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Original Research Article

AWARENESS OF TYPE 2 DIABETES MELLITUS AMONG IT EMPLOYEES: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder with a rising prevalence, particularly among sedentary working populations. Awareness and preventive practices are crucial for reducing long-term complications. This study aimed to assess T2DM awareness, lifestyle practices, and barriers among IT employees.

Materials and Methods: A cross-sectional questionnaire-based study was conducted among 150 IT employees aged ≥18 years at a tertiary care hospital in India, using a structured, pre-validated tool to assess knowledge, attitudes, and health practices related to T2DM. Data were analysed using descriptive statistics, correlation, and ANOVA to examine associations with demographic factors.

Results: Among participants, 98 (65.3%) had good knowledge, 45 (30%) moderate, and 7 (4.7%) poor knowledge. Correct knowledge of recommended exercise and HbA1c was reported by 86 (57.3%) and 72 (48%), respectively. Regarding health practices, 102 (68%) engaged in ≥150 minutes of physical activity weekly, 114 (76%) consumed high-fibre foods, 105 (70%) limited high-sugar/junk foods, and 86 (57.3%) underwent annual health check-ups, with 67 (44.7%) demonstrating overall good practice. Knowledge and practice showed a weak positive correlation ($r=0.155$, $p=0.058$). Practice scores were significantly higher among postgraduates ($F=26.67$, $p<0.001$) and older age groups ($F=11.50$, $p<0.001$), while gender differences were not significant. The most common barriers were lack of time (33.3%) and fatigue (22.7%).

Conclusion: Most IT employees had good knowledge of T2DM, fewer translated this into effective preventive practices. Targeted workplace interventions addressing knowledge, motivation, and contextual barriers are essential for promoting healthier lifestyle behaviours.

Keywords: Awareness, Cross-sectional Study, Health Practices, IT Employees, Type 2 Diabetes Mellitus, Workplace Intervention.

INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder characterised by insulin resistance and relative insulin deficiency, resulting in persistent hyperglycaemia. It develops when cells fail to respond effectively to insulin, and the pancreas cannot produce adequate amounts of insulin to compensate. If left uncontrolled, T2DM can lead to microvascular complications, including cardiovascular disease, nephropathy, neuropathy, and retinopathy.[1,2] The prevalence of diabetes continues to rise globally. According to the International Diabetes Federation (IDF), approximately 537 million adults were living with diabetes in 2021, with projections indicating a rise to

783 million by 2045.[3] India is among the nation's most severely affected, driven by rapid urbanisation, lifestyle transitions, and dietary changes.[4,5]

T2DM shares common risk factors with other non-communicable diseases (NCDs), including obesity, hypertension, cardiovascular disease, and cancer. Major contributors include physical inactivity, poor dietary patterns, smoking, and harmful alcohol use.[6,7] Landmark randomised controlled trials have demonstrated that lifestyle modifications, particularly structured physical activity and improved nutrition, can significantly delay or prevent the onset of T2DM.[8,9] Despite this evidence, awareness and adoption of preventive measures remain suboptimal, especially among younger and working populations in India. IT professionals are particularly vulnerable, given their sedentary jobs, long screen exposure, irregular diets, and stress-filled environments.[10,11] Previous studies highlight that workplace-based interventions, such as structured wellness programs, nutrition counselling, and physical activity initiatives, can improve knowledge and potentially reduce risk factors.[12,13]

A cross-sectional study conducted among office workers revealed that only 27.8% of participants had good knowledge of T2DM, with a significant association between family history and higher knowledge scores. Despite nearly 60% engaging in physical activity, approximately 50% exhibited poor diabetes prevention practices, underscoring the need for targeted workplace interventions to enhance awareness and preventive measures among employees.[14] Against this backdrop, the present study aimed to assess the awareness of T2DM among IT employees, examine the influence of lifestyle and demographic variables on practices, and suggest workplace interventions to improve diabetes-related health behaviours.

MATERIALS AND METHODS

Study design and setting: This cross-sectional, questionnaire-based study was conducted among 150 IT sector employees at a tertiary care hospital in India over 12 months. The study was approved by the Institutional Ethics Committee, and written informed consent was obtained from all participants prior to enrolment.

Inclusion Criteria

The study included employees aged 18 years and above who had been continuously employed in the IT sector for at least six months and were willing to participate after providing their written informed consent.

Exclusion criteria

Employees with cognitive impairments or psychiatric disorders that could affect their understanding of the questionnaire, and individuals not currently employed in the IT sector.

