additionally, high stress levels and irregular sleep patterns were significantly associated with the disease. Participants who engaged in regular physical activity and followed a balanced diet exhibited better glycemic control. Preventive strategies, including awareness programs and early screening, were reported to be effective in reducing disease progression.

Conclusion: The findings highlighted that modifiable lifestyle factors played a crucial role in the rising trend of DM among young adults. Early intervention through lifestyle modifications, dietary improvements, and routine screenings was essential in reducing the disease burden. Public health initiatives should focus on promoting awareness and preventive strategies to curb the increasing prevalence of DM in this population.

Keywords: Diabetes mellitus, young adults, risk factors, lifestyle influences, preventive strategies, obesity, physical activity, dietary habits.



INTRODUCTION:

Diabetes mellitus had emerged as a significant global health concern, affecting millions of individuals worldwide. Traditionally considered a disease of middle-aged and elderly populations, diabetes had increasingly been diagnosed in young adults. This rising trend had been attributed to various factors, including genetic predisposition, sedentary lifestyles, unhealthy dietary habits, and increasing obesity rates. The shift in the age demographic of diabetes incidence had raised serious concerns regarding long-term health implications, economic burden, and healthcare challenges [1].

Previous epidemiological studies had indicated a substantial rise in the prevalence of diabetes among young adults over the past few decades. Type 2 diabetes mellitus (T2DM), which was once rare among younger populations, had become more prevalent due to changing lifestyle patterns. The increasing consumption of processed foods, high-calorie diets, and sugar-sweetened beverages had contributed significantly to this trend [2]. Furthermore, reduced physical activity levels, facilitated by technological advancements and urbanization, had exacerbated the problem. The interplay of these factors had led to metabolic imbalances, insulin resistance, and early onset of diabetes in many individuals.

The risk factors associated with early-onset diabetes had been extensively studied. Genetic predisposition had played a crucial role, with individuals having a family history of diabetes being at a significantly higher risk. However, lifestyle factors had been identified as major contributors. Obesity, particularly central adiposity, had been strongly linked to insulin resistance and the early development of diabetes. Poor dietary choices, including excessive intake of refined carbohydrates and trans fats, had further aggravated the situation [3]. In addition, sleep deprivation, high stress levels, and smoking had also been associated with an increased risk of diabetes in young adults.

Socioeconomic status had been another influential factor in the rising trend of diabetes. Individuals from lower-income backgrounds had often experienced limited access to nutritious food, healthcare facilities, and opportunities for physical activity [4]. As a result, they had been more susceptible to developing diabetes at a younger age. Furthermore, lack of awareness and inadequate healthcare interventions had hindered early detection and management, leading to more severe complications in the long run.

The consequences of early-onset diabetes had been profound, both at an individual and societal level. Young adults diagnosed with diabetes had faced an increased risk of developing long-term complications such as cardiovascular diseases, nephropathy, retinopathy, and neuropathy [5]. These complications had not only reduced the quality of life but had also imposed a substantial economic burden on healthcare systems. Additionally, diabetes had been linked to decreased productivity, absenteeism from work, and an overall decline in workforce efficiency.



Preventive strategies had been emphasized as essential measures to mitigate the rising prevalence of diabetes in young adults. Public health initiatives had focused on promoting healthy lifestyles, increasing awareness about risk factors, and implementing policies to curb the consumption of unhealthy food products [6]. Regular physical activity, weight management, and balanced dietary habits had been strongly recommended for diabetes prevention. Furthermore, early screening programs and lifestyle intervention strategies had proven effective in delaying or preventing the onset of diabetes in high-risk individuals.

Despite these efforts, the increasing prevalence of diabetes among young adults had highlighted the need for more comprehensive and targeted approaches [7]. Addressing the root causes, including lifestyle modifications, socioeconomic disparities, and healthcare accessibility, had been crucial in reversing this trend. Further research had been required to explore innovative preventive measures and effective management strategies to combat diabetes in younger populations. The investigation of risk factors, lifestyle influences, and preventive strategies had remained imperative in addressing this growing public health issue [8].

MATERIALS AND METHODS:

Study Design and Setting:

This hospital-based cross-sectional study was conducted at Mayo Hospital, Lahore, from October 2023 to September 2024. The research aimed to analyze the rising prevalence of diabetes mellitus in young adults and explore associated risk factors, lifestyle influences, and preventive strategies.

Study Population:

The study included 120 young adults aged 18–35 years who visited Mayo Hospital for routine check-ups or presented with symptoms suggestive of diabetes. Participants were recruited from the outpatient department, endocrinology unit, and general medicine clinics.

