The Association between Health Literacy and Health Promotion Behaviors for Clients with Type II Diabetes Mellitus at Kerbala \ Iraq

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ABSTRACT

Health literacy and health-promoting behaviors are two essential components in improving public health. They play a crucial role in preventing complications associated with Type 2 Diabetes Mellitus (T2DM) and reducing related healthcare costs. This correlational study involved 315 adult clients attending the Al-Hassan Diabetes and Endocrine Center in Karbala between December 25, 2024, and February 20, 2025. Participants were selected using a convenience sampling method. Data were collected using a structured questionnaire that included the Health Literacy Scale for adults and the Health-Promoting Lifestyle Profile. Data analysis was conducted using SPSS version 26, including descriptive statistics and Pearson's correlation coefficient. The mean score for health-promoting behaviors was 54.51 (SD = 15.83), and for health literacy was 129.57 (SD = 19.38), indicating a generally low level in both domains. A significant positive correlation was found between health literacy and health-promoting behaviors among clients with T2DM (r = 0.617, p = 0.001). This indicates that higher health literacy levels are associated with more frequent and effective health-promoting behaviors. The significant positive relationship between health literacy and health-promoting behaviors underscores the importance of educational interventions that focus on self-care and healthy lifestyle practices. Incorporating these elements into patient education and public health programs may enhance diabetes self-management, improve health outcomes, and prevent long-term complications.

Keywords: Health literacy, Health promotion behaviors, Type II diabetes mellitus

INTRODUCTION

Health literacy (HL) is defined as the ability to access, understand, and use health information and services to make informed health decisions[1]. It is recognized as a critical determinant of health outcomes, with low HL consistently linked to poor healthcare processes and results[2]. Inadequate HL is particularly associated with poor glycemic control in individuals with diabetes. Functional health literacy is essential for adhering to dietary guidelines, understanding medication instructions, and effectively managing the condition to reduce complications[3]. Promoting health and enhancing quality of life require both health-promoting behaviors and sufficient health knowledge. Improving HL has been shown to reduce healthcare costs and mitigate diabetes-related challenges[4]. Moreover, training healthcare providers—such as nurses—through educational programs, including the use of visual aids like posters, enhances their knowledge and empowers them to promote healthy behaviors within the community[5].

Numerous studies have validated the impact of health literacy and health-promoting behaviors on diabetes control and public health outcomes. It is estimated that over 80% of chronic diseases, including diabetes, can be managed or prevented through lifestyle modifications and the adoption of health-promoting practices[6].Diabetes affects multiple physiological systems and is increasingly associated with complications involving the liver, kidneys, and lipid profile. Timely intervention is essential to prevent the progression of these complications[7]. Health promotion incorporates both scientific and creative approaches to foster positive behavioral changes and improve overall well-being—physically, emotionally, socially, spiritually, and intellectually[8]. While diabetes exists in several forms, type 2 diabetes is the most prevalent. Identifying its contributing factors is crucial for developing effective preventive strategies and treatment plans[9]. Several studies have reported a strong correlation between health literacy and sociodemographic characteristics[10,11]. Therefore, diabetes education plays a vital role in improving metabolic control, preventing complications, and enhancing patients' quality of life[12].

Successful diabetes management requires active self-care and behavioral engagement[13]. Previous studies have shown that most individuals possess an average level of health awareness[14]. Furthermore, global estimates suggest that the number of individuals with type 2 diabetes may reach 552 million by the year 2030[15]. Although diabetes remains a chronic and incurable disease, it can be effectively managed through proper health literacy and the adoption of health-promoting behaviors, ultimately reducing medical expenses[16]. However, chronic illness and poor health have been cited as barriers to older women's participation in health-promotion programs[17]. Health-promoting behaviors encompass a wide range of factors, including interpersonal relationships, health responsibility, spiritual growth, stress management, nutrition, and physical activity[18]. Prior studies also emphasize the importance of educating patients on dietary management, recommending the provision of educational materials tailored to individuals with type 2 diabetes[19]. Health literacy is a foundational element in health education and promotion. It encompasses various skills—such as reading, listening, analyzing, and decision-making—and their application in health-related contexts. Importantly, these skills are not solely dependent on general literacy or educational level[20,21].

