



“Knowledge and Risk Factors regarding Prediabetes among Adults Residing in Kerala”

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Abstract: Prediabetes is a high-risk intermediate state that can progress to type 2 diabetes if left undetected and unmanaged. This non-experimental descriptive study aimed to assess the knowledge and risk factors associated with prediabetes prevalence among parents and staff of a selected nursing college in Kerala. A total of 227 adults were screened using fasting blood sugar (FBS) levels, and 101 prediabetic individuals were selected through purposive sampling. Data were collected using a sociodemographic proforma, a structured knowledge questionnaire, and a risk factor checklist, and analyzed with descriptive and inferential statistics. Among those screened, 44% were prediabetic, 5% were diabetic, and 51% had normal FBS. Within the prediabetic group, 22.7% had good knowledge, 68.3% had average knowledge, and 4% had poor knowledge regarding prediabetes. Significant associations ($p < 0.05$) were found between gender and lifestyle risk factors such as smoking, alcoholism, and gestational diabetes mellitus, and between BMI and conditions like high cholesterol and arthritis. The findings suggest that demographic factors influence prediabetes risk profiles, and highlight the need for improved awareness and preventive strategies to enable early detection and reduce progression to diabetes.

Keywords: Prevalence, knowledge, risk factors, prediabetes, fasting blood sugar..

INTRODUCTION

Prediabetes is a state of impaired glucose tolerance that confers a high risk of progression to type 2 diabetes mellitus (T2DM)¹. Globally, the prevalence of prediabetes and diabetes is increasing rapidly, largely attributed to the rising burden of obesity, sedentary lifestyles, and unhealthy dietary patterns². Despite being a reversible condition, prediabetes often remains undiagnosed and under-recognized in the community due to limited public awareness³. If left unmanaged, individuals with prediabetes have a five to six-fold higher risk of developing T2DM⁴.

BACKGROUND

Existing literature emphasizes the growing burden of prediabetes and its associated risk factors. Prediabetes has been identified as a critical high-risk state preceding the onset of clinical diabetes¹. The ICMR-INDIAB national cross-sectional study highlighted the substantial burden of prediabetes across India, emphasizing it as a key component of the country's metabolic non-communicable disease epidemic³. Regional data from Tamil Nadu indicate a higher prevalence among females aged above 40 years, with

family history and physical inactivity emerging as predominant risk factors⁴. Studies in urban populations further correlate high prediabetes prevalence with sedentary behavior and dietary transitions¹⁰. Collectively, these findings demonstrate a strong association between sociodemographic and lifestyle factors and prediabetes risk. However, limited data are available on the level of knowledge and specific risk profiles among parents and staff of nursing colleges in Kerala, which forms the rationale for the present study.

In India, prediabetes represents a significant public health challenge, with an estimated prevalence of nearly one in six adults in 2021⁵. The state of Kerala, despite high literacy rates and accessible healthcare, reports a prediabetes prevalence of 18.1%⁶. It is estimated that 5% to 10% of individuals with prediabetes progress to diabetes annually, and approximately 70% will develop diabetes in their lifetime⁷. Given this rapid progression and the high regional burden, there is an urgent need to assess the knowledge and risk factors associated with prediabetes among adults in Kerala to facilitate early detection and preventive interventions.



OBJECTIVES

1. To determine the prevalence of prediabetes among adults residing in Kerala.
2. To assess the level of knowledge regarding prediabetes among adults residing in Kerala.
3. To identify the risk factors associated with prediabetes among adults residing in Kerala.
4. To find out the association between knowledge regarding prediabetes and selected demographic variables among adults residing in Kerala.
5. To find out the association between prediabetes risk factors and selected demographic variables among adults residing in Kerala.

HYPOTHESES

H₁: There is a statistically significant association between the level of knowledge regarding prediabetes and selected demographic variables among adults residing in Kerala.

H₂: There is a statistically significant association between the risk factors for prediabetes and selected demographic variables among adults residing in Kerala.

METHODOLOGY

Research Approach

The study adopted a quantitative research approach to gather measurable, numerical data regarding prediabetes.

Research Design

A non-experimental descriptive survey design was utilized for the present study.

Setting

The study was conducted at a selected nursing college in Kerala.

Population

The target population comprised adults aged 35–55 years residing in Kerala who were at a potential risk of developing diabetes. This specifically included staff members and parents of students enrolled in the selected institution.

