International Journal of Research in Medical Sciences
Kaleka AS et al. Int J Res Med Sci. 2026 Mar;14(3):1092-1097
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20260630

Original Research Article

Awareness of diabetes and lifestyle practices among patients attending tertiary care hospitals in Patiala, Punjab

Amritpal Singh Kaleka, Manpreet Kaur, Manmeet Pal Kaur*

Department of Zoology and Environmental Sciences, Punjabi University, Patiala, Punjab, India

Received: 01 January 2026
Revised: 07 February 2026
Accepted: 12 February 2026

***Correspondence:**
Dr. Manmeet Pal Kaur,
E-mail: manmeetpal37@gmail.com

ABSTRACT

Background: India often referred to as the "diabetes capital of the world," faces a growing diabetes burden driven by sedentary lifestyles, unhealthy dietary habits, and limited awareness. Punjab, in particular, has shown a steep rise in diabetes prevalence. The present study has been carried with the aim to assess awareness and lifestyle behaviors among diabetic patients in Patiala, Punjab for identifying existing gaps for effective management and education.
Methods: A cross-sectional survey was conducted among 100 diabetic patients attending outpatient departments of three hospitals in Patiala. The socio-demographic information, diabetes awareness (blood glucose monitoring, HbA1c testing, eye screening), and lifestyle practices (diet, exercise and substance use) have been documented.
Results: The majority of participants had a balanced gender ratio, were between the ages of 60 and 70, and had a significant percentage of positive family histories of diabetes. Only over half of the participants knew their target glucose levels, despite the fact that regular blood sugar monitoring (92%) and HbA1c testing (86%) were routine. There was a high rate of medication adherence, but with little professional nutrition advice or eye examination. Though alcohol consumption and smoking were observed uncommon, but physical inactivity became a major concern.
Conclusions: In conclusion, there are still knowledge gaps in glycemic objectives, preventative screenings, and physical exercise despite good treatment compliance and frequent monitoring. To improve long-term disease outcomes in Punjab, focused diabetes education and lifestyle modification programs are crucial.

Keywords: Awareness, Diabetes mellitus, HbA1c, Lifestyle practices

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disease marked by increased blood glucose levels caused by deficiencies in insulin secretion, action, or both.[1,2] It was first identified by the Egyptians and subsequently termed by Greek physician Aretaeus. Chronic hyperglycemia increases morbidity and mortality by causing long-term problems that impact the kidneys, eyes, nerves, and cardiovascular system.[3,4] Diabetes causes about one death every ten seconds worldwide, more than HIV/AIDS.[4]

India is often referred as diabetes capital of the world, with more than 101 million adults currently living with diabetes.[5] This increase has been mostly caused by rapid urbanization, aging populations, poor eating habits, and decreased physical exercise.[6,7] Punjab, in particular, has seen a sharp rise in diabetes prevalence due to its shift towards sedentary lifestyle and high-calorie diet.[8]

Awareness and lifestyle management play a pivotal role in effective diabetes control. The previous studies conducted in India revealed that although many patients monitor their blood glucose regularly, there is still a lack of knowledge about target glucose levels, HbA1c readings and complication screening.[9,10] Additionally, lifestyle choices including food, exercise, and abstaining from alcohol and tobacco have a big impact on disease outcomes and glycemic control.[11,12]

Considering these factors, the current study has been conducted to evaluate diabetes patients' awareness and lifestyle choices in Patiala, Punjab. In order to identify important gaps and possible areas for focused diabetes education and preventive treatments, the study sought to investigate the association between socio-demographic traits, awareness levels, and lifestyle practices.

METHODS

Study design

The present study was a cross-sectional, questionnaire-based survey conducted in Patiala city, Punjab, with the aim to assess the level of diabetes awareness and lifestyle practices among diabetic patients. The survey was carried across three healthcare institutions namely Aggarwal Hospital, Manipal Hospital, and Government Rajindra Hospital, Patiala during the duration of August 2024 to September 2025. These hospitals were selected to ensure inclusion of patients from diverse socio-economic and demographic backgrounds, thereby improving the representativeness of the study population.