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Objective of the Study

1-To assess level of health literacy and health promotion behaviors for Clients with Type II Diabetes Mellitus.
2-To find out the relationship between level of health literacy and health promotion behaviors with their sociodemographic variables.

METHODOLOGY

Study Design: This is a correlational descriptive study conducted from December 25, 2024, to February 20, 2025, aiming to assess the relationship between health literacy and health-promoting behaviors in adults with Type 2 Diabetes Mellitus (DM II).

Setting: The study was conducted at the Al-Hassan Diabetes and Endocrine Center in Karbala, Iraq, chosen due to the high volume of diabetic patients seeking care at the center during the study period.

Sample: The sample comprised 315 adults with DM II, selected through Convenient non-probability sampling. The sample size was calculated using the formula:

= (z^2 × p × q) / d^2

Inclusion criteria were:

1. Confirmed diagnosis of Type 2 Diabetes Mellitus by a certified healthcare provider.
2. No mental or cognitive disorders.
3. Willingness to participate in the study.

Participants who failed to complete the questionnaire were excluded from the study, and sampling was repeated until the required sample size was achieved.

Instruments

Data were collected using a structured questionnaire comprising three sections:

1. Sociodemographic Information:
This section collected data on participants' marital status, age, gender, educational level, occupation, family history of Type 2 diabetes, disease duration, treatment history, complications, and sources of health information.

2. Health Literacy Scale for Adults (HELA):
The second section used the Health Literacy Scale for Adults (HELA), which measures five dimensions: reading and writing ability, understanding, decision-making, evaluation, and access to information.

3. Health-Promoting Lifestyle Profile (HPLP):
The third section used the Health-Promoting Lifestyle Profile (HPLP), which assesses eight dimensions: spiritual development, health responsibility, interpersonal relationships, physical activity, stress control, diet, foot care, and blood sugar control.

Data Collection: Data were collected through interviews conducted by trained researchers. After receiving approval from the center's administration, participants were informed about the study's purpose, and informed consent was obtained.

Reliability and Validity: The reliability and validity of the instruments were confirmed through a pilot study and expert review by a panel of 11 experts. The Cronbach's alpha for the instruments was 0.929, and the Content Validity Index (CVI) was 0.973.

Scoring System

The instruments used Likert scales for responses:
HELA Scale: The scale had 33 items, with responses scored as follows: 1 = Never, 2 = Sometimes, 3 = Always. The total score ranged from 33 to 99, with higher scores indicating better health literacy.

HPLP Scale: The scale had 65 items, with responses scored as follows: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always. The total score ranged from 65 to 260, with higher scores indicating better health-promoting behaviors.

Data Analysis: Data were analyzed using SPSS version 26. Descriptive statistics, including means and standard deviations (SD), were used to describe quantitative variables, while frequencies and percentages were used for categorical data. Pearson's correlation coefficient was used to assess the relationship between health literacy and health-promoting behaviors. Statistical significance was set at $p \leq 0.05$.

Ethical Considerations: Ethical approval was obtained from the Al-Hassan Diabetes and Endocrine Center's administration. Participants were informed of the study's objectives and assured of the

Table 1. Distribution of Clients according to their Socio-demographic Characteristics

