Health Literacy Among Diabetic Patients Visiting the Outpatient Department of a Tertiary Care Hospital: A Cross-Sectional Study

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Abstract

Background: Diabetes Mellitus is a metabolic syndrome characterized by hyperglycemia either due to defective insulin secretion or defective insulin action or both. It is estimated to become the 7th leading cause of death by 2030. Health literacy play a significant role in self-care, adherence to medication and clinical outcomes in diseased individual. The objective of this study is to find the prevalence of health literacy among the diabetic patients visiting the outpatient department of a tertiary care hospital.

Methods: A descriptive cross-sectional study was conducted among 422 diabetic patients visiting the outpatient department of a tertiary care hospital from July 2020 to Jan 2021. Ethical approval was obtained from the Institutional Review Committee. Patients aged ≥ 18 years, irrespective of gender, diagnosed with Diabetes Mellitus at least three months before and presenting to the outpatient department for complications or follow-up were included in the study. Convenience sampling was used.

Results: Among 422 diabetic patients, poor health literacy was found among 165 (39.09%) (34.49-43.69 at 95% Confidence Interval). Low adherence to anti-diabetic medication was seen in 78 (47.27%) patients with majority 94 (56.97%) patients having diabetic range HbA1c level and a poor knowledge on diabetes.

Conclusion: There is poor health literacy among diabetic patients that is reflected in low adherence to anti-diabetic medication and overall diabetic self-care. Targeted intervention for health promotion of diabetic patients might be needed.

Keywords: Diabetes; Glycemic control; Health literacy; Knowledge.

Declarations

BACKGROUND

Diabetes Mellitus (DM) is a metabolic syndrome characterized by hyperglycemia either due to defective insulin secretion or defective insulin action or both [1]. In Nepal, the prevalence of DM was found to be 8.5% and estimated to become the 7th leading cause of death globally by 2030 [1 - 4]. Health literacy is the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions [5].

Studies suggest that health literacy plays a significant role in self-care, adherence to medication and clinical outcomes in diseased individuals [6]. There is imminent need of studying the health literacy status among the diabetic patients whose health outcomes are dependent on various lifestyle factors and self-care which reflects the health literacy status of the patients.

Health literacy has been recognized as a pivotal determinant for preventing disease and promoting health and studies done in Nepal have recommended to address the health literacy needs of the people [7]. Similarly, studies also point towards the disproportionate burden of diabetes-related problems among disadvantaged populations with inadequate health literacy [8].

There is a need to study the association of health literacy among the diabetic patients in Nepal as linking this to glycemic control of diabetic patients will be an insightful approach [6, 28]. The objective of this study is to explore the health literacy status among the diabetic patients visiting the outpatient department of a tertiary care hospital in Eastern Nepal.

METHODS

A descriptive cross-sectional study was conducted among 422 diabetic patients visiting the outpatient department at B. P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal from July 2020 to Jan 2021. Ethical approval was obtained from the Institutional Review Committee (Reference number: IRC/1805/020). Patients aged 18 years and above, irrespective of gender, diagnosed with Diabetes Mellitus at least three months before and presenting to the outpatient departments of Department of Internal Medicine and Department of General Practice, BPKIHS for complications or follow-up who consented to participate were included in the study. Patients with diabetes diagnosed less than three months before, who were on oral hypoglycaemic drugs and presenting with complications to the emergency department and with cognitive impairment were excluded from the study. Convenience sampling technique was used and the sample size was calculated using the formula:

$$n = Z^2 \times (p \times q) / e^2$$
$$= 1.96^2 \times (0.50 \times 0.50) / (0.05)^2$$
$$= 384.16$$
$$= 384$$

Where,

n= required sample size

Z= 1.96 at 95% Confidence Interval (CI)

p= prevalence taken as 50% for maximum sample size

q=1-p

e= margin of error, 5%

Adding 10% non-responder bias, the sample size for the study was 422. So, 422 diabetic patients visiting the outpatient departments of the Department of Internal Medicine and Department of General Practice, BPKIHS were selected for the study.

Tools included Morisky Medication Adherence Scale-4 (MMAS-4) to assess the diabetic medication adherence, Diabetes Knowledge Questionnaire (DKQ) to assess the knowledge on diabetes, and Conversational Health Literacy Assessment Tool (CHAT) Questions to assess the health literacy among the diabetic patients [6, 26, 27]. CHAT involved 10 questions on health literacy on 5 different domains: supportive professional relationships, supportive personal relationships, health information access and comprehension, current health behaviours and health promotion barriers and support. The DKQ is a 24-item questionnaire to assess information about patients' understanding of the cause of DM, its complications, blood glucose levels, diet, and physical activity [6, 28].

Data were entered in MS Excel 2016 and analysed using Statistical Package for the Social Sciences (SPSS) Version 21. Point estimate at 95% confidence interval and descriptive statistics were interpreted as frequency, percentage, or as mean and standard deviations as necessary.