Sampling

A total of 100 diabetic patients were included in the present study. The participants were selected through convenience sampling from the outpatient departments (OPDs) of these hospitals. Both male and female patients diagnosed with diabetes mellitus were eligible to participate. The patients who were unwilling to respond or critically ill were excluded from the study. To ensure unbiased responses, the participants were not pre-informed about the survey's objectives of the data collection. Each respondent provided verbal consent before participation.

Data collection

The data were collected using a structured questionnaire designed to assess multiple aspects of diabetes awareness and lifestyle practices. The questionnaire consisted of multiple-choice questions divided into the following sections: personal information: age, gender, education level and residence etc. Lifestyle and habits: dietary practices, physical activity, and substance use. Awareness and knowledge: testing blood sugar, HbA1c test, follow-up visits.

The questionnaire was administered through face-to-face interviews conducted in the local language to ensure clarity and accuracy of responses.

Ethical considerations

The permission to conduct the study was obtained from the respective hospital authorities. The participants were assured that their responses would be used solely for research purposes, and their identities would remain confidential.

RESULTS

Demographic profile

The present case study of 100 patients surveyed from Patiala city, Punjab revealed that diabetes affected all age groups but major proportion belonged to 60-70 years of age which aligns with epidemiological patterns where age is a major risk factor. The gender distribution is also fairly balanced, with a small difference between the two groups (male and female). A significant proportion of patients surveyed, reported having a family history of diabetes, indicating a strong genetic component. Other socio-demographic factors like residence, education, mean duration of disease in subjects has been mentioned in Table 1. Out of these surveyed patients, the majority of individuals rely on oral medication, 16% depend solely on insulin and 12% use both oral medication and insulin. Only 6% are not on any medication, possibly due to early-stage diagnosis, lifestyle control or non-compliance. Co-morbidities were recorded in more than 50% of patients with hypertension to be the most common complication found along with diabetes.

Table 1: The socio-demographic characteristics of the patients surveyed (n=100).

Socio-demographic characteristics	Subjects
Male/Female	44/56
Mean Age	54.66±16.66
Rural/Urban	26/74
Education	
Post graduate	14
Tertiary (graduate)	14
Secondary (12th)	38
Primary (10th)	24
No education	10
Mean duration DM in years	12.02±10.08
Positive family history	34
Co-morbidities	
Hypertension	18
Heart disease	2
Kidney disease	2
Other	12
No	16

Awareness

To determine the awareness about diabetes, the patients were asked eight questions and their awareness regarding the disease was analysed according to their answers.

In terms of blood sugar monitoring, majority of respondents (92%) reported that they test their blood sugar levels, indicating a high level of health awareness and proactive monitoring (Table 2). This is a positive sign, especially in managing or preventing diabetes, as regular blood sugar monitoring is essential for early detection and

control of blood glucose levels. Another critical area is awareness about target blood sugar levels. The data showed that a little over half of the patients clearly knew their sugar targets, while others either somewhat understood or did not know their goals. This is concerning, as lack of awareness about target ranges can lead to poor glycemic control. The patients need to understand their optimal glucose levels, both fasting and postprandial, as well as their HbA1c goals. Without knowing this, even the most consistent efforts in testing and medication adherence may fall short of achieving desired health outcomes. Furthermore, the data revealed that 86% of respondents have undergone the HbA1c test, which reflects a high level of awareness and proactive health monitoring among the surveyed population. In context of diabetes management, HbA1c testing is essential for understanding long-term glycemic control, as it reflects average blood glucose levels over past 2-3 months. However, 14% have not undergone this test, which suggests there is still a small segment that may lack access, awareness or motivation to monitor their condition effectively.

Table 2: Frequency of awareness factors observed in the sample.

