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EXPLORING KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING DIABETES MELLITUS AMONG THE GENERAL POPULATION: A CROSS-SECTIONAL INVESTIGATION.

Adnan Imam[1], Prashant Dharepgol[2]*
[1]Assistant Professor, Department of General Medicine, Narayan Medical College & Hospital, Jamuhar, Bihar, India.
[2]Associate Professor, Department of General Medicine, Faculty of Medicine KBN University, Kalaburagi, Karnataka, India.

ABSTRACT.

Background: Diabetes type 2 (T2DM) is a global pandemic that causes severe disability and early death. This study examined general population diabetes knowledge, attitude, and practice (KAP). This knowledge helps develop and implement diabetes prevention strategies.

Methods: A cross-sectional investigation was conducted at KBN University, Kalaburagi, Karnataka, India. Participants in this trial were previously healthy, literate people who had not attended a diabetes education program in the previous two years.

Results: The study comprised 277 individuals in total. The majority (77%) knew about diabetes mellitus either moderately (39%) or more than moderately (38%). Age and gender did not significantly correlate with knowledge, even though education level was positively and strongly associated with knowledge ($p = 0.001$). In contrast to knowledge, the majority of people (90%) had a negative attitude regarding diabetes, and education level had no discernible impact on this attitude. In terms of behaviors, over half of the participants never had their blood sugar checked, over 65% used to consume huge amounts of refined sugar, and 80% did not regularly exercise.

Conclusion: The majority (77%) had knowledge of diabetes that was either moderate or above moderate, but 88% of them had negative views regarding the disease. More than half of the research participants did not engage in any preventive steps, suggesting that increased awareness about diabetes did not convert into healthy habits. As a result, the general public's negative attitudes and behaviors around diabetes mellitus in India need to be addressed with greater emphasis.

Recommendations: Since most participants knew about diabetes but disliked it, tailor education. To close the general population's knowledge-health behavior gap, encourage regular blood sugar readings and sugar reduction. Promote proactive, constructive diabetes management by improving awareness of its importance and effects.

Keywords: Diabetes mellitus, Attitude, Knowledge, Practice
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Corresponding author: Prashant Dharepgol[*]
Email: drprashantedd@gmail.com
Associate Professor, Department of General Medicine, Faculty of Medicine KBN University, Kalaburagi, Karnataka, India.

INTRODUCTION.

Type 2 diabetes mellitus (DM) has emerged as a pervasive global epidemic, characterized by a multitude of adverse consequences, including substantial disability, premature mortality, and significant healthcare expenditures. The projected trajectory of the global diabetic population indicates a twofold rise between the years 2000 and 2030, with a notable surge anticipated in the Asian region [1]. Within the Asian regions, it is evident that South Asia is assuming prominence as the central locus of this burgeoning epidemic. This phenomenon can be attributed to the swift demographic transitions and the adoption of deleterious dietary and lifestyle practices [2]. The South Asian population exhibits an increased susceptibility to the onset of DM at an earlier age and with a lower body mass index in comparison to other ethnic cohorts. As a result, there has been a significant increase in the prevalence of diabetes mellitus (DM) in the South Asian region. This surge has exerted considerable pressure on the healthcare infrastructure of these nations, many of which are inadequately equipped to handle the associated demands.
The successful management of DM relies heavily on timely identification and the provision of suitable interventions to alleviate the accompanying health complications. The principal objective of DM management is to prolong the initiation of macrovascular and microvascular

complications through the attainment of optimal glycemic control. This encompasses lifestyle modifications, including regular physical activity, adherence to a well-balanced dietary regimen, effective weight management strategies, and the implementation of pharmaceutical interventions as deemed necessary. Therefore, health literacy assumes a crucial role in the management of diabetes. Individuals possessing a profound comprehension of diabetes and its associated complications exhibit a heightened propensity to actively pursue suitable therapeutic interventions, assume responsibility for their overall well-being, and engage in judicious decision-making about their healthcare. There exists substantial evidence suggesting that the implementation of comprehensive knowledge and diligent self-care practices in the management of diabetes yields superior and prolonged glycemic control. Moreover, previous investigations centered on knowledge, attitudes, and practices (KAP) about diabetes have underscored the necessity for increased consciousness concerning the prevention, diagnosis, and management of risk factors associated with diabetes [3].