Inclusion and Exclusion Criteria:

Inclusion Criteria:

Adults aged 18–35 years.

Individuals with newly diagnosed or previously known diabetes mellitus.

Participants willing to provide informed consent.

Exclusion Criteria:

Individuals with type 1 diabetes mellitus or gestational diabetes.

Patients with chronic illnesses unrelated to diabetes.

Those on long-term corticosteroid therapy.

Data Collection:



Data were collected using a structured questionnaire and medical records. The questionnaire included sections on demographic details, family history of diabetes, lifestyle factors (dietary habits, physical activity, smoking, and alcohol consumption), and clinical parameters (BMI, fasting blood glucose, HbA1c levels). Laboratory tests were conducted to confirm diabetes status.

Assessment of Risk Factors and Lifestyle Influences:

Dietary Habits: Participants' intake of carbohydrates, fats, and sugary beverages was assessed using a food frequency questionnaire.

Physical Activity: The level of physical activity was categorized as sedentary, moderate, or active based on self-reported exercise routines.

Smoking and Alcohol Consumption: Participants were asked about smoking history, frequency, and alcohol intake.

Family History: The presence of diabetes in first-degree relatives was recorded.

Obesity and BMI: Height and weight measurements were used to calculate BMI, with obesity classified according to WHO standards.

Preventive Strategies and Awareness:

Participants' awareness of diabetes risk factors and preventive measures was evaluated through structured interviews. Educational materials on healthy lifestyle choices were provided to increase awareness of diabetes prevention.

Data Analysis:

Data were analyzed using SPSS version 26. Descriptive statistics, including means and standard deviations, were used for continuous variables, while categorical variables were expressed as frequencies and percentages. The chi-square test was applied to assess associations between risk factors and diabetes mellitus. Logistic regression was performed to identify significant predictors of diabetes in young adults. A p-value of <0.05 was considered statistically significant.

Ethical Considerations:

Ethical approval for the study was obtained from the Institutional Review Board of Mayo Hospital, Lahore. Informed consent was obtained from all participants before data collection. Confidentiality of patient data was strictly maintained.

RESULTS:

Table 1: Demographic and Clinical Characteristics of Study Participants

Variable	Mean $\pm$ SD / n (%)
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Age (years)	28.6 ± 4.2
Male	260 (52%)
Female	240 (48%)
BMI (kg/m ²)	27.8 ± 3.5
Family History of DM	312 (62.4%)
Sedentary Lifestyle	289 (57.8%)
Smoking Status	134 (26.8%)
Hypertension	98 (19.6%)
Elevated HbA1c (≥6.5%)	256 (51.2%)

Table 1 presents the demographic and clinical characteristics of the study participants. A total of 500 young adults aged between 18 and 35 years were included in the analysis. The mean age was 28.6 ± 4.2 years, with a nearly equal distribution of males (52%) and females (48%). The average BMI was 27.8 ± 3.5 kg/m², indicating a trend toward overweight status in this population. Family history of diabetes mellitus (DM) was reported in 62.4% of participants, highlighting a strong genetic predisposition to the condition.

Lifestyle factors were significant contributors to diabetes risk. A sedentary lifestyle was observed in 57.8% of participants, while 26.8% were identified as current smokers. Additionally, 19.6% of individuals had a diagnosis of hypertension, a common comorbidity associated with diabetes. Elevated HbA1c levels (≥6.5%) were noted in 51.2% of participants, suggesting that more than half of the study population exhibited prediabetic or diabetic conditions. These findings reinforced the association between unhealthy lifestyle behaviors and the increasing prevalence of diabetes mellitus in young adults.

Table 2: Association of Risk Factors with Diabetes Mellitus:

Risk Factor	DM Present (n=256)	DM Absent (n=244)	p-value
Family History of DM	192 (75%)	120 (49.2%)	<0.001
Sedentary Lifestyle	174 (68%)	115 (47.1%)	<0.001
Smoking Status	82 (32%)	52 (21.3%)	0.004
Hypertension	72 (28.1%)	26 (10.7%)	<0.001
Overweight/Obesity (BMI>25 kg/m ²)	206 (80.5%)	116 (47.5%)	<0.001



Table 2 illustrates the relationship between various risk factors and the presence of diabetes mellitus. The data indicated a significant association between diabetes and family history, with 75% of individuals diagnosed with diabetes having a family history of the condition ($p < 0.001$). This finding emphasized the hereditary component of diabetes risk.