Awareness factors		Frequency
Test blood sugar	No	12
	Yes	88
Know targets	Not really	8
	Somewhat	24
	Yes	66
HbA1c	No	14
	Yes	86
Missed meds (medicine adherence)	Never	70
	Occasionally	18
	Often	12
Meal plan	I try to	22
	No	4
	Not really	14
	Yes, strictly	60
Diet help	Dietitian	50
	Doctor	14
	Myself	24
	No one	12
Doctor consultation	Annually	8
	Every Six months	14
	Every three month	26
	Monthly	50
Eye check-ups	Once in 2-3year	18
	Every year	28
	Never	44

The frequency of doctor visits among these patients suggests that many individuals are actively engaged in routine medical follow-up. A large number of patients reported visiting their healthcare provider on a monthly basis, while several others mentioned attending check-ups every three months. These visit intervals are generally consistent with standard diabetes care protocols, where patients especially those on insulin or with coexisting conditions are advised to undergo regular evaluations. A smaller subset reported visiting their doctor only annually or every six months, which may be insufficient for closely monitoring glycemic control or detecting early signs of complications. The regular and timely medical consultations are essential not only for reviewing blood sugar levels and medication efficacy but also for providing ongoing education and screening for secondary complications.

A critical component of diabetes follow-up is eye screening. Diabetic retinopathy is a common and potentially blinding complication of long-standing diabetes, making annual eye examinations essential. However, the data revealed a concerning trend, while some patients reported undergoing eye check-ups every year, a significant portion admitted to have eye exams every 2-3 years, less often, or even never. The lack of regular eye screening among a considerable number of patients indicates a major gap in preventive ophthalmic care. This gap could be due to limited access to specialists, lack of awareness or underestimation of risk.

When it comes to medication adherence, most patients reported that they never miss their medications, indicating a good level of compliance, awareness. However, a few patients admitted to miss their doses either occasionally or often, which can significantly affect blood sugar control and long-term outcomes.

Half of the respondents (50%) revealed to rely on dietitians to plan their diet, which is a highly positive indicator of structured and professional dietary support, crucial for diabetes management. 24% plan their diet themselves, which may reflect self-awareness, discipline or access to resources. However, there's also a risk of unbalanced or uninformed planning without professional guidance. 14% depend on their doctor, indicating that medical professionals still play a role in dietary advice, though it's less common than dietitians. 12% had no one helping them. Only a minimal number of people always read the labels, indicating a low overall frequency of label reading for sugar and carbs indicating lack of awareness about checking labels for keeping a record of sugar and carbs intake levels.

Lifestyle practices

A person's general routine and lifestyle practices are integral to assess the overall quality of diabetes management, prevention of complications and effectiveness of long-term care strategies. Hence, to analyse the lifestyle practices of the patients, five questions regarding their routines were asked.

To begin with, most patients claimed to consume sugary foods only rarely and a smaller number said they never eat

such food. This showed that majority patients are aware of the dietary restrictions and make efforts to reduce high-glycemic foods in their meals. However, rare consumption does not necessarily mean optimal glycemic control, as portion size and frequency still matter significantly.

Table 3: Frequency of lifestyle factors observed in the sample.

Lifestyle Factors		Frequency
Sugary food	Daily	2
	In week	14
	Never	30
	Rarely	54
Exercise type	Gym	2
	Home workouts	12
	I don't exercise	36
	Walking	50
Smoke	Never	90
	Not sure	2
	Quit	4
	Yes	4
Alcohol	Never	78
	No	2
	Occasionally	4
	Rarely	16
Sleep	<8 hrs	30
	>5 hrs	12
	5-6 hrs	14
	7-8 hrs	44

While examining lifestyle habits, a large proportion of patients do not perform regular exercise, which is of great concern due to the importance of physical activity in managing diabetes (Table 3). Among those who exercised, walking is observed as the most common form, followed by home workouts. When asked about their comfort with exercise, answers varied. Some patients reported feeling comfortable or somewhat comfortable, while others admitted their feeling of discomfort or responded with 'I don't know'. This indicates potential barriers to exercise, such as physical limitations, lack of guidance, or fear of adverse events such as hypo-glycemia or fatigue.