Notwithstanding the potential advantages associated with enhanced knowledge, attitudes, and practices about the management of diabetes, there exists a dearth of information concerning the present condition of knowledge, attitudes, and practices (KAP) about diabetes among the general populace in India. The present study was conducted to evaluate the knowledge, attitudes, and practices about diabetes among a representative sample of the general population in India.

METHODS.

Study Design.

A cross-sectional study was conducted.

Study setting.

This study was conducted from January to December 2022 at KBN University, Kalaburagi, Karnataka, India.

Participants.

A sum of 167 individuals participated in the study.

Inclusion criteria.

The present study aimed to investigate a cohort of individuals aged 18 years and above, who were previously deemed to be in good health, encompassing individuals of both male and female genders.

Exclusion criteria.

Individuals below the age of 18, those with cognitive impairments, individuals lacking proficiency in reading or writing in Hindi or English languages, those who had previously engaged in a diabetes education program within the preceding two years, and individuals who expressed unwillingness to partake in the study were excluded.

Ethical considerations.

Ethical approval for this study was obtained from the ethical review committee. Informed written consent was obtained from all individuals before data collection. Participants were informed of their rights to withdraw from the study at any stage.

Study Procedure.

The study utilized cluster sampling methodology to ascertain the households included in the research. A total of 18 clusters were selected for analysis, employing a criterion based on population density maps of the three designated regions. Within each cluster, a random selection was made, consisting of approximately 10 households. The aforementioned selection process encompassed the identification of a randomized locale utilizing the comprehensive voters' list specific to the designated region. Subsequently, eligible households were selected within said locale, in strict adherence to the EPI Methodology prescribed by the esteemed World Health Organization. A single representative from each domicile was extended an invitation to partake in the investigation, culminating in a collective sum of 167 participants who were previously in a state of sound health.

Development of KAP Questionnaire and Data Collection.

A diabetes-focused questionnaire was developed to gather insights into individuals' knowledge, perceptions, and behaviors about this medical condition. After reviewing analogous questionnaires utilized in various settings, the instrument was modified to suit the study population, taking into account their unique lifestyle, cultural background, and additional pertinent factors. The questionnaire underwent a comprehensive evaluation and validation process by diabetes specialists to ensure its clarity and accuracy.

The initial section of the questionnaire elicited personal demographic data, encompassing variables such as age, gender, educational attainment, occupational status, and income level. Subsequently, a set of ten inquiries was administered to assess the level of knowledge individuals possessed about diabetes, encompassing aspects such as its impact on glycemic levels and the diagnostic procedures employed for its identification. Inquired were six queries about the participants' perspectives on the management of diabetes, encompassing the comparative efficacy of dietary interventions vis-à-vis pharmacological interventions. Subsequently, a series of inquiries were posed about their

professional routines, encompassing measures undertaken to mitigate the risk of diabetes and self-care practices.

Statistical Analysis.

Descriptive statistics were employed to present the socio-demographic attributes of the participants, encompassing age, gender, and educational attainment. The statistical analysis was performed utilizing SPSS software (version 11, SPSS Inc.).

RESULT.

Among the entire cohort of 167 participants, it was observed that 57.5% of them identified as females. Furthermore, the average age of the participants was determined to be 40 years. The majority of individuals exhibited a favorable educational background, with approximately 54% having pursued studies up to the advanced level (A/L). Conversely, a mere 3% possessed an educational attainment limited to grade 5. Remarkably, an overwhelming majority of the study participants, approximately 96%, exhibited prior knowledge regarding the existence of diabetes.

Table 1: Socio-demographic characteristics of the study participants.