Methods: Data were collected using a structured, pre-validated questionnaire developed after reviewing prior studies and the WHO STEP wise approach for non-communicable diseases. The instrument was pilot-tested on 30 IT employees to ensure clarity, content validity, and internal consistency, yielding a Cronbach's alpha of 0.82. Therefore, we taken 150 participants for final analysis. The questionnaire included sections on demographic characteristics, knowledge of T2DM aetiology and complications, attitudes and lifestyle practices related to diet and physical activity, and barriers to healthy behaviours.

After obtaining permission from the participating organisations, the study objectives and procedures were explained, eligible employees were approached during routine health checkups and wellness programs. Questionnaires were administered either in paper-based or digital format according to the participant's preference, with completion taking approximately 15–20 minutes. The primary outcome measured was the level of T2DM awareness, categorised as good, moderate, or poor based on scoring criteria. The secondary outcomes included the assessment of lifestyle practices, identification of barriers to healthy behaviours, and evaluation of associations between knowledge and practice scores across demographic subgroups.

Statistical analysis: All data were entered into Microsoft Excel and subsequently analysed using SPSS v22. Continuous variables are presented as mean ± standard deviation, and categorical variables are expressed as frequencies and percentages. Comparisons were conducted using independent sample t-tests and one-way ANOVA, and Pearson's correlation was used to assess the relationship between the knowledge and practice scores. Statistical significance was set at $p < 0.05$ with a 95% confidence interval.

RESULTS

Among the participants, 73 (48.6%) were aged 18–30 years, 62 (41.3%) were 31–45 years old, and 15 (10%) were 46–60 years old. Most were male (104, 69.3%) and had an undergraduate-level education (86, 57.3%). A total of 78 (52%) participants had a family history of diabetes [Table 1].

Table 1: Demographic characteristics

Variable	Category	N (%)
Age (years)	18–30	73 (48.6%)
	31–45	62 (41.3%)
	46–60	15 (10%)
Gender	Male	104 (69.3%)
	Female	46 (30.7%)

Education	Undergraduate	86 (57.3%)
	Postgraduate	64 (42.6%)
Family history of diabetes	Yes	78 (52%)
	No	72 (48%)

Among the participants, 98 (65.3%) had good overall knowledge, 45 (30%) had moderate knowledge, and 7 (4.7%) had poor knowledge of diabetes. Regarding specific knowledge items, 86 (57.3%) correctly identified the recommended exercise, 72 (48%) knew that HbA1c reflects the average glucose over 2–3 months, 70 (46.6%) recognised the pancreas as the primary organ affected, and 60 (40%) correctly reported normal fasting glucose levels. In terms of health practices, 102 (68%) engaged in ≥150 min of physical activity per week, 114 (76%) consumed high-fibre foods daily, 99 (66%) avoided late-night snacking, 105 (70%) limited high-sugar or junk foods, and 86 (57.3%) underwent annual master health check-ups. Overall, 67 (44.7%) demonstrated good practice, 59 (39.3%) had neutral practice, and 24 (16%) had poor practice [Table 2].

Table 2: Knowledge and health practices

Variable	Category	N (%)
Knowledge level	Good	98 (65.3%)
	Moderate	45 (30%)
	Poor	7 (4.7%)
Specific knowledge items	Correct knowledge of recommended exercise	86 (57.3%)
	Identified HbA1c as an average of 2–3 months of glucose	72 (48%)
	Recognised the pancreas as the primary organ affected	70 (46.6%)
	Correctly identified normal fasting glucose	60 (40%)
Specific health practices	≥150 min physical activity/week	102 (68%)
	Daily intake of high-fibre foods	114 (76%)
	Avoidance of late-night snacking	99 (66%)
	Limiting high-sugar/junk food	105 (70%)
	Annual master health check-up	86 (57.3%)
Overall practice score	Good practice	67 (44.7%)
	Neutral practice	59 (39.3%)
	Poor practice	24 (16%)

Knowledge and practice scores were higher among participants with a postgraduate education (mean knowledge 7.13 ± 2.22, practice 7.03 ± 2.12) than among undergraduates (6.92 ± 1.61 and 5.18 ± 2.18, respectively), with a significant difference in practice scores ($F = 26.67$, $p < 0.001$). Scores also increased with age: participants aged 31–45 years (knowledge 7.14 ± 1.95, practice 6.52 ± 2.22) and 46–60 years (7.20 ± 2.01, 7.12 ± 2.05) had higher scores than those aged 18–30 years (6.91 ± 1.70, 5.29 ± 2.10), with a significant difference in practice scores ($F = 11.5$, $p < 0.001$) [Table 3].