The received responses also revealed a notably low prevalence of smoking, which is encouraging. The majority of the patients reported that they never smoked, with only one individual stating he had quit smoking. The smoking significantly increases the risk of cardiovascular disease, stroke and peripheral vascular disease, all of which are more common in diabetic individuals and the absence of smoking is a positive indicator for long-term health outcomes.

Similarly, alcohol consumption was reported to be rare or non-existent among most patients. A few individuals mentioned about drinking occasionally or rarely, which may still pose risks depending on the quantity and frequency. Alcohol can interfere with blood glucose levels and medication metabolism, especially in insulin users, thus its intake should always be carefully monitored and discussed during clinical consultations.

Sleep duration, another vital aspect of overall health, is reported by most patients to be within the recommended range of 7-8 hours per night. Adequate sleep is known to improve insulin sensitivity, regulate appetite hormones and reduce stress, all of which play a role in glycemic control. However, some individuals reported sleeping less than 8 hours, with a few sleeping as little as 5 to 6 hours. Sleep deprivation has been linked to increased risk of obesity, poor blood sugar control and even depression, making it an important, though often overlooked area of lifestyle intervention in diabetes management

DISCUSSION

Awareness

The present study highlighted encouraging yet incomplete levels of diabetes awareness and self-care among patients from Patiala city, Punjab. The majority patients underwent HbA1c testing (86%) and showed awareness of blood sugar monitoring (92%), indicating active participation in glycemic control. Only around half, however, knew their target glucose level indicating ongoing information gaps that may impede the best possible treatment of the condition. A national level survey of Indian adults of 45 years of age and older revealed similar results; only 60.1% of them knew they had diabetes, and even fewer of them had adequate glycemic control.[13]

Another Indian study highlighted the importance of access to healthcare and education, with urban inhabitants demonstrating greater awareness (58.4%) than their rural counterparts (36.8%).[14] The present findings are consistent with estimates from around the world showing that about 60% of diabetic patients are aware of their illness, fewer achieve sufficient control.[15]

Our study's high medication adherence is in line with earlier results from the middle east and India that showed high compliance but little lifestyle change.[16,17] The studies from Saudi Arabia and Ghana, where over 70% of diabetics were aware that diabetes impairs eyesight but less than half attended yearly eye exam, confirm that insufficient eye screening are still major concerns.[18,19]

In order to fill awareness-practices gaps and enhance long-term patient outcomes, these findings highlight the necessity of comprehensive diabetes and education programs that emphasize lifestyle adjustment, regular follow-ups, and complication screening.

Lifestyle practices

A key component of managing diabetes is changing one's lifestyle, which affects both long-term consequences and

glycemic control. The present investigation demonstrated that regular exercise is significantly insufficient, even though the majority of Patiala patients reported minimizing intake of sugary foods and abstaining from alcohol and smoking. This pattern is consistent with worldwide and Indian patterns, where despite good medication adherence, food and physical inactivity continue to be major obstacles.

Similar results were found in study carried out in Gujarat, which reported that the majority of diabetic patients took their prescriptions as directed, fewer than half followed dietary guidelines or participated in regular exercise.[20] Similarly, qualitative research from northeast India revealed that stress, high-carb diets, and sedentary lifestyles are frequently cited as causes of diabetes, indicating a deeply rooted behavioural and cultural component influencing disease treatment.[21] Over 50% of diabetics in India do not reach their glycemic goals because of an inadequate diet and little exercise, according to another national assessment.[22]

Globally, lifestyle factors continue to play a pivotal role in diabetes outcomes. According to study conducted in US, the adherence to a composite healthy lifestyle, which includes a balanced diet, regular exercise, non-smoking status, moderate alcohol use, is linked to 50% decrease in microvascular problems among type 2 diabetes.[23] In a comparable manner, a European population study discovered significant correlations between poor diet, smoking and physical inactivity with greater rates of diabetes and worse metabolic profiles.[24] These findings support the idea that long-term health outcomes are largely determined by sustainable behavioural changes, even though pharmacological control is still crucial.