Sample

The final sample consisted of 101 adults who met the pre-established eligibility criteria.

Sampling Technique

A purposive sampling technique was employed to select the participants based on the following criteria:

- Inclusion Criteria: Adults aged 35–55 years who were willing to participate in the study.

- Exclusion Criteria: Individuals with a previously diagnosed history of diabetes mellitus.

Tool Description

Data collection was carried out using three distinct instruments:

- Tool I : Structured Sociodemographic Proforma: Designed to gather comprehensive information on the participants' demographic characteristics.
- Tool II : Structured Knowledge Questionnaire: An 18-item questionnaire developed to assess the participants' baseline knowledge regarding prediabetes.
- Tool III : Risk Factor Checklist: A 13-item checklist used to identify the presence of specific risk factors associated with prediabetes among the sample.

Validity

The content validity of all three instruments was established through expert evaluation by a panel of specialists in nursing and related health disciplines to ensure accuracy, clarity, and relevance.

Reliability

The reliability of the instruments was determined through specific testing methods, complemented by a preliminary pilot study to ensure overall feasibility and practicability:

- Knowledge Questionnaire (Tool II): Determined using the split-half method, yielding a reliability coefficient of 0.91, indicating excellent internal consistency.
- Risk Factor Checklist (Tool III): Assessed using the test–retest method, resulting in a reliability coefficient of 0.67, indicating acceptable stability.

Ethical Clearance

Official ethical clearance was obtained from the Institutional Ethics Committee, and formal administrative permission was secured from the concerned authorities prior to data collection. Written informed consent was obtained from all participants after a thorough explanation of the study's purpose. Complete confidentiality and anonymity of the participants were strictly maintained throughout. Following data collection, the compiled data were analyzed using descriptive and inferential statistics, with statistical significance set at $p < 0.05$.

RESULTS

Section A: Prevalence of prediabetes among adults

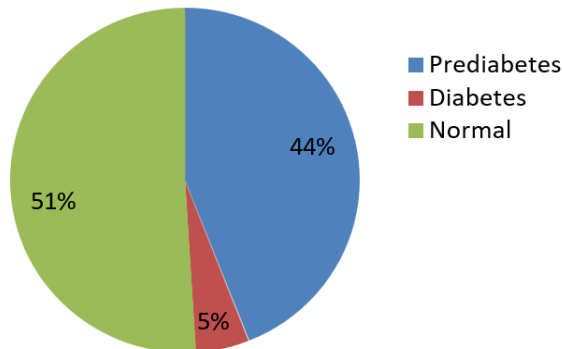


Figure 1: Percentage distribution of prediabetes among adults.

Out of the 227-study population screened, 51% had normal glycemic status, 44% had prediabetes, and 5% had diabetes. (Figure 1)

Section B: Sociodemographic Characteristics

Among the 101-prediabetic sample, 64.4% were females and 35.6% were males. The age distribution showed a majority (38.6%) in the 51–55 years category. Most (90.1%) were non-vegetarians. Educationally, 38.6% completed high school and 37.6% higher secondary education. Regarding occupation, 35.6% were self-employed. Only 44.5% had prior knowledge about prediabetes, largely from social media. Geographically, 52% resided in Ernakulam. BMI assessment revealed 55.4% were overweight and 35.6% had a normal BMI.

Section C: Level of knowledge regarding prediabetes among adults

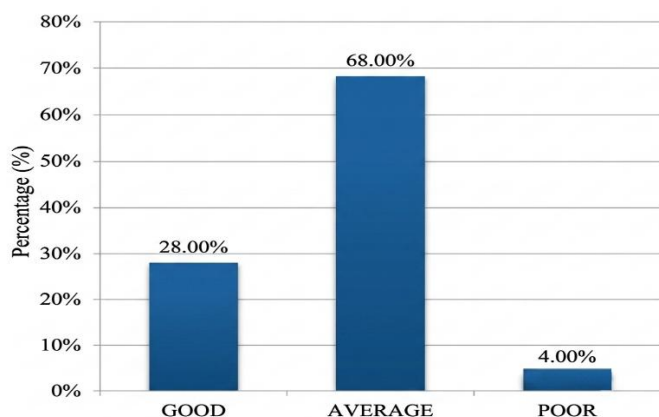


Figure 2: Percentage distribution of adults based on level of knowledge

A majority (68.3%) of adults possessed an average level of knowledge regarding prediabetes, 27.7% demonstrated a good level of knowledge. Only 4% had poor level of knowledge. Over all the study suggests that adults residing in Kerala have an average understanding of prediabetes. (Figure 2)

