

Original Research Article

Assessment of functional, communicative, and critical health literacy in diabetes management among patients attending a tertiary care centre in Maharashtra, India

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ABSTRACT

Background: Effective diabetes management significantly relies on health literacy; however, within the Indian context, its components-communicative, functional, and critical health literacy-are inadequately comprehended. This research aimed to assess the factors related to diabetes treatment for patients enrolled in a tertiary care facility in Maharashtra, India.

Methods: Total 201 people under 75 with type two diabetes participated in cross-sectional research. Communicative, Functional, as well as Critical Health Literacy (FCCHL) scale has been employed to evaluate health literacy. Data on sociodemographic factors, diabetes control (last fasting blood sugar values), and health literacy domains were collected and analysed using chi-square tests, odds ratios, and ANOVA.

Results: Average participant age was 56.33 yrs (± 10.879). Health literacy was higher among men (60.1 percent) than among women (45.1%; p value=0.033). Both functional as well as communicative health literacy didn't exhibit substantial affiliation with diabetes control; however, critical health literacy did (p equal to 0.008). Health literacy as well as education level were substantially correlated ($p=0.043$), with graduates showing higher literacy. Health literacy did not significantly correlate with occupation, family type, or place of residence.

Conclusions: Better diabetes control is strongly correlated with critical health literacy, underscoring the significance of enabling patients to evaluate and apply medical information critically. To improve diabetes management outcomes, interventions should concentrate on enhancing functional and communicative health literacy, especially among females and populations with decreased levels of education.

Keywords: Diabetes, Health literacy, Maharashtra

INTRODUCTION

Diabetes mellitus has emerged as a major public health concern in India, with a rapidly increasing prevalence and significant disease burden across both urban and rural populations.¹ Type 2 diabetes is associated with serious long-term complications, poor quality of life, and increased mortality.² Effective management of diabetes depends not only on clinical interventions but also on the

patient's ability to understand, process, and act upon health-related information.³ This capacity is encapsulated in the concept of health literacy, which is increasingly recognized as a critical determinant of health outcomes.⁴

Health literacy can be categorized into three domains: functional (basic reading and comprehension skills needed to function effectively in everyday health situations), communicative (advanced cognitive and

social skills to extract meaning from and apply information), and critical health literacy (the ability to critically analyse and use information for informed decision-making).⁵ Together, these components form the foundation for effective self-management of chronic conditions such as diabetes, which require daily decision-making and adherence to complex treatment regimens.⁶

Low health literacy has been consistently linked to poor glycaemic control, increased rates of complications, and lower utilization of preventive healthcare services.⁷ However, most research in this domain originates from Western countries, and there remains a dearth of context-specific data from low- and middle-income settings like India.⁸ Cultural, educational, and systemic differences may influence how patients access and use health information, particularly in linguistically diverse and resource-constrained environments.⁹

Previous studies suggest that functional health literacy alone may not be sufficient to promote optimal diabetes outcomes, and that communicative and critical literacy may play a more decisive role in effective disease self-management.¹⁰ Moreover, health literacy is shaped by various social determinants, including education, gender, occupation, and socioeconomic status, which further complicates its impact on health outcomes.¹¹

Despite its growing importance, health literacy remains underexplored in the Indian healthcare context, particularly among individuals living with diabetes. This study aims to fill this gap by assessing the levels of functional, communicative, and critical health literacy among patients with type 2 diabetes attending a tertiary care centre in Maharashtra, India, and exploring their association with sociodemographic factors and diabetes control.¹²

METHODS

Study design and setting

Over 18 months (August 2022–February 2024), cross-sectional research was carried out at a Western Maharashtra tertiary care hospital.

Study population

The study involved 201 type 2 diabetes patients aged below 75 years attending the outpatient diabetes clinic. Patients with cognitive dysfunction or those unable to complete the questionnaire were excluded.

Data collection

FCCHL scale, which consists of 15 items in three domains-functional (6 items), communicative (5 items), and critical (4 items) was used to evaluate health literacy. A 4-point Likert scale was used to record responses. Additionally, sociodemographic information, family

history, duration of diabetes, and blood sugar levels from the most recent fast were gathered.

Statistical analysis

SPSS v26 was used to analyse the data. To evaluate relationships between independent variables and health literacy domains, descriptive statistics, chi-square tests, odds ratios, and ANOVA were employed. P values <0.05 were considered statistically significant.

RESULTS

Sociodemographic characteristics

The demographic and clinical characteristics of the study participants are summarized as follows:

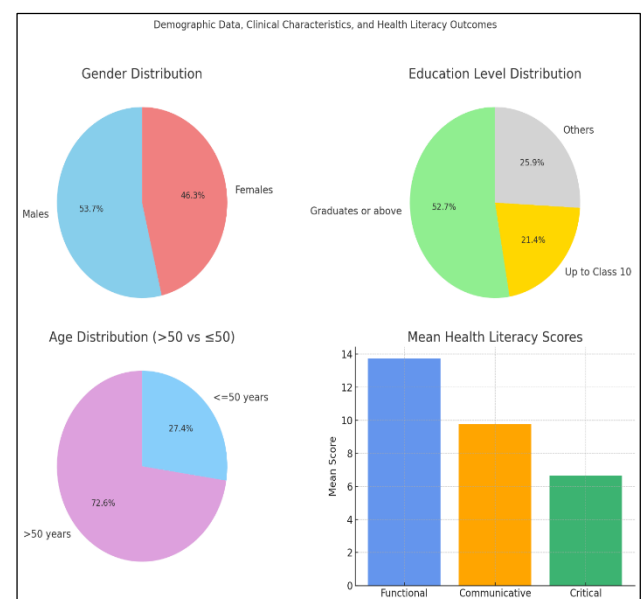


Figure 1: Demographic data, clinical characteristic, and health literacy outcomes.

