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ORIGINAL ARTICLE

A Study on Assessing the Diabetic Risk Among Health Care Professionals in a Tertiary Care Hospital, Puducherry: A Cross-Sectional Study

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Abstract

Introduction: Diabetes is a chronic metabolic disorder marked by elevated blood glucose levels, with type 2 diabetes being the most prevalent form. As a non-communicable disease, diabetes poses a major public health challenge, and its prevalence is rising worldwide, reaching epidemic levels that may soon surpass those of communicable diseases in both developing and developed countries. **Objective:** To evaluate the risk of diabetes among doctors and nurses at a tertiary care hospital. **Methodology**: A hospital-based cross-sectional study was carried out among doctors and nurses at a tertiary care hospital in Puducherry from February to April 2022. Participants for the survey were selected using a simple random sampling method. **Results:** Most participants in the study were aged between 36 and 49 years, comprising 60.5% of the sample. Among them, 63.0% were male, and 65.5% resided in urban areas. The largest proportion had a normal BMI (51.5%), followed by overweight individuals (36.5%) and those classified as obese (7.5%). Additionally, 59.5% of participants exhibited abdominal obesity, 63.5% reported no physical activity, and 77.5% did not have a family history of diabetes. **Conclusion:** This study evaluates the effectiveness of a simplified Indian Diabetes Risk Score (IDRS) in identifying high-risk individuals within the working population. There is an immediate need to encourage for healthy lifestyle practices among doctors and nurses. Physicians should actively strive to implement the knowledge they possess daily.

Keywords: Blood glucose, Type 2 diabetes, Diabetes mellitus, Indian Diabetes Risk Score

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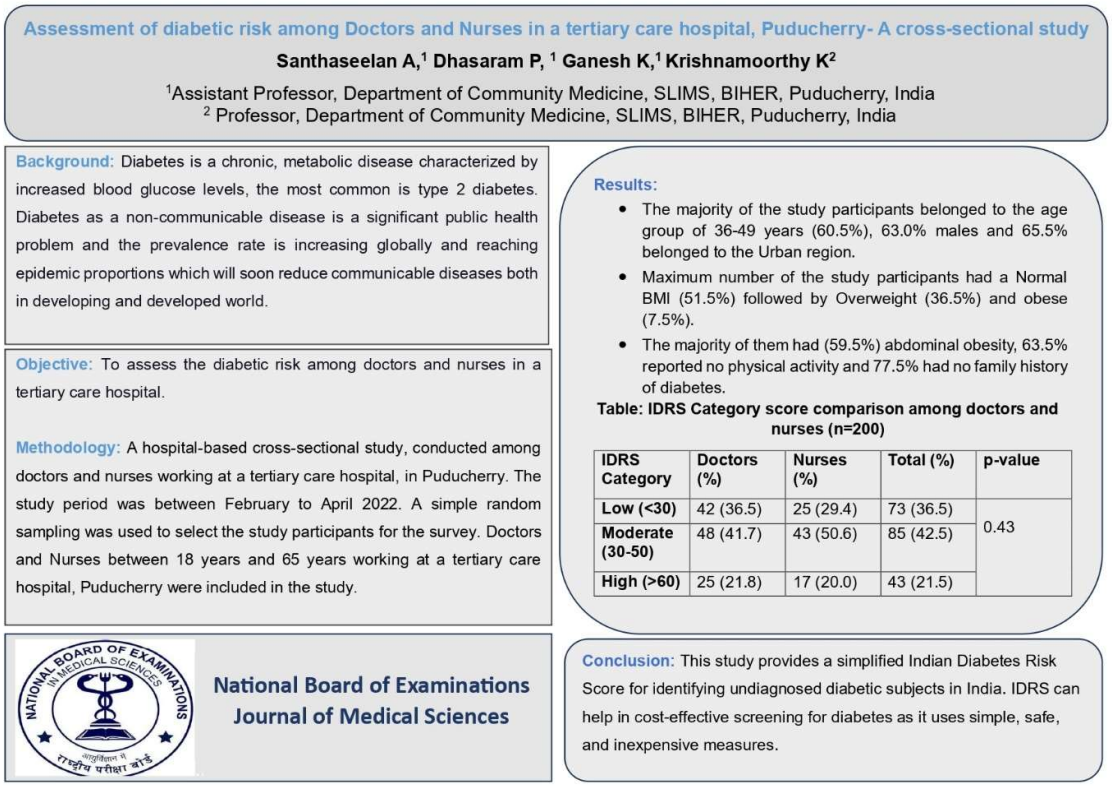
Graphical Abstract