Section D: Risk Factors of prediabetes among adults

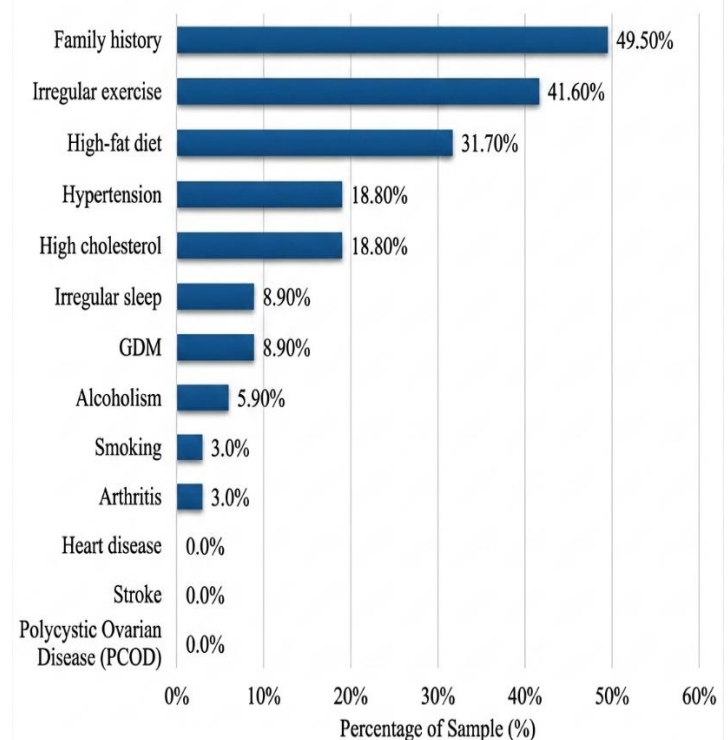


Figure 3 : Percentage distribution of riskfactors among adults.

The top three risk factors identified were a family history of diabetes (49.5%), irregular exercise (41.6%), and a high-fat diet (31.7%). Other factors included hypertension and high cholesterol (18.8% each), irregular sleep and GDM (8.9% each), alcoholism (5.9%), and smoking and arthritis (3% each). (Figure 3)

Section E: Association between level of knowledge and socio-demographic variables

Table 1: Association between level of knowledge with selected socio-demographic variables.



Variables	Characteristics	Level of knowledge			df	X ²	Critical value
		Good	Average	Poor			
Age	35 - 40	05	09	00	06	2.38	12.59
	41-45	07	21	02			
	46-50	04	13	01			
	51-55	12	26	01			
Gender	Male	11	23	02	02	0.682	5.99
	Female	17	46	02			
District	Alappuzha	01	02	01	18	24.25	28.86
	Ernakulam	14	38	01			
	Idukki	06	14	00			
	Kannur	00	02	01			
	Kollam	03	03	00			
	Kottayam	00	02	00			
	Kozhikode	00	01	00			
	Palakkad	00	02	00			
	Thrissur	02	05	01			
	Trivandrum	02	00	00			
BMI	Under weight	01	01	00	08	5.59	15.507
	Normal	11	24	01			
	Overweight	16	38	02			
	Obese	00	05	01			
	Morbidly obese	00	01	00			
Food habits	Non veg	25	62	04	02	0.481	5.991
	Veg	03	07	00			

p-value <0.05

The analysis revealed no statistically significant association between the level of knowledge regarding prediabetes and the selected demographic variables. The calculated Chi-square values were not significant at the 0.05 level of significant ($p > 0.05$), indicating that the observed differences in knowledge scores across demographic categories were not statistically meaningful. Therefore, the research hypothesis (H_1) was rejected.