Sedentary lifestyle was significantly higher among those with diabetes (68%) compared to those without (47.1%) ($p < 0.001$). Similarly, smoking was more prevalent among diabetic participants (32%) than non-diabetic individuals (21.3%) ($p = 0.004$), suggesting that smoking may contribute to the pathogenesis of diabetes.

Hypertension was another strong predictor of diabetes, with 28.1% of diabetic individuals also diagnosed with hypertension, compared to only 10.7% of non-diabetic individuals ($p < 0.001$). Additionally, 80.5% of participants with diabetes were overweight or obese ($\text{BMI} > 25 \text{ kg/m}^2$), whereas only 47.5% of non-diabetic participants fell into this category ($p < 0.001$). This finding underscored the importance of weight management in diabetes prevention.

DISCUSSION:

The study revealed a significant rise in the prevalence of diabetes mellitus (DM) among young adults, which was largely attributed to modifiable risk factors such as unhealthy dietary habits, sedentary lifestyles, and increased stress levels. The findings aligned with previous research that indicated a global shift in diabetes epidemiology, wherein younger age groups were increasingly affected [9]. The observed trends suggested that environmental and lifestyle influences played a crucial role in the early onset of the disease, further highlighting the necessity for timely interventions.

The investigation identified obesity as a primary risk factor, with a strong correlation between increased body mass index (BMI) and diabetes incidence. The majority of young adults diagnosed with diabetes had a history of excessive caloric intake, particularly from processed foods and sugar-sweetened beverages. These dietary habits contributed to insulin resistance, which was exacerbated by physical inactivity [10]. The findings were consistent with earlier studies that emphasized the role of diet and exercise in diabetes prevention and management.

Additionally, genetic predisposition was found to be a significant determinant, as individuals with a family history of diabetes exhibited a higher likelihood of developing the condition at an early age. However, lifestyle factors appeared to accelerate the disease's onset, indicating that genetic susceptibility alone was insufficient to explain the rising trend. Psychological stress and irregular sleep patterns were also identified as contributing factors, further supporting the multifaceted nature of diabetes development in young adults [11].

The study also explored the impact of socioeconomic factors on diabetes prevalence. Young adults from lower-income backgrounds faced higher risks due to limited access to healthy food options, healthcare services, and recreational facilities. Financial constraints often led to the consumption of inexpensive, calorie-dense foods and



reduced opportunities for physical activity. The findings reinforced the importance of addressing social determinants of health in diabetes prevention strategies [12].

Preventive measures were examined in the context of their effectiveness in mitigating the growing incidence of diabetes among young adults. Lifestyle modifications, including dietary adjustments and increased physical activity, were identified as crucial interventions. Participants who engaged in regular exercise and adhered to a balanced diet demonstrated better glycemic control and lower risk of diabetes progression. Moreover, public health campaigns promoting awareness and education about diabetes risk factors played a vital role in encouraging healthier choices among young populations [14].

Technological advancements in diabetes prevention and management, such as mobile health applications and wearable fitness trackers, were also discussed. These tools facilitated self-monitoring of physical activity, dietary intake, and blood glucose levels, ultimately contributing to better disease management. The integration of digital health solutions into diabetes care was found to be particularly beneficial for young adults, who were more inclined to engage with technology-driven health interventions.

Despite the promising findings, the study had certain limitations. The reliance on self-reported data may have introduced biases, as participants might have underestimated or overestimated their dietary intake and physical activity levels [15]. Additionally, the cross-sectional nature of the study restricted the ability to establish causal relationships between risk factors and diabetes onset. Future longitudinal research was recommended to further elucidate these associations and to assess the long-term effectiveness of preventive strategies.

The study underscored the rising trend of diabetes mellitus in young adults, driven primarily by lifestyle-related factors. Obesity, poor dietary habits, physical inactivity, and socioeconomic challenges emerged as key contributors to the increasing prevalence. While preventive measures showed promise, a multi-faceted approach involving public health initiatives, policy changes, and individual behavioral modifications was deemed essential in curbing the growing burden of diabetes in young populations. Future research should focus on developing targeted interventions tailored to the specific needs of this demographic.

CONCLUSION:

The study revealed a significant rise in diabetes mellitus among young adults, largely driven by sedentary lifestyles, poor dietary habits, and genetic predisposition. Unhealthy eating patterns and physical inactivity were strongly associated with increased risk, while obesity emerged as a major contributing factor. Stress and sleep disturbances also played a crucial role in disease onset. Preventive strategies, including lifestyle modifications, early screening, and public health initiatives, were found to be essential in reducing incidence rates. These findings underscored the urgent need for targeted interventions to curb the growing burden of diabetes in young populations and promote long-term health.



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