Introduction

The world is currently grappling with a surge in non-communicable diseases (NCDs), with diabetes standing out as a major public health challenge due to its increasing prevalence globally. Diabetes is a chronic metabolic disorder defined by elevated glucose levels in the blood, primarily manifests as type II diabetes mellitus, which has become particularly common [1,2].

In India, the prevalence of diabetes among individuals aged over 45 was reported at 11.5% in 2021, as per a study by the Ministry of Health and Family Welfare. The country faces a significant burden of diabetes due to genetic predisposition and heightened susceptibility to environmental factors [3,4]. Recent data from the Indian Council of Medical Research underscores this, revealing an overall diabetes prevalence of 7.3% across 15 states [5].

Healthcare providers, such as doctors and nurses, play a crucial role in public health by ensuring the well-being of individuals. Their own health is vital as it directly impacts their ability to perform effectively in demanding work environments. Research indicates a strong link between healthcare providers' personal health choices and their advice to patients [6].

While doctors and nurses are expected to possess sound knowledge of cardiovascular diseases (CVDs), diabetes, and associated risk factors, their lifestyle habits often present challenges, they frequently lead sedentary lives, experience high stress levels, lack adequate rest, and have irregular eating patterns, predisposing them to diabetes and CVDs [7,8]. The

study was determined to assess the diabetic risk among healthcare professionals in a tertiary care hospital, Puducherry.

Methodology

The current study was a hospital-based cross-sectional investigation conducted among doctors and nurses at a tertiary care hospital in Puducherry. Data for the study were collected between February and April 2022. The sample size was determined using Cochran's formula $n= Z^2 pq / d2$ with a diabetes prevalence of 13.0% among health workers based on previous research and d=5. This calculation yielded a total sample size of 181, which was adjusted to 200 to account for a 10% non-response rate. A simple random sampling method was used to select the study participants.

Eligibility criteria

Inclusion criteria

Healthcare professionals, those aged 18-60 years working at the tertiary care hospital.

Exclusion criteria

- Visiting doctors
- Those who joined within the past year

Data collection tool

Written informed consent was obtained from all participants involved in the survey. A semi-structured questionnaire was used to interview the study participants. The following information obtained includes socio-demographic details and questions aimed at assessing the diabetes risk among healthcare professionals in a tertiary care hospital. Data like blood pressure, blood glucose levels, and anthropometric measurements were also collected. The cut-off values for the Waist-Hip Ratio (WHR) used to define central obesity were >0.85 for females and >0.9 for males. Participants with an IDRS score of < 30 were classified as low risk, those scoring between 30 to 50 were considered medium risk, and individuals with scores of 60 or higher were categorized as high risk. Participants with a diabetes risk score more than 30 were recommended to visit a hospital for blood sugar testing and follow-up.

Data analysis

The data collection form was assessed for valid entries and missing entries. Data entry was made in MS EXCEL 2019. Data coding was done in MS Excel and analyzed using IBM SPSS software version 16.0, Chicago, USA. Normally distributed values were presented as mean ± standard deviation whereas non-normally distributed values were presented as median. Categorical values were presented as proportions.

Results

The current study involved 200 participants at a tertiary care hospital in Puducherry. Most participants were in the age group of 36-49 years (60.5%), with 126 males and 74 females. Among the 200 participants, 89.5% identified as Hindus, 79.5% lived in nuclear families, and 65.5% resided in urban areas (Table 1). The largest group had a normal BMI (51.5%), followed by overweight individuals (36.5%) and those classified as obese (7.5%). Additionally, 59.5% of participants had abdominal obesity, 63.5% reported no physical activity, and 77.5% had no family history of diabetes (Table 2).

