

Status of Health Literacy and associated factors among Type 2 Diabetes Mellitus in Nepal

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ABSTRACT

Background: Diabetes is an iceberg disease and a major public health issue in Nepal. The prevalence and incidence of type 2 diabetes have occurred globally, especially affecting societies in economic transition, mostly newly industrialized and developing countries. Health literacy has become crucial to develop skills and knowledge of a person to access, understand and use the information and understand health determinants to make health and health care decisions and implement healthy behaviors.

Objectives: The study aimed to assess health literacy level and associated factors among type 2 diabetes patients.

Methods: A community-based cross-sectional study was conducted from August 2019 to January 2020. Health literacy level was measured using the European health survey questionnaire. This study used the SPSS version 16 on the received data sets to perform statistical analysis. Univariate logistic regression and multivariate logistic regression models were carried out to identify the independent factors related to health literacy.

Results: The study showed that majority (86.3 %) of the diabetes patients had adequate health literacy. Gender, marital status, educational status, occupational status, and hospitalization were found statistically significant with health literacy. Marital Status (AOR = 0.18, 95% CI: 0.04-0.71, $p = 0.001$), educational status (AOR = 7.06, 95% CI: 2.13-23.36, $p = 0.001$), hospitalization (AOR = 8.38, 95% CI: 1.85-37.92, $p = 0.001$) and treatment compliance (AOR = 4.28, 95% CI: 1.57-11.63, $p = 0.001$) were found to be predictors for the health literacy.

Conclusion: The study findings indicated more than a fourth-fifth of the respondents had adequate health literacy. Health Literacy plays a vital role in the prevention and management of the disease, so, the government should emphasize on uplift the education level and provide health counseling during diagnosis and treatment.

Keywords: Diabetes, Health Literacy, Nepal

1. Introduction

Diabetes is seventh leading causes of death around the world and cause 12% of all hospitalization in Nepal [1,2]. Among the major non communicable diseases, diabetes caused 1.6 million deaths which covers four percent of all non-communicable disease deaths and three percent of all global deaths worldwide [2]. Diabetes is rapidly growing public health problem affecting millions of people worldwide. WHO agreed to halt the rise in diabetes and obesity by 2025 [3]. Diabetes is a life-long challenge that needs behavioral change, most often through education and support, offered by health care practitioners such that the ill person will be able to perform self-care [4]. Out of 27 million inhabitants of Nepal, 673,000 people live with diabetes which can be avoided with healthy diet, physical activity, medication and regular screening for complications and treatment as needed [5,6]. Type 2 diabetes is most common type of diabetes, accounting for around 90% of all diabetes cases [7].

Health literacy is the skills and knowledge of a person to access, understand and use information, knowledge on understanding health determinants to make health and health care decisions and implement healthy behaviors [8,9]. It has been increasingly identified as an underlying cause of NCDs and

skills are essential to enable self-management and shared decision-making in patients with type 2 diabetes mellitus [10,11].

Health literacy plays a crucial role for the prevention of diabetes and promoting healthy foods and reduce the intake of unhealthy food and sugar-sweetened beverage, the policy tools include fiscal measures to raise the price of sugar-sweetened beverages and unhealthy foods and/or lower the price of healthier foods; regulation of marketing of food and non-alcoholic beverages to children; nutrition labeling; and a package of interventions to improve early childhood nutrition [12,13]. Improving health literacy is an important public health goal (14). The aim of the study is to assess the level of health literacy and its associated factors among type 2 diabetes mellitus patients.

2. Methods

2.1 Study design, setting and period

A community based cross-sectional study design was conducted among type 2 diabetes mellitus patients in Pokhara Metropolitan City, Nepal between August, 2019 and January, 2020.

2.2 Study population and eligibility criteria

The study population were all the diagnosed type 2 diabetic patients who were under diabetes medication of selected wards of Pokhara Metropolitan City. The patients who

were above 18 years and were registered in the peripheral health facility of selected wards were included in the study. Most of the selected wards were previously intervened by an organization on NCDs through different research.

2.3 Sample calculation and recruitment

Type 2 diabetes mellitus patients under medication, aged 18 years and above were the most important selection criteria for participants. Sample size was calculated as proportion of problematic health literacy among type 2 diabetes mellitus patients was 19.9 according to Shrestha A et al. study done in Kathmandu [15]. The Cochran formula was used to calculate the sample size and the final sample size was 204.