Variable		Percentage %
Age	18–34	39.8
	35–64	55.3
	Above or equal to 65	2.8
Gender	Male	40.5
	Female	57.5
Level of education	Up to grade 5	3
	Up to O/L	16.7
	Up to A/L	54.6
	Graduate	23.5
Employment status	Working fulltime	33.2
	Working part-time	8.0
	Unemployed	26.4
	Housewife	14.1
	Retired	0.6
	Others	12.3

Knowledge Assessment.

The knowledge was assessed using ten questions about diabetes diagnosis, risk factors, prevention, and complications. On average, participants scored 15.5 out of 25 points. 36% had excellent knowledge (scored 18 or higher), while 22% had poor knowledge (scored below 15). 38% had moderate knowledge (scored 13 to 17). 86% knew that diabetes involves high blood glucose levels. 47% correctly identified the pancreas as the affected organ, 17% thought it was the liver, and 21% didn't know. 84% were aware of diabetes complications in various organs, but 55% were unaware of its impact on cerebral function, especially among those under 34. 82% knew about diabetes prevention. Most participants correctly answered questions about diabetes risk factors, such as obesity (76%), lack of physical activity (83%), family history (72%), and sugar consumption (91%).

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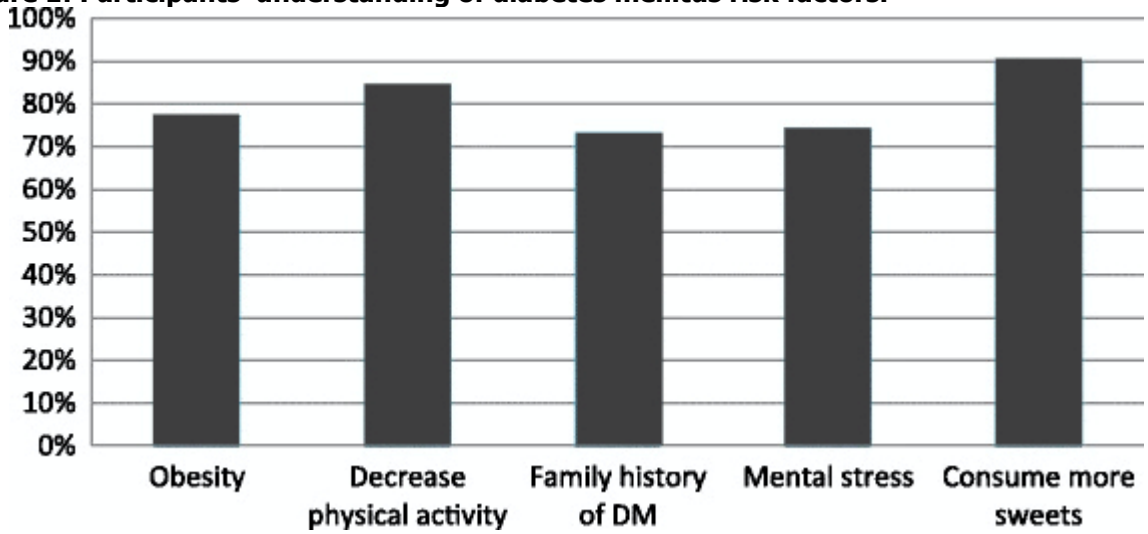
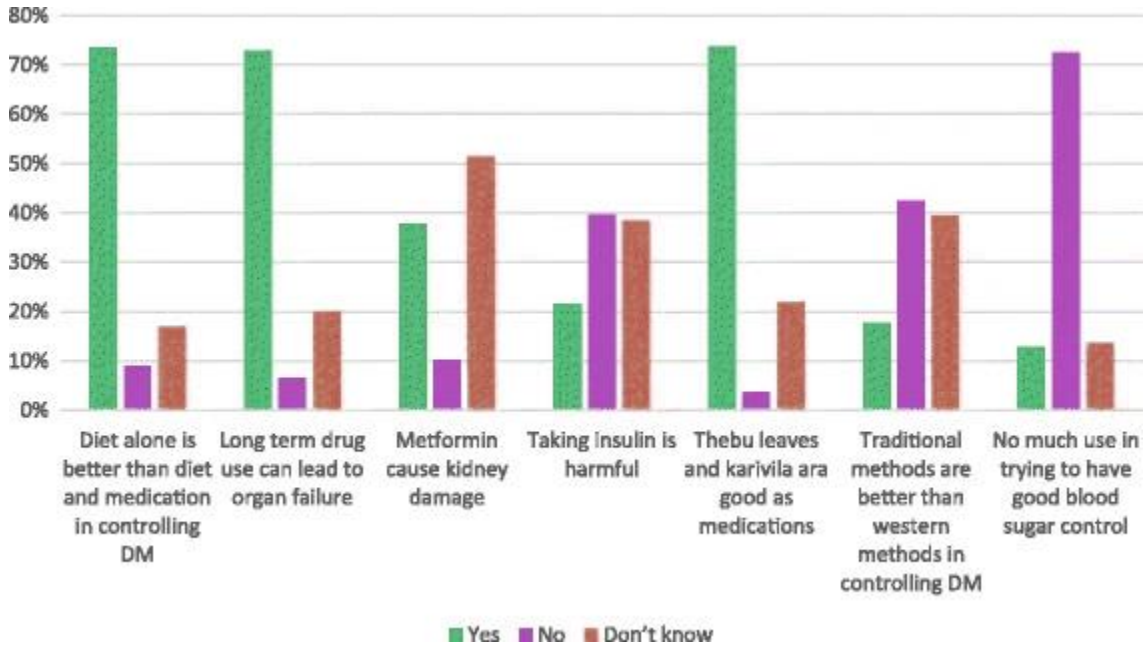
Figure 1: Participants' understanding of diabetes mellitus risk factors.