Table 1. Socio-demographic characteristics of the study participants (n=200)

Characteristics	Number (n)	Percentage (%)
Age Group		
<35	70	35.0
36-49	121	60.5
>50	9	4.5
Sex		
Male	126	63.0
Female	74	37.0
Religion		
Hindu	179	89.5
Muslim	13	6.5
Christian	8	4.0
Family type		
Nuclear	159	79.5
Joint	41	20.5
Place of residence		
Urban	131	65.5
Rural	69	34.5

Table 2. Factors associated with increased risk of diabetes among study participants (n=200)

Characteristics	Number (n)	Percentage (%)
BMI		
Underweight (<18.5)	9	4.5
Normal (18.5-24.99)	103	51.5
Overweight (25.0-29.99)	73	36.5
Obese (≥30.0)	15	7.5
Diet type		
Vegetarian	34	17.0
Mixed	166	83.0
Abdominal obesity		
Yes	119	59.5
No	81	40.5
Physical activity		
Yes	73	36.5
No	127	63.5
Family history of diabetes		
Yes	45	22.5
No	155	77.5

Table 3 presents the differences between doctors and nurses regarding socio-demographic information, personal data, and occupational characteristics. Factors such as history of other illnesses, night shifts, and work-related stress were found to be statistically significant ($p<0.05$).

Table 4 outlines the risk levels among doctors and nurses based on the IDRS risk score. Most doctors (41.7%) and nurses (50.6%) had a moderate risk score in the study. However, the differences were not statistically significant ($p>0.05$).

Table 3. Occupational characteristics among doctors and nurses (n=200)

Occupational characteristics		**Doctors (%)**	**Nurses (%)**	**Total (%)**	**p value**
		115 (57.5)	**85(42.5)**	**200(100.0)**	
Residence	Urban	81(61.8)	50(38.2)	131(100.0)	0.087
	Rural	34(49.3)	35(50.7)	69(100.0)	
History of other illness	Yes	45(58.4)	32(41.6)	77(100.0)	0.038
	No	70(56.9)	53(43.1)	123(100.0)	
Night shifts	Yes	95(54.6)	79(45.4)	174(100.0)	0.031
	No	20(76.9)	6(23.1)	26(100.0)	
Working duration (years)	<6	8(80.0)	2(20.0)	10(100.0)	0.012
	6-10	86(61.8)	53(38.2)	139(100.0)	
	>10	21(41.2)	30(58.8)	51(100.0)	
Work-related stress	Yes	83(58.8)	58(41.2)	141(100.0)	0.54
	No	32(54.2)	27(45.8)	59(100.0)	

Table 4. IDRS Category score comparison among doctors and nurses (n=200)

IDRS Category	**Doctors (%)**	**Nurses (%)**	**Total (%)**	**p value**
Low (<30)	42 (36.5)	25 (29.4)	73 (36.5)	0.43
Moderate (30-50)	48 (41.7)	43 (50.6)	85 (42.5)	
High (>60)	25 (21.8)	17 (20.0)	43 (21.5)	

Discussion

The current study aimed to evaluate the diabetes risk among healthcare professionals working in a tertiary care hospital in Puducherry. The results indicated that most participants had a normal BMI (51.5%), followed by overweight individuals (36.5%) and those classified as obese (7.5%). Similarly, Kumar et al. [2018] [10] study found that the majority of participants were of normal weight (73.0%), with overweight individuals comprising 16.0%.

In this present study, 77.5% of participants reported having no family history of diabetes, while 22.5% did have such a history whereas Vidya et al. study [11] observed that 64.4% of participants lacked a family history of diabetes. Family history is a recognized risk factor for developing type 2 diabetes mellitus (DM), making it a valuable tool for identifying individuals at risk for the condition. In the present study, only 36.5% of participants reported engaging in physical activity, whereas Singh et al. [12] study found that around 55.2% of their participants had done moderate to vigorous physical activity.