A multistage probability sampling method was used in this study. **First Stage:** One metropolitan city was selected for the study out of six metropolitan city of Nepal. **Second Stage:** Altogether there are 33 wards in the Pokhara metropolitan city, 8 wards of the Pokhara Metropolitan City were chosen randomly. **Third Stage:** The list of the diabetic patient was obtained from Grass-root level health facility, Primary Hospital and Diabetes Diagnostic centers. **Fourth stage:** The respondents who are under medication were selected randomly from the sampling frame. Random number table was generated from the

excel and was saved in laptop and accordingly the participants who were assigned from 1 to 208 were included in the study, as four of the respondents who were assigned within 204 were at abroad. Contact number of the respondents made easily access to search the respondent's home and in some case female community health volunteer (FCHVs) of the respective wards were contacted for the help and support in identifying the respondent's home.

2.4 Data collection instruments and procedure

Health literacy is influenced by different factors including socio-demographic factors, health care facility related factors, lifestyle related factors. We used a structured questionnaire that have four parts: socio-demographic characteristics, disease related factors, lifestyle related factors and health literacy. Interview schedule as a structured questionnaire was used as data collection tools. Structured questionnaire was made in KOBO toolbox and tablet was used to collect the data. All the data was saved in Excel formats and necessary coding were done.

Health Literacy was measured using a translated and pretested HL questionnaire (HLS-EU-ASIA-Q Europe Asia health literacy survey questionnaire). The HLS-EU-ASIA-Q is a validated questionnaire that measures three

domains of HL: health care, disease prevention, and health promotion. The questionnaire was translated into Nepali and re-checked via translation from Nepali back to English. The questionnaire uses a 4-point Likert scale (1=*very difficult*, 2=*fair difficult*, 3=*fair easy*, and 4=*very easy*). The items were dichotomized into two categories 'easy' ('fairly' or 'very easy' = 1) and 'difficult' ('fairly' and 'very difficult' = 0). The total HL score ranged from 0 to 16. The score 0-8 was classified as inadequate health literacy; 9-12 as problematic health literacy and 13-16 as adequate health literacy[15–18]. The inadequate and problematic was further merged and classified as inadequate for bivariate analysis.

2.5 Ethical Approval and patient Consent

The study received ethical approval from Manmohan Memorial Institute of Health Sciences (No: 448) on 15th September, 2019. Permission was also obtained from Pokhara Metropolitan city. All the participants were fully informed regarding study objectives and written informed consent was obtained from participants. Confidentiality of the data was fully maintained. All data was stored in the computer database which was accessible only to the researcher with password protection and only shared with the research team members.

2.6 Statistical analysis

Raw data was edited manually to check completeness and accuracy. Data was collected through KOBO and all the responses was saved in excel format where necessary coding was done and then transferred to IBM statistical package for social sciences (SPSS) V.16.0 for analysis. Descriptive statistics was computed to describe socio-demographic profile of participants and health literacy. Univariate logistic regression and multiple logistic regression model was carried out to identify the most independent factors related to the health literacy. The odds ratio and 95% CI was reported while showing the association between outcome and independent variables and the results were considered significant ($p < 0.05$).

3. Results

Table 1 shows more than half (50.9%) of respondents were above 50 years. More than two-fifth (47.5%) of respondents were male. Nearly half (52.9%) of respondents belonged to upper caste. Most of the respondents (93.6%) were married. More than four-fifth (81.9%) respondents have restricted meal habit. Nearly two-third (64.7%) of the respondents were not hospitalized. Majority of respondents (85.8%) don't take alcohol and majority (91.7%) respondents don't smoke currently.