Table 3: Association of knowledge and practice with demographics

Variable	Category	Knowledge	Practice	F-value	p-value
Educational level	Undergraduate	6.92 ± 1.61	5.18 ± 2.18	26.67	<0.001
	Postgraduate	7.13 ± 2.22	7.03 ± 2.12		
Age group (years)	18–30	6.91 ± 1.70	5.29 ± 2.10	11.5	<0.001
	31–45	7.14 ± 1.95	6.52 ± 2.22		
	46–60	7.20 ± 2.01	7.12 ± 2.05		

The most common barriers to physical activity were lack of time due to work or family responsibilities (50, 33.3%) and participants who continued activity despite barriers (45, 30%), while lack of motivation was reported by 12 (8%). Regarding dietary practices, 49 (32.7%) reported no major issues, whereas 28 (18.7%) cited lack of time to prepare healthy meals, and 5 (3.3%) found healthy foods expensive. Post-work inactivity was mainly due to feeling tired or exhausted (34, 22.7%), with fewer participants reporting distractions from their screen time (7, 4.7%) or poor time management (8, 5.3%). Learning and sociocultural barriers included lack of family or friend support (32, 21.3%), conflicting online information (17, 11.3%), cultural norms prioritising quantity over quality (9, 6%), and lack of expert guidance (6, 4%) [Table 4].

Table 4: Reported barriers to healthy practices

Barrier	Category	N (%)
Physical activity barriers	Lack of time (work/family responsibilities)	50 (33.3%)
	Engaged despite barriers	45 (30%)
	Lack of motivation or interest	12 (8%)
Dietary barriers	No major issue	49 (32.7%)
	Lack of time to prepare healthy meals	28 (18.7%)
	Healthy foods are expensive	5 (3.3%)

Post-work inactivity barriers	Feeling tired/exhausted	34 (22.7%)
	Distractions from screen time	7 (4.7%)
	Poor time management	8 (5.3%)
Learning and sociocultural barriers	Conflicting online information	17 (11.3%)
	Lack of expert guidance	6 (4%)
	Lack of family/friend support	32 (21.3%)
	Cultural norms prioritising quantity over quality	9 (6%)

DISCUSSION

In our study, IT employees were mostly young adults, with the majority being male and holding undergraduate degrees. A considerable proportion of patients reported a family history of diabetes, suggesting hereditary risk factors. Similarly, Deepa et al,[14] surveyed 274 individuals across four Indian regions and found that 43.2% were aware of diabetes, with higher awareness among males (46.7%), urban residents (58.4%), and those with higher education compared to females (39.6%) and rural residents (36.8%).[15] In contrast, Alqahtani et al. studied 1,342 participants and reported that most were female (60.4%), aged ≥58 years (50.6%), and had low educational attainment, with only 11.1% having university-level education. The majority were married (87.2%) and resided in urban areas (86.8%).[16] Likewise, Wijesinghe et al. included 279 patients with a mean age of 56.17 years (range 18–85), predominantly male (72.4%) and married (83.3%).[17] Our study showed younger, educated males, while others reported older, less educated or female-dominant groups, reflecting demographic differences in diabetes awareness.

In our study, most participants demonstrated good knowledge of diabetes, although specific awareness regarding exercise, HbA1c, affected organs, and normal glucose levels was only moderate. Health practices were generally favourable, with many participants engaging in regular physical activity, maintaining a healthy diet, and undergoing annual checkups. Overall, a higher proportion of participants showed good practices, whereas fewer had neutral or poor practices. Similarly, Wakjira et al. reported that over half of the participants (53%) were inactive, 87.2% did not regularly consume fruits and vegetables, and the prevalence of high blood pressure, elevated blood sugar, and gestational diabetes was 19.7%, 18.8%, and 13.9% of females, respectively.[18] Likewise, Wijesinghe et al. found that 60.6% of the participants had very good knowledge (≥75%), 10% good (65–74%), 20.8% average (50–64%), 3.9% poor (40–49%), and 4.7% very poor (<40%). Knowledge gaps were seen for hypoglycaemia (49.1%), types of diabetes (29%), neuropathic symptoms (48.4%), and foot ulcer prevention (67.7%), while awareness of exercise (95%) and weight loss benefits (93.9%) remained high.[17] Janani et al. found that 63.7% had adequate knowledge, 86.8% were aware of diabetes symptoms, and 79.4% had adequate knowledge of management. However, complications were prevalent, with 74.4% having neuropathy and 66.7% maintaining good glycaemic control.[19] Overall, participants displayed good knowledge and habits, although gaps persist compared with mixed findings elsewhere.