In the present study, socio-demographic profile and occupational characteristics were compared among doctors and nurses. Factors such as history of other illnesses, night shifts, and work stress were found to be statistically significant ($p<0.05$). Similarly, Kumar et al. [10] study compared socio-demographic and personal data among Class 1 and Class 2 workers in a tertiary care hospital, where age, gender, residence, history of other illnesses, night shifts, and work duration were not statistically significant.

In this study, the prevalence of moderate risk was observed in 42.5% of participants, which is higher compared to a study conducted by Ranadip et al. [13]. In the present study, 21.5% of participants were classified as high risk, which was lower than the 31.0% reported in the Kolkata study. The discrepancy in findings may be attributed to the fact that the Kolkata study focused on the general population rather than healthcare professionals. Additionally, a study by Brinda et al. [14] found the distribution of low, moderate, and high-risk IDRS scores to be 26.0%, 49.0%, and 26.0%, respectively, whereas in our study, the figures were 36.5%, 42.5%, and 21.5%.

Conclusion

The present study presents a simplified Indian Diabetes Risk Score (IDRS) aimed at identifying unknown diabetic people in India. The IDRS provides a cost-effective method for diabetes screening by utilizing simple, safe, and inexpensive approaches. It promotes targeted screening instead of universal screening. The prevalence of moderate risk was found to be 42.5% and 21.5% respectively in Doctors and Nurses, which raises significant concern. Therefore, there is a need for implementing diabetes education and stress prevention programs tailored to the hospital's working population.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

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References

1. Ramaiah R, Jayarama S. Assessment of risk of type 2 diabetes mellitus among rural population in Karnataka by using Indian diabetes risk score. Int J Community Med Public Health. 2017;4(4):1056.
2. Nandeshwar S, Jamra V, Pal DK. Indian Diabetes Risk Score for screening of undiagnosed diabetic subjects of Bhopal city. Natl J Community Med. 2015;1(2):176-7.
3. World Health Organization - Global report on diabetes. Available at: www.who.int/diabetes/global-report/. Accessed on 02 April, 2023.
4. Anjana RM, Deepa M, Pradeepa R, Mahanta J, Narain K, Das HK, et al.; ICMR–INDIAB Collaborative Study Group. 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.
5. Little M, Humphries S, Patel K, Dodd W, Dewey C. Factors associated with glucose tolerance, prediabetes, and type 2 diabetes in a rural community of south India: a cross-sectional study. Diabetology & metabolic syndrome. 2016;8(1):1.
6. Frank E. Physician Health and Patient Care. JAMA 2004;291(5):637.
7. Kay MP, Mitchell GK, Del Mar CB. Doctors do not adequately look after their own physical health. Med J Aust 2004;181:368-70.
8. Richards JG. The health and health practices of doctors and their families. NZ Med J 1999;112(1084):96-9.
9. Franch-Nadal J, Mediavilla-Bravo J, Mata-Cases M, Mauricio D, Asensio D, Sarroca J. Prevalence and control of type 2 diabetes mellitus among primary care physicians in Spain. PRISMA Study. Endocrinol Diabetes Nutr. 2017;64(5):265–271.
10. Kumar AK, Dixit UR. Assessment of diabetic risk among non-diabetic workers of a tertiary care hospital. Int J Community Med Public Health 2018;5:3592-5.
11. Vidya GS, Sandesh TR, Kaur N. A Study on Assessment of Risk of Type 2 Diabetes Mellitus among Bank Employees Using Indian Diabetic Risk Score. Natl J Community Med. 2016;7(12):936-9.
12. Singh MM, Mangla V, Pangtey R, Garg S. Risk Assessment of Diabetes Using the Indian Diabetes Risk Score: A Study on Young Medical Students from Northern India. Indian J Endocrinol Metab. 2019 Jan-Feb;23(1):86-90.
13. Ranadip C, Abhijit M, Saibendu KL. A study on distribution and determinants of Indian Diabetic Risk Score (idrs) among the rural population of West Bengal. Natl J Med Res. 2012;2(3):282-6.
14. Brinda P, Santosh A. A study to determine the hidden part of the iceberg of diabetes using Indian diabetes risk score as a screening tool in rural population of Bangalore, Karnataka, India. Int J Community Med Public Health. 2016;3(11):3076-80.