Attitudes Assessment.

Attitudes using six questions were assessed. 87% had suboptimal attitudes towards diabetes. 72% believed prolonged medication use for diabetes could lead to organ dysfunction. 37% of those who knew about metformin thought it could cause kidney problems. 72% believed in the effectiveness of alternative medicine like Thebu leaves. 21% were concerned about the adverse effects of daily insulin injections (Figure 2). 17% believed alternative therapies (acupuncture, bali-thovil, herbal remedies) were better than conventional methods. Education level, knowledge, gender, and socio-economic status did not significantly affect attitudes.

Figure 2: Individual responses to seven questions on attitudes.



Practices Assessment.

Practices related to medical intervention, screening, dietary adherence, and physical exercise were assessed. 91%

intended to seek medical help if they or their relatives were diagnosed with diabetes. Over 50% didn't monitor their blood glucose levels. Only around 32% followed recommended diabetes management guidelines, including regular screenings. About 64% consumed refined sugar liberally. A majority (78%) didn't engage in regular physical exercise.

DISCUSSION.

This study elucidates several salient observations such as the majority of participants exhibited a moderate to satisfactory level of knowledge regarding diabetes. The relationship between knowledge and gender or age did not yield statistically significant results. However, a significant association was observed between knowledge and education level ($p = 0.001$). Despite possessing adequate knowledge, approximately 88% of individuals exhibited a suboptimal attitude towards diabetes. The majority of participants exhibited a strong inclination towards actively pursuing medical intervention in the event of diabetes manifestation in either themselves or their immediate family members. A considerable proportion of participants exhibited a lack of active involvement in preventive measures for diabetes.

In contrast to analogous investigations conducted in developing nations, the present study distinguishes itself by demonstrating comparatively enhanced knowledge levels, as evidenced by a substantial majority of participants (76% or more) exhibiting a moderate to good level of knowledge [4, 5]. The observed phenomenon could potentially be ascribed to the comparatively elevated levels of literacy in India, as well as the presence of firmly established social and media networks within the country.