In our study, awareness of exercise, glucose levels, and healthy dietary habits was moderate to good, with most participants showing good knowledge and a fair proportion demonstrating good practices. A positive but non-significant correlation was noted between knowledge and practice, indicating that greater awareness may encourage healthier behaviours, although not conclusively. Similarly, Alqahtani et al. found that 99.6% of participants were on diabetes medications, with 63% using oral hypoglycaemic agents and 21.7% using insulin. However, awareness of hypoglycaemia was low, with only 12.9% of the participants demonstrating good awareness. Most participants identified skipping meals (63.7%) and hypoglycaemic drugs (39.5%) as risk factors, but knowledge of prevention and complications was limited.[16] In contrast, Ramkumar et al. reported higher overall awareness (84.6%); however, lifestyle practices such as diet and exercise adherence were inadequate, highlighting a gap between knowledge and practical application.[20] Across studies, awareness levels and practices varied, but a consistent gap remained between knowledge and its practical application.

In our study, participants with higher education and older age demonstrated better knowledge and healthier practice. Postgraduates scored higher than undergraduates, and the practice scores showed a significant difference between the groups. Similarly, older participants had higher scores than younger participants, indicating that education level and age were positively associated with diabetes awareness and practices. Likewise, Wijesinghe et al. found that knowledge significantly increased with higher education ($p = 0.001$) and higher socioeconomic status ($p = 0.03$).[17] Similarly, Deepa et al. reported that awareness was higher among literates than illiterates (52.2% vs. 23.7%, $p < 0.001$) and greater in urban compared with rural residents, with regional differences and education being key determinants of knowledge and preventive awareness.[15] But also, Tamilarasan et al. reported that T2DM prevalence was significantly higher in the 36–50 (5.7%) and 51–65 (27.3%) age groups ($p = 0.001$). Education also showed significance, with participants with only secondary or primary education showing higher T2DM prevalence, whereas those with higher secondary or graduate education did not develop T2DM ($p < 0.001$).[21] This shows that both education and age emerged as significant factors shaping diabetes knowledge, preventive behaviours, and disease risk.

In our study, the main barriers to healthy practices were lack of time for physical activity or meal preparation, fatigue after work, and limited motivation. Sociocultural and learning barriers, such as inadequate support, conflicting information, cultural food habits, and a lack of expert guidance, further hindered lifestyle adoption among IT employees in this study. Similarly, Deepa et al. noted that knowledge of preventive measures, such as diet and exercise, was very low in the general population, with awareness of exercise at 3.1%, diet at 36.8%, and both at 45.8%, highlighting substantial gaps in translating awareness into practice.[15] Likewise, Tamilarasan et al. reported several lifestyle-related risk factors, including smoking (50.8%), alcohol consumption (74.6%), obesity or overweight (51.7%), hypertension (11.9%), and family history of hypertension (15.3%), which indirectly act as barriers to maintaining healthy practices.[21] Janani et al. did not directly report lifestyle barriers, but the high prevalence of complications such as neuropathy (74.4%) and hypertension (75%) implies advanced disease progression and possible adherence difficulties.[19] Therefore, the findings shows that both direct and indirect factors, including time, motivation, sociocultural influences, and comorbidities, act as major obstacles to diabetes prevention and control.

Limitations: This study was limited by its single-centre design and reliance on self-reported data, which may have introduced response bias. Additionally, the cross-sectional nature of the study precludes the assessment of long-term changes in awareness or practices.

CONCLUSION

Most IT employees demonstrated good knowledge of T2DM, particularly regarding exercise and dietary recommendations; however, fewer exhibited optimal preventive practices. Awareness and practice scores were higher among older and postgraduate participants than among their counterparts. The common barriers included time constraints and fatigue. These findings highlight the need for targeted workplace interventions to enhance diabetes awareness and promote healthier lifestyle behaviours among IT employees. Future research should explore the longitudinal outcomes of such interventions and assess their effectiveness in sustaining long-term healthy behaviours among IT employees.

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