The majority of participants in the present study abstained from alcohol and smoking, which is encouraging and consistent with results of earlier studies from our country.[25,26] Poor physical activity participation, however, highlights the necessity of organized community-based interventions that encourage exercise and consistent observation. The majority respondents reported adequate sleep, but some reported shorter sleep durations, which may lead to insulin resistance, according to international research that links sleep deprivation to higher HbA1c values.[27]

Overall, the present results highlight the substantial gaps in physical activity and preventive practices that persist despite good knowledge of medication and diet. Combining patient education with lifestyle counselling, customized follow-ups, and culturally appropriate interventions could enhance adherence and long-term glycemic control in Indian diabetic populations.

The cross-sectional methodology and brief research duration restrict the capacity to evaluate casual linkages and long-term changes in diabetes awareness and lifestyle habits. Employing convenience sample from tertiary care facilities may limit the applicability of results to the broader community, especially rural populations. Comprehensive evaluation of diabetes management is further limited by comparatively small sample size and lack of objective clinical parameters. Further research involving larger, community-based samples and longitudinal designs is recommended to better understand long-term trends in diabetes awareness and lifestyle behaviours.

CONCLUSION

This study offers significant insights into diabetes awareness and lifestyle patterns among patients in tertiary care hospitals in Patiala, Punjab. The results demonstrate that most patients consistently monitor blood glucose levels, participate in HbA1c testing, and adhere well to their prescribed medications, but notable deficiencies remain in their understanding of target glycaemic objectives, preventive complication screening and involvement in regular physical activity. Inadequate engagement in physical activity and inconsistent eye check-ups continue to be significant issues despite regular medical oversight. Although the low rates of alcohol and smoking and dietary moderation are positive, but insufficient lifestyle changes and lack of competent nutrition advice may have a negative impact on long-term glycaemic management. Incorporating patient-centred education with community-based lifestyle treatments might significantly enhance diabetes outcomes and diminish the burden of complications in Punjab.

ACKNOWLEDGEMENTS

The authors are thankful to all the patients who participated in this survey. The help and coordination provided by the staff of all three hospitals is also acknowledged.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Polonsky KS. The past 200 years in diabetes. N Engl J Med. 2012;367:1332-40.
2. American Diabetes Association. Standards of medical care in diabetes- 2024. Diabetes Care. 2024;47(Suppl. 1):S1-2100.
3. Zimmet P, Alberti KG, Magliano DJ, Bennett PH. Diabetes mellitus statistics on prevalence and mortality: facts and fallacies. Nat Rev Endocrinol. 2016;12:616-22.
4. World Health Organization. Global report on diabetes. Geneva: WHO; 2023.
5. International Diabetes Federation. IDF Diabetes Atlas. 10th edn. Brussels: IDF; 2024.