RESULTS

Among 422 diabetic patients, poor health literacy was found among 165 (39.09%) (34.49 - 43.69 at 95% Confidence Interval). Assessing health literacy among the diabetic patients under the supportive professional relationship domain, six (3.63%) patients reported lacking the access to any healthcare providers while the rest 159 (96.36%) mentioned visiting the doctors or paramedics trained in modern medicine. Likewise, 109 (66.06%) reported difficulties speaking with the healthcare providers whom they visited usually. Under supportive personal relationship domain, 15 (9.09%) reported difficulties to speak with their friends, family, or neighbors to ask support in the form of emotional or practical assistance about their health, 19 (11.51%) reported they felt easier talking to their friends besides the healthcare providers while 131 (79.39%) reported talking with their

family to be easier. Under health information access and comprehension domain, 46 (27.87%) and 32 (19.39%) patients respectively reported social media like Facebook and Internet sources like Google being their sources of health information apart from the health center, while the remaining 87 (52.72%) patients sought health information from their family, friends, relatives, health sites and media. Likewise, 90 (54.54%) patients reported difficulties to understand information about their health. Under Current health behaviors domain, 125 (75.75%) patients reported being careful about their diet to look after their health, 19 (11.51%) prompted for medications while 131 (79.39%) followed exercises on weekly basis to look after their health. Under health promotion barriers and support domain, 112 (67.87%) patients found difficulties in maintaining diet on a regular basis to look after their health, while 72 (43.63%) and 54 (32.72%) respectively reported exercise and access to medicine being easier alternatives for them to look after their health. About 64 (38.78%) patients reported having a health insurance with average expenditure on medication per month being Rs. 4079.39 ± 936.48. Knowledge on diabetes assessed through DKQ tool revealed a poor DKQ score of 12.58 ± 2.33, which is less than half of the total score.

Socio-demographic profile of the patients with low adherence (78) revealed the mean age as 53.70 ± 11.90 years with 106 (64.24%) male patients and a male-to-female sex ratio of 1.79:1. Majority were Hindu 93 (56.36%), Brahmin 40 (24.24%) and Janajati 40 (24.24%) ethnic population, married 127 (76.96%), literate 131 (79.39%) and unemployed 83 (50.30%). Similarly, most were from nuclear family 87 (52.72%) with per capita income greater than five dollars a day 152 (92.12%) **(Table 1)**.

Clinical characteristics of the patients revealed one - third patients 55 (33.33%) having diagnosis of diabetes done 2 - 5 years' back, mostly from the doctors 94 (56.96%), and in the private clinics 84 (50.90%). Almost all patients 153 (92.73%) were under some anti-diabetic medications, majority 99 (60.00%) being under more than one medication. Two - third 127 (76.97%) patients had one or more comorbid conditions, with 50 (30.30%) patients being current smokers, 35 (21.21%) current users of smokeless tobacco and 53 (32.12%) current alcohol consumers. MMAS-4 tool reported low adherence to anti-diabetic medication in 78 (47.27%), medium adherence in 65 (39.40%) and high adherence in 22 (13.33%) patients. Likewise, majority 94 (56.97%) patients had diabetic range HbA1c level with serum random blood sugar level lying equal and above 200 mg/dl in 79 (47.88%) patients **(Table 2)**.

Table 1: Socio-demographic Characteristics (n=165)

Characteristics		n (%)
Age in years (mean±SD)	53.70 ± 11.90	
Gender	Male	106 (64.24)
	Female	59 (35.75)
Religion	Hindu	93 (56.36)
	Muslim	19 (11.51)
	Buddhist	37 (22.42)
	Others	16 (9.69)
Ethnicity	Brahmin	40 (24.24)
	Chhetri	36 (21.81)
	Madhesi	19 (11.51)
	Janajati	40 (24.24)
	Dalit	9 (5.45)
	Others	21 (12.72)
Marital Status	Unmarried	13 (7.87)
	Married	127 (76.96)
	Divorced/Separated	25 (15.15)
Education history	Illiterate	34 (20.61)
	Literate	131 (79.39)
Occupation	Employed	82 (49.70)
	Unemployed	83 (50.30)
Economic Status	< $5/day per capita	13 (7.87)
	>= $5/day per capita	152 (92.12)
Family Type	Nuclear	87 (52.72)
	Joint	78 (47.27)

Table 2: Clinical characteristics of the patients with poor adherence (n=165)