This study yielded intriguing results, as it revealed the absence of noteworthy disparities in knowledge based on gender or age. This finding stands in contrast to previous research conducted in developing nations, which often indicates that males exhibit superior knowledge levels. Nevertheless, akin to numerous other investigations, this particular study unveiled a noteworthy correlation between the level of education attained and the extent of knowledge acquired [6, 7, 8].

The salient observation pertains to the disparity existing between knowledge and attitudes [4, 7, 8]. Despite possessing adequate knowledge, approximately 87% of individuals exhibited a suboptimal attitude toward the management of diabetes. The observed disparity could potentially be attributed to suboptimal and inadequately synchronized health education endeavors in India, thereby fostering misconceptions within the populace. In a notable proportion of individuals, there existed a belief that the prolonged utilization of pharmaceutical agents such as metformin may potentially result in adverse effects on bodily organs. Additionally, a considerable number of individuals held the perspective that botanical remedies, such as Thebu leaves, possessed superior efficacy compared to conventional pharmaceutical interventions [9]. The influence of these beliefs on diabetes management is evident in the concurrent utilization of herbal medicine in conjunction with prescribed pharmacotherapy.

Furthermore, a significant proportion of individuals held the belief that metformin is associated with renal impairment (36.8%) and the administration of insulin carries potential harm (20.5%), both of which have the potential to adversely impact the management of diabetes. This underscores the imperative for enhanced understanding and pioneering pedagogical frameworks to transform societal perspectives. The acquisition of knowledge in isolation may not yield favorable modifications in behavior, as evidenced by prior investigations wherein subjects persisted in the consumption of sugary food items despite being cognizant of the associated hazards [10].

There exists a notable disparity between the acquisition of knowledge and the implementation of preventive measures, as a considerable proportion of the populace, exceeding fifty percent, fails to partake in actions aimed at averting the onset of diabetes. These measures encompass the limitation of refined sugar intake, which is neglected by approximately sixty-four percent of individuals, as well as the engagement in regular physical exercise, which is disregarded by approximately eighty-one percent of individuals. Furthermore, the regular monitoring of blood sugar levels, a crucial aspect of diabetes prevention, is neglected by approximately fifty-seven percent of individuals. Additional investigation is warranted to ascertain the level of understanding, attitudes, and behaviors exhibited by individuals afflicted with diabetes, with the ultimate goal of formulating efficacious interventions.

CONCLUSION.

The study's most notable discovery pertained to the disparity observed between individuals' knowledge and attitudes regarding diabetes and its management. Even though the majority of individuals possessed knowledge above the average level, this did not manifest in their attitudes towards DM. Hence, this study may serve as a fundamental reference for national initiatives about diabetes awareness campaigns, enabling the adjustment of educational strategies to prioritize the cultivation of a transformative attitude towards diabetes.

LIMITATIONS.

This study recruited household members by open invitation, which may introduce a health-seeking bias by accidentally including more health-conscious persons. Thus, the results may not reflect the public. However, this suggests that fewer health-conscious persons may have even lower diabetes knowledge, attitudes, and practices than this study found. The study didn't ask for health information sources either.

RECOMMENDATIONS.

Incorporate educational initiatives that are specifically tailored to individuals exhibiting a pessimistic disposition towards diabetes, given that a significant proportion of participants possessed adequate knowledge but harbored unfavorable perspectives. The implementation of health promotion initiatives aimed at fostering healthier lifestyles, including the regular monitoring of blood sugar levels and the reduction of sugar intake, is crucial in addressing the disparity between individuals' knowledge and their adoption of healthy behaviors within the wider populace. Enhance the dissemination of knowledge regarding the gravity of diabetes and its associated ramifications, with a particular emphasis on advocating for a constructive and proactive stance in the management of this condition.

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LIST OF ABBREVIATIONS.

T2 DM: type 2 Diabetes mellitus
KAP: Knowledge, attitude, and practice
MOH: Medical Officer of Health

SOURCE OF FUNDING.

The study had no funding

CONFLICT OF INTEREST.

The authors report no conflicts of interest in this work.

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