The gender distribution of the participants showed that males comprised a slightly higher proportion (53.7%) compared to females (46.3%). In terms of educational attainment, over half of the participants (52.73%) were graduates or had higher qualifications, while 21.39% had completed education up to class 10, with the remaining participants falling into other educational categories.

Regarding age distribution, a significant majority (72.6%) of the participants were above 50 years of age, indicating that most individuals in the study belonged to the older adult population.

Analysis of health literacy domains revealed that participants had the highest mean score in functional health literacy (13.75), followed by communicative (9.75), and the lowest in critical health literacy (6.66),

suggesting a relative deficiency in the ability to critically evaluate and apply health information.

Table 1: Variable and association with health literacy/diabetes control.

Variable	Association with health literacy/diabetes control	Significance (p value)
Critical health literacy and diabetes control	Significant	0.008
Functional health literacy and diabetes control	Not significant	-
Communicative health literacy and diabetes control	Not significant	-
Gender and health literacy	Males had higher health literacy	0.033
Education level and health literacy	Significant association; higher in graduates	0.043
Place of residence and health literacy	No significant association	-
Family type and health literacy	No significant association	-
Occupation and health literacy	No significant association	-

DISCUSSION

The findings of this study reinforce the critical role of health literacy especially critical health literacy in diabetes management among patients in India. A significant association was observed between critical health literacy and diabetes control ($p=0.008$), highlighting the importance of decision-making and analytical capabilities in managing chronic conditions such as type 2 diabetes.¹³ These findings are consistent with global literature. For instance, Tang et al emphasized that higher health literacy, particularly critical literacy, was associated with improved glycaemic control in patients with type 2 diabetes.¹⁴ Similarly, Osborn et al and Lee et al found that patients with stronger decision-making and critical analysis skills were more successful in diabetes self-management and achieving glycaemic goals.^{15,16}

In contrast, no significant relationship was identified between functional or communicative health literacy and glycaemic control in our study. This contrasts somewhat with findings from Heijmans et al, who found that all three domains of health literacy functional, communicative, and critical were important for chronic disease self-management.¹⁷ The discrepancy could be due to contextual differences; our study population was drawn from a single center in India, where health systems, language barriers, or healthcare-seeking behaviors may influence the impact of various literacy types differently than in Western contexts. However, our findings align with those of Powell et al., who suggested that basic literacy alone may not suffice in producing positive health outcomes, especially if patients lack the ability to appraise and act upon the health information.¹⁸ This emphasizes that health literacy interventions must go beyond basic comprehension and incorporate critical thinking training.

Regarding sociodemographic factors, males in the present study exhibited significantly higher health literacy than females ($p=0.033$). This is in line with the findings of Hussain et al., who noted that Indian males typically have

better access to health education and healthcare services.¹⁹ The lower literacy among females reflects broader societal disparities and suggests that targeted gender-sensitive interventions are necessary.

Similarly, educational attainment was significantly associated with health literacy ($p=0.043$). Graduates and those with higher qualifications showed better literacy across domains, echoing findings from Berkman et al and Dagenais et al, both of which highlighted education as a consistent determinant of health literacy and diabetes outcomes.^{20,21}

Interestingly, no significant association was found between health literacy and factors like occupation, family type, or place of residence. This contrasts with findings from Van Der Heide et al and Vandenbosch et al, which emphasized the broader social determinants of health literacy, such as employment and family support systems.^{22,23} This disparity may suggest that in the specific Indian context, personal attributes like education level may play a more dominant role than social or environmental factors.

Another point of divergence from international research is the reliance in our study on fasting blood sugar (FBS) rather than HbA1c as a measure of diabetes control. While FBS offers a snapshot of glycaemic control, HbA1c provides a more reliable long-term measure. Studies such as Bains and Egede and Reusch and Manson emphasized the need to assess diabetes control through HbA1c for more accurate associations.^{24,25}

Finally, the absence of self-efficacy, social support, and healthcare access variables in our model is a limitation, as these have been shown in multiple studies to mediate the relationship between health literacy and glycaemic control.^{26,27}

This study has several limitations that should be acknowledged. First, its cross-sectional design restricts the ability to establish causal relationships between health literacy and diabetes control. Second, the study was

conducted at a single tertiary care hospital in Maharashtra, which may limit the generalizability of the findings to other geographic or healthcare settings. Third, health literacy was assessed using self-reported instruments, which are susceptible to recall bias and the tendency of participants to provide socially desirable responses. Fourth, the use of only fasting blood sugar levels to assess glycaemic control may not adequately reflect long-term management, as more comprehensive measures such as HbA1c would have provided a better overview. Fifth, the exclusion of patients with cognitive impairment may have omitted an important demographic known to struggle with health literacy and diabetes self-management. Sixth, despite careful administration of the FCCHL, regional dialects and varying literacy levels may have affected participants' comprehension and response accuracy. Lastly, key psychosocial factors such as access to healthcare, family support, mental health status, and patient motivation were not measured, although these could significantly influence both health literacy and diabetes outcomes.

CONCLUSION

Critical health literacy significantly influences diabetes self-management, highlighting the need for interventions that enhance patients' ability to interpret and use health information wisely. Reducing disparities in health literacy, particularly among women and individuals with lower educational attainment, is essential for improving diabetes outcomes in India.

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