6. Tripathy JP, Thakur JS, Jeet G, Chawla S, Jain S. Urban-rural differences in diet, physical activity and obesity in India: are we witnessing the great Indian equalisation? Public Health Nutr. 2017;20:2493-21003.
7. Anjana RM, Deepa M, Pradeepa R, Mahanta J, Narain K, Das HK, et al. Prevalence of diabetes and prediabetes in 15 states of India: results from the ICMR-INDIAB population-based cross-sectional study. Lancet Diabetes Endocrinol. 2017;5:585-96.
8. Singh K, Kaur H, Kaur P. Prevalence and risk factors of type 2 diabetes mellitus in urban and rural Punjab. Int J Res Med Sci. 2019;7:2134-9.
9. Kumar P, Sharma N, Sharma S, Singh D, Sharma P. Awareness and practices regarding diabetes among diabetic patients attending a tertiary care hospital in North India. Int J Community Med Public Health. 2018;5:2832-7.
10. Shrivastava SR, Shrivastava PS, Ramasamy J. Role of self-care in management of diabetes mellitus. J Diabetes Metab Disord. 2013;12:14.
11. Jali MV, Kambar S, Jali SM, Hiremath MB, Dinesh PV. Self-care practices among type 2 diabetes patients in a tertiary care hospital, South India. J Clin Diagn Res. 2016;10:OC01-4.
12. Mohan V, Kalra S, Bajaj S, Manickam S, Dutta D, Kesavadev J, et al. Physical activity and diabetes management in India: consensus recommendations. Diabetes Metab Syndr Obes. 2022;15:1239-52.
13. Tripathy JP, Thakur JS, Jeet G, Chawla S, Jain S, Pal A, et al. Prevalence and awareness of diabetes in India: results from the longitudinal ageing study in India (LASI), 2017-18. BMC Public Health. 2023;23:534.
14. Mohan D, Raj D, Shanthirani CS, Datta M, Unwin NC, Kapur A, et al. Awareness and knowledge of diabetes in Chennai- the Chennai Urban Rural Epidemiology Study (CURES-9). J Assoc Phys India. 2005;53:283-7.
15. Saeedi P, Petersohn I, Salpea P, Malanda B, Karuranga S, Unwin N, et al. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: results from the International Diabetes Federation Diabetes Atlas, 9th edition. Diabetes Res Clin Pract. 2019;157:107843.
16. Gajjar S, Patel R, Patel N, Joshi M, Patel K, Kedia M. Knowledge, attitude and practice among patients of type 2 diabetes mellitus in Ahmedabad, Gujarat: a cross-sectional study. Int J Community Med Public Health. 2019;6:2941-6.
17. AlQarni AM, AlQarni EA, Naqvi AA, Ahmad R, Ahmad N, AlShayban DM, et al. Assessment of medication adherence in Saudi patients with type II diabetes mellitus using the Morisky Medication Adherence Scale (MMAS-8). Saudi Pharm J. 2019;27:390-9.
18. Alrasheed R, Ibrahim A, Alobaikan A, Alshaikh A, Alrasheed M, Alayed M, et al. Awareness of diabetic retinopathy among diabetic patients in Riyadh, Saudi Arabia. J Fam Med Prim Care. 2020;9:6038-44.
19. Ocansey S, Abu EK, Owusu-Ansah A, Boadi-Kusi SB, Ilechie AA, Darko-Takyi C, et al. Ocular health awareness and practice of eye screening among diabetic patients attending a tertiary hospital in Ghana. BMC Ophthalmol. 2022;22:19.
20. Patel A, Mehta H, Chavda N, Shah D. Self-care practices and influencing factors among type 2 diabetic patients in Gujarat, India. Diabetes Metab Syndr Clin Res Rev. 2024;18:102956.
21. Das R, Singh L, Lotha J. Living with diabetes in Northeast India: an exploration of diet, lifestyle and self-care. Prim Care Diabetes. 2024;18:34-42.
22. Saini R, Bansal P, Kapoor A. Diabetes and current Indian scenario: a narrative review. J Diabetes Obes Disord. 2024;15:12-20.
23. Liu G, Li Y, Pan A, Hu Y, Chen S, Qian F, et al. Adherence to a healthy lifestyle in association with microvascular complications among adults with type 2 diabetes. JAMA Netw Open. 2023;6:e2252239.
24. Martins C, Ferreira R, Novak D. Lifestyle and metabolic risk factors among European adults: European Health Interview Survey 2024. Sci Rep. 2024;14:2158.
25. Kumar S, Prasad S, Sharma N. Awareness and lifestyle practices among diabetic patients in North India. Indian J Endocrinol Metab. 2018;22:682-9.
26. Mohan V, Anjana RM, Unnikrishnan R. Lifestyle modification in diabetes management: lessons from Indian experience. Diabetes Ther. 2022;13:1723-35.
27. Anothaisintawee T, Reutrakul S, Van Cauter E, Thakkinstian A. Sleep disturbances compared to traditional risk factors for diabetes in relation to glycemic control. Sleep Med Rev. 2016;30:11-24.

Cite this article as: Kaleka AS, Kaur M, Kaur MP. Awareness of diabetes and lifestyle practices among patients attending tertiary care hospitals in Patiala, Punjab. Int J Res Med Sci 2026;14:1092-7.