Section F: Association between risk factors of prediabetes with selected demographic variable (BMI)

Analysis of BMI under risk factor showed varied associations. No statistically significant associations were found for family history ($\chi^2 = 9.01$, $p < 0.05$), irregular exercise ($\chi^2 = 1.11$, $p < 0.05$), high-fat diet ($\chi^2 = 5.35$, $p < 0.05$), smoking ($\chi^2 = 0.35$, $p < 0.05$), and alcoholism ($\chi^2 = 0.7$, $p < 0.05$). All these χ^2 values were below the critical value of 9.49 so the research hypothesis H_2 was rejected for these variables. In contrast, significant associations were found for high cholesterol ($\chi^2 = 9.77$, $p < 0.05$) and arthritis ($\chi^2 = 20.66$, $p < 0.05$), as



both exceed the critical value. Therefore, the research hypothesis H_2 was accepted for high cholesterol and arthritis.

Section G: Association between risk factors of prediabetes with selected demographic variable (Gender)

Significant associations were found between gender and smoking ($\chi^2=5.62$, $p<0.05$), alcoholism ($\chi^2=11.50$, $p<0.05$) and GDM ($\chi^2=5.36$, $p<0.05$). All calculated χ^2 values exceeded the critical value of 3.841. Males had higher frequencies of smoking and alcoholism. Females had a higher frequency of GDM. Therefore, research hypothesis H_2 was accepted.

DISCUSSION

The present study found that among 227 participants, 44.0% were identified as having prediabetes, 5.0% as diabetes, and 51.0% had normal blood glucose levels. These findings indicate a substantial burden of prediabetes in the study population. In comparison, a previous study among 368 participants reported a lower prevalence of prediabetes (18.8%) and diabetes (3.7%), while the majorities (77.4%) were non-diabetic. The higher prevalence observed in the present study may be attributed to differences in demographic characteristics, lifestyle factors, and study settings.⁸ Regarding knowledge of prediabetes, the majority of participants (68.3%) demonstrated an average level of knowledge, while 27.7% had good knowledge and only 4.0% had poor knowledge. In contrast, a study conducted in Saudi Arabia reported that 87.1% of respondents possessed a high level of knowledge regarding prediabetes. The comparatively lower knowledge levels observed in the present study highlight the need for enhanced health education and awareness programs to improve public understanding of prediabetes and its prevention⁹.

With respect to risk factors, family history of diabetes (49.5%) emerged as the most common risk factor, followed by irregular physical activity (41.6%), high-fat diet (31.8%), and hypertension/high cholesterol (18.8%). Similar findings have been reported in previous studies, where family history of diabetes (52.3%) and physical inactivity (29.7%) were identified as major risk factors. These findings emphasize the combined influence of genetic predisposition and modifiable lifestyle factors on the development of prediabetes. Therefore, community-based screening, lifestyle modification programs, and targeted health education are essential to reduce the risk of progression from prediabetes to type 2 diabetes mellitus.

NURSING IMPLICATIONS

The study highlights the vital role of nurses in identifying individuals at risk for prediabetes through early screening and assessment. Nurses can promote awareness regarding risk factors, healthy

lifestyle practices, and preventive measures through health education and counseling, thereby contributing to the prevention of diabetes and improvement of community health outcomes.

RECOMMENDATIONS

Regular community-based screening programs should be conducted to identify individuals at risk for prediabetes. Health education initiatives focusing on lifestyle modification, healthy dietary practices, physical activity, and weight management should be strengthened. Further research with larger samples and diverse populations is recommended to enhance the generalizability of findings.

LIMITATIONS

The sample size was relatively small, which may limit the external validity of the findings. Data regarding risk factors and lifestyle practices were self-reported and may be subject to recall bias. Knowledge was assessed at a single point in time and may not reflect long-term awareness or behavioral changes.

CONCLUSION

The study revealed a high prevalence of pre diabetes among adults residing in Kerala with 44.0% of participants identified as pre diabetic. Most participants demonstrated an average level of knowledge regarding pre diabetes, indicating the need for continued awareness and the educational interventions. Family history of diabetes irregular physical activity and high-fat dietary habits were the most common risk factors identified. Significant associations were observed between BMI and high cholesterol and arthritis. Gender was significantly associated with the smoking and alcohol consumption, which were prevalent among males, while gestational diabetes mellitus emerged as an important risk factor among females. These findings highlight the importance of targeted screening, lifestyle modification and preventive health strategies to reduce the burden of diabetes.

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Conflict of Interest

The author declares that there is **no conflict of interest** related to this study.

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