List	Characteristics		f	%
1	**Age (year) M±SD= 55.8 ± 9.9**	20 – 29	2	.6
		30 – 39	12	3.8
		40 – 49	56	17.8
		50 – 59	123	39
		60 – 69	87	27.6
		70 +	35	11.1
		Total	***315***	***100***
2	**Sex**	Male	91	30
		Female	224	71
		Total	***315***	***100***
3	**Marital status**	Unmarried	6	1.9
		Married	274	87
		Separated	3	1
		Divorced	1	.3
		Widowed/er	31	9.8
		Total	***315***	***100***
4	**Occupation**	Housewife	206	65.4
		Employee	33	10.5
		Free works	23	7.3
		Retired	0	0
		Unemployed	53	16.8
		Total	***315***	***100***
5	**Level of education**	Doesn't read & write	102	32.4
		Read & write	31	9.8
		Primary school	101	32.1
		Intermediate school	35	11.1
		Secondary school	24	7.6
		Graduate	21	6.7
		Post graduate	1	.3
		Total	***315***	***100***
6	**Monthly income**	Enough	44	14
		Enough to some extent	257	81.6
		Not enough	14	4.4
		Total	***315***	***100***

f: Frequency, %: Percentage, M: Mean, SD: Standard deviation

confidentiality of their information. Informed consent was obtained from all participants, who were also informed of their right to withdraw from the study at any time without penalty.

RESULTS

In this study, the average age of the participants was55.8± 9.9 years; the highest percentage of 39% that seen with age group of "50 – 59 year". The sex of clients reveals that 71% of them are females while 30% are males that reflect females are dominant. In this study, the marital status refers that more most of clients are married (87%), 9.8% of them are widowed/widower, while only 1.9% are still unmarried. Among all Regarding occupations, 65.4% of clients are housewives, 16.8% of them are unemployed, and only 10.5% are working as governmental employee. The level of education refers that higher proportion of clients are "doesn't read and write" followed by "primary school graduate" among 32.1%. The monthly income indicates that 81.6% of clients perceive "enough to some extent" monthly income, while 14% perceive "enough" monthly income. The residency reveals that 57.1% of clients reside in urban and 42.9% of them reside in rural.

Table 2. Overall Assessment of Health Literacy for Clients with Diabetes Mellitus II

Overall Health Literacy	f	%	M	SD	Ass.
Low	141	44.8	**54.51**	**15.832**	**Low health literacy**
Moderate	125	39.7			
High	49	15.6			
Total	***315***	***100***			

f: Frequency, %: Percentage
M: Mean for total score, SD: Standard Deviation for total score, Ass: Assessment
Low= 33 – 55, Moderate= 55.1– 77, High= 77.1 – 99

Table (2) manifests that clients with diabetes mellitus II show low to moderate health literacy as reported among 44.8% with "Low" and 39.7% with "Moderate" with mean score (M±SD= 54.51 ± 15.832). While only 15.6% exhibited "High" level of health literacy.

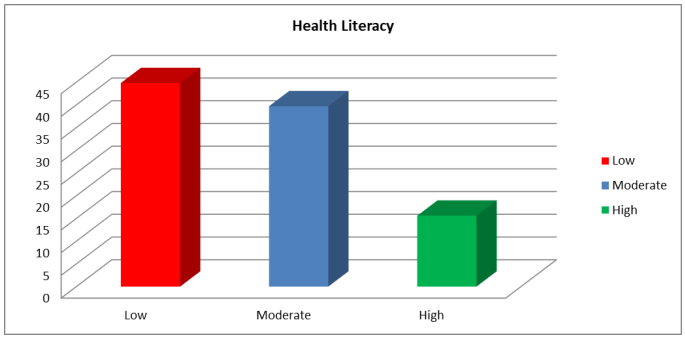

Table 3. Overall Assessment of Health Promotion Behaviors for Clients with Diabetes Mellitus II

Overall Behavior	f	%	M	SD	Ass.
Poor	193	61.3	129.57	19.383	Poor
Moderate	116	36.8			
Good	6	1.9			
Total	315	100			

f: Frequency, %: Percentage M: Mean for total score, SD: Standard Deviation for total score, Ass: Assessment, Poor= 65 – 130, Moderate= 130.1– 195, Good= 195.1 – 260.