Characteristics		n (%)
Time since diagnosis	< 1 year	25 (15.15)
	2 - 5 years	55 (33.33)
	5 - 10 years	33 (20.00)
	> 10 years	52 (31.52)
Diagnosed by	Doctor	94 (56.96)
	Ayurvedic Practitioners	56 (33.94)
	Paramedics	15 (9.10)
Setup of diagnosis	Government hospital	41 (24.85)
	Private clinic	84 (50.90)
	Ayurvedic clinic	15 (9.10)
	Private pharmacies	25 (15.15)
Medication Status	Under medication	153 (92.73)
	No medication	12 (7.27)
Patients taking Medication	> 1 medication	99 (60.00)
	Single Medication	66 (40.00)
Comorbidities	Present	127 (76.97)
	Absent	38 (23.03)
Current Behavior	Smoking	50 (30.30)
	Smokeless tobacco	35 (21.21)
	Alcohol use	53 (32.12)
Adherence to Medication (MMAS-4)	High Adherence	22 (13.33)
	Medium Adherence	65 (39.40)
	Low Adherence	78 (47.27)
HbA1c level	Normal (4% - 5.6%)	28 (16.97)
	Risk (5.7% - 6.4%)	43 (26.06)
	Diabetic (> 6.5%)	94 (56.97)
RBS Level	80-140 mg/dl	37 (22.42)
	140-200 mg/dl	49 (29.70)
	>= 200 mg/dl	79 (47.88)

DISCUSSION

Diabetes care needs sufficient levels of knowledge, self-care behaviours and adherence to medications. For effective management and in order to have good glycemic control, patients need to have adequate levels of knowledge of diabetes regarding self-care, a concept that can promote adherence to medications, good dietary pattern and physical activity [9 - 12].

This study was an attempt to assess the knowledge, self-care behaviours, health literacy and glycemic control among patients visiting the out-patient department of a tertiary care hospital. The study site being a tertiary centre located in urban area receives patients mostly from urban areas and no patients are from below poverty line. However, it is striking that the level of knowledge about diabetes is not satisfactory and the average DKQ score is about half the full score. This shows that even in urban area the interventions to provide health education about non-communicable diseases particularly diabetes is necessary. The assessment of health literacy showed that there is communication barrier between patients and professionals. The majority of patients are dependent on non-formal modern source of health education with the socio-economic change of society. There is difficulty in lifestyle modification for diabetic patients not only due of lack of access to information but also various factors, lack of resources being a major one. The need to address diabetes as one of the non-communicable diseases is challenging because of poor health literacy, lack of resources and most importantly health services not reaching the left behinds.

The socio-demographic findings in this study showed higher prevalence of diabetes among male, older people (mean age = 53.7 ± 11.9 years), literate, Hindu religion and those with per capita equal to or greater than $5 per day which seemed consistent with some studies done among diabetic patients [11, 19, 20]. The findings of our study are not consistent with the findings to a systematic review in 2015 which showed higher prevalence among females and those with low education [21]. This is explainable by the fact that this is a study done in a clinical setting and may not be generalizable. In this study, average duration of diabetes was found to be 2 - 5 years in about one third of the patients which was similar to a study done in Ethiopia [11]. This may be due to the fact that the mean age of the studied population is about 53.7 ± 11.9 years and the risk of suffering from diabetes in Nepalese population is found to be increasing from the age of 40 years and above [21 - 22]. This study also showed that most patients were diagnosed to be diabetic at private clinics rather the government hospitals which can be due to organizational challenges including health provider shortages, long wait times, high patient loads and minimal time available to spend with patients, often resulting in incomprehensive care with no routine measurement of blood glucose level as most of the reliable government-owned laboratories are located in the capital city [22 - 23].

On evaluating the clinical characteristics of the patients, most of the patients were found to be taking more than one anti-diabetic medications which could be due to the fact that most of them also had other co-morbid conditions. Thereby decreasing the compliance with single drug therapy and hence increasing the need of more medications and also the economic burden to the patient [22]. Similarly, majority of the patients were poorly adherent to medications though most of the patients agreed on being under medications. This can be due to low health literacy on diabetes and poor glycemic control among Nepalese population as health literacy is found to play a significant role in self-care, adherence to medication and clinical outcomes in diseased individual and poor glycemic control being associated with socio-demographic factors, behavioural and life-style related factors, co-morbidities, economic development affect the overall drug compliance [4, 13, 14, 18, 21 - 22, 26 - 30]. It is also evident that knowledge about glycemic control and good health literacy can motivate and help diabetic patients to seek proper treatment and control the disease through good adherence to medications [11, 24 - 27].

The risk for diabetic complications is said to be minimized by the control of hyperglycemia (HbA1c ≤ 7% and RBS < 140mg/dl) [4]. But maximum number of patients in this study lie under diabetic range for HbA1c and RBS which increases the likelihood of development of other co-morbid conditions [22 - 24].

CONCLUSION

There is poor health literacy among diabetic patients that is reflected in low adherence to anti-diabetic medication and overall diabetic self-care. The factors affecting the adherence to anti-diabetic drugs and self-care can be several including the support system and health literacy of the patient. Targeted patient-centered comprehensive intervention for health promotion of diabetic patients is essential.

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