Table(3) show that clients with diabetes mellitus II show poor level of health promotion behaviors as reported among 61.3% with "Poor" level (M±SD= 129.57 ± 19.383). While 36.8% show "Moderate" level of health promotion behaviors.

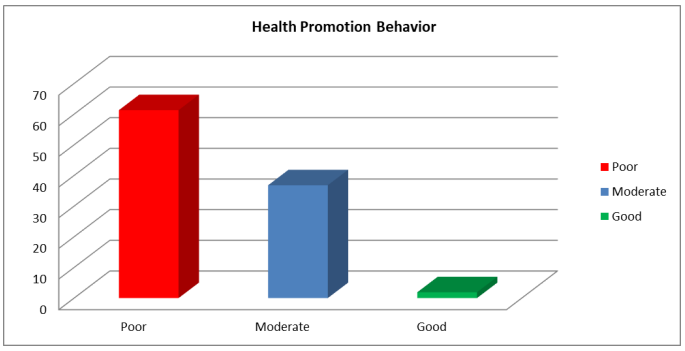

Table 4. Correlation between Health Literacy and Health promotion Behaviors among Clients with Diabetes Mellitus II (N=315)

Overall score	Correlation	P-Value
Health Literacy	617**	0.001
Health promotion behaviors		

**. Correlation is significant at the 0.01 level (2-tailed).

The Table (4) demonstrates a significant positive correlation between health literacy and health promotion behaviors among clients with DM II, as indicated by a Pearson correlation coefficient of 0.617 (p = 0.001). This strong positive relationship reflects that as clients' health literacy increases, their health promotion behaviors become good and higher promotive to health. Also, other dimensions of health promoting behaviors had a positive and significant relationship with health literacy in clients with Diabetes Mellitus II (N=315). Each domain shows a significant positive correlation with health literacy, all with p-values less than 0.001.

The domains "Responsibility to health" (Beta = 0.700) and "Nutrition" (Beta = 0.668) demonstrate the strongest associations with health literacy, followed by "Blood sugar control" (Beta = 0.667) and "Spirituality" (Beta = 0.599). The overall health literacy score (B = 0.755, Beta = 0.617) reveals a strong, positive connection with health promotion behaviors, highlighting the critical role of health literacy in improving health behaviors in individuals with diabetes.

Table 5. Prediction Relationship of Overall Health Literacy and Domains of Health Promotion Behaviors (N=315)

Health Literacy	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
HPB	B	Std. Error	Beta		
Spirituality	.158	.012	.599	13.220	**.001**
Responsibility to health	.178	.010	.700	17.345	**.001**
Stress managements	.129	.010	.592	12.981	**.001**
Personal relationship	.140	.012	.551	11.696	**.001**
Physical activities	.065	.007	.452	8.968	**.001**
Nutrition	.164	.010	.668	15.900	**.001**
Blood sugar control	.140	.009	.667	15.854	**.001**

Diabetic foot control	.146	.011	.599	13.222	**.001**
Overall	.755	.054	.617	13.867	**.001**

Table (5) illustrates the predictive relationship between overall health literacy and various domains of health promotion behaviors (HPB) in clients with Diabetes Mellitus II (N=315). Each domain shows a significant positive correlation with health literacy, all with p-values less than 0.001. The unstandardized coefficients (B) indicate how much health literacy is expected to change with each unit change in the corresponding health promotion behavior domain, while the standardized coefficients (Beta) reflect the strength of the relationship. The domains "Responsibility to health" (Beta = 0.700) and "Nutrition" (Beta = 0.668) demonstrate the strongest associations with health literacy, followed by "Blood sugar control" (Beta = 0.667) and "Spirituality" (Beta = 0.599). The overall health literacy score (B = 0.755, Beta = 0.617) reveals a strong, positive connection with health promotion behaviors, highlighting the critical role of health literacy in improving health behaviors in individuals with diabetes.

DISCUSSION

Promoting health and enhancing quality of life require both adequate health literacy (HL) and engagement in health-promoting behaviors. Health literacy can reduce healthcare costs and alleviate diabetes-related complications[4].

The current study, conducted in Karbala to investigate the relationship between health literacy and health-promoting behaviors among patients with type II diabetes, revealed that the majority of participants (44.8%) had low levels of health literacy. This finding is consistent with previous studies by Javadzade et al. (2019), Protheroe et al. (2016), and Yiğitalp et al. (2021), which reported similarly low health literacy among diabetic patients[21,22,23]. However, contrasting findings were reported in studies by Myung Kyung Lee et al. (Korea) and Mirsamiyazdi et al. (Iran, 2020), which indicated sufficient or even excellent health literacy levels[24,6]. These disparities may be attributed to varying regional factors such as healthcare infrastructure, educational systems, cultural practices, economic status, awareness levels, and the presence (or absence) of public health campaigns.In the present study, the mean score of health-promoting behaviors among patients with diabetes was 129.57 ± 19.38. Notably, more than half (61.3%) exhibited poor health-promoting behaviors. These findings are consistent with the study by Yusefi et al.[25], which also found moderate levels of health-promoting behaviors. Similarly, a study in Iran also reported moderate engagement[6]. In contrast, another study conducted in Ahvaz reported generally good health-promoting behaviors[26]. Such variations may be explained by differences in health awareness, education, socio-cultural and economic factors, policy frameworks, and geographical settings.

Regarding specific behaviors, interpersonal relationships and foot care were the most practiced, while physical activity was the least. These findings align with the study by Tezcan and Karabacak (2022), which also found high scores in interpersonal relations and low scores in physical activity[27]. Similarly, another Iranian study found that while blood glucose monitoring and foot care were prevalent, physical activity remained the least practiced—corroborating the current results[6]. These outcomes suggest that sedentary lifestyles are a common and significant issue among diabetic individuals, exacerbated by low motivation and limited knowledge about the benefits of regular physical activity.

The study also revealed a significant negative correlation between age and both health literacy and health-promoting behaviors. Younger individuals demonstrated higher scores in both domains, consistent with previous findings[25]. Furthermore, education level was significantly associated with better health-promoting behaviors, with individuals holding higher education levels showing greater engagement—supporting the results of other studies[2,28].

A strong, positive correlation was found between health literacy and health-promoting practices. This agrees with studies by Yusefi et al. and Mirsamiyazdi et al., which confirmed that health literacy significantly influences health-promoting behaviors[6,25]. A similar association was observed in a study by Javadzade et al.[21]. Nonetheless, not all findings in the literature are entirely consistent. For example, a study examining the relationship between health literacy and self-care among type II diabetic patients[29] found no significant overall correlation but did identify specific links between health literacy and adherence to medication and dietary guidelines. Such differences may arise from variations in conceptual frameworks—e.g., focusing on self-care versus broader health-promoting behaviors.

Overall, promoting health-promoting behaviors is critical in reducing complications, prolonging life expectancy, and improving the quality of life for individuals with type II diabetes. High levels of health knowledge foster behaviors such as spiritual growth, health responsibility, interpersonal communication, stress management, and physical activity. The results of the current study are in line with those of Barati et al. and Bae et al., which emphasize the significant role of health literacy in shaping healthy behaviors[30,31]. However, due to the specific population and methodology, the generalizability of these findings should be approached with caution.

CONCLUSION

This study concluded that most individuals with type II diabetes show low health literacy and inadequate participation in health-promoting behaviors, underscoring the need for targeted educational programs. Furthermore, the findings highlight the necessity for increased activities to educate behaviors that foster wellness and raising awareness of Personal care practices. Incorporating these concepts into educational syllabus for facilitate improvements in the health outcomes of community members.

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Competing Interest: None

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