Table 1: Basic characteristics of the respondents (n=204)

Characteristics	Number (n)	Percentage (%)
Age group (in years)		
30-40	30	14.7
40-50	53	26.0
≥50	121	59.3
Sex		
Male	107	52.5
Female	97	47.5
Family Type		
Nuclear	101	49.5
Joint	103	50.5
Ethnicity		
Upper caste groups	108	52.9
Relatively advantaged Janajatis	53	26.0
Dalit	26	12.7
Disadvantaged Janajatis	17	8.3
Education		
Illiterate	29	14.2
Informal	38	18.6
Primary	42	20.6
Secondary	56	27.5
Higher secondary	24	11.8
Bachelor and above	15	7.4
Occupation		
Agriculture	58	28.4
Homemaker	54	26.5
Business	34	16.7
Retire/Pension	22	10.8
Government service	18	8.8
Private services	11	5.4
Daily wages	7	3.4
Marital status		
Married	191	93.6
Widow	13	6.4
Meal Habit		
Restricted	167	81.9
Unrestricted	37	18.1
Hospitalization		
Yes	72	35.3
No	132	64.7
Alcohol intake (Past)		
Yes	48	23.5
No	156	76.5
Alcohol intake (Current)		
Yes	29	14.2
No	175	85.8
Smoking (Past)		
Yes	28	13.7
No	176	86.3
Smoking (Current)		
Yes	17	8.3
No	187	91.7

Figure 1 shows most of the respondents (86.3%) had adequate health literacy, one in tenth (9.8%) respondents had inadequate health literacy and very few (3.9%) had problematic health literacy. For the bivariate analysis, the inadequate and problematic health literacy was merged and categorized as limited literacy and adequate literacy.

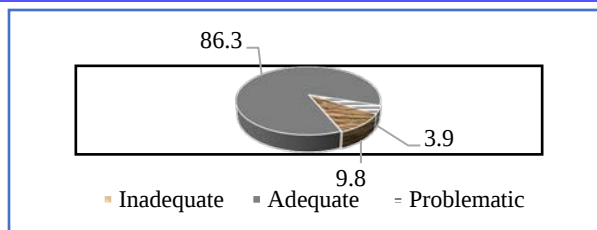


Figure 1 : Level of Health Literacy

Table 2 shows significant association between sex ($p=0.001$), marital status ($p=0.001$), educational status ($p=0.001$) and occupation status ($p=0.001$) with health literacy in bivariate analysis. Marital status and Educational status

Table 2: Association between Socio-demographic Characteristics on the Type 2 Diabetes Mellitus Patients and level of Health Literacy

Variables	Health Literacy		Bi-Variate		Multivariate		P-Value
	Inadequate (%)	Adequate (%)	Crude OR	95% CI	AOR	95% CI	
Age							0.16
≥50 Years	20 (16.5)	101(83.5)	1	1	1	1	
<50 Years	8 (9.6)	75 (90.4)	1.856	0.77-4.44	0.71	0.24-2.07	
Sex							0.001
Female	22 (22.7)	75 (77.3)	1	1	1	1	
Male	6 (5.6)	101(94.4)	4.938	1.90-12.77	1.08	0.29-4.00	
Marital Status							0.001
Married	20 (10.5)	171(89.5)	1	1	1	1	
Widow	8 (61.5)	5 (38.5)	13.680	4.08-45.85	0.18	0.04-0.71	
Educational Status							0.001
Illiterate	22 (32.8)	45 (67.2)	1	1	1	1	
Literate	6 (4.4)	131(95.6)	10.674	4.07-27.99	7.06	2.13-23.36	
Occupational Status							0.001
Unemployed	15 (27.8)	39 (72.2)	1	1	1	1	
Employed	13 (8.7)	137(91.3)	4.053	1.77-9.23	1.67	0.56-4.87	

Table 3 shows exercise daily; treatment compliance was found statistically associated with health literacy. Respondents who had hospitalized were 8.58 times more likely to have adequate health literacy. Consumption of

alcohol, smoking, frequency of tablets, type of health facility, co-morbidity, medication cost, exercise daily and complication weren't found statistically significant with health literacy.

Table 3: Association between Life style and Disease related Characteristics on the Type 2 Diabetes Mellitus Patients and level of Health Literacy

Variables	Health Literacy		Bi-Variate		Multivariate		p-Value
	Inadequate (%)	Adequate (%)	Crude OR	95%,CI	AOR	95%,CI	
Hospitalization							0.004
No	26 (19.7)	106 (80.3)	1	1	1	1	
Yes	2 (2.8)	70 (97.2)	8.58	1.97-37.32	8.38	1.85-37.92	
Consumption of Alcohol							0.57
No	25 (14.3)	150 (85.7)	1	1	1	1	
Yes	3 (10.3)	20 (89.7)	1.44	0.40-5.13	2.93	0.54-15.97	
Smoking							0.22
No	24 (12.8)	163 (87.2)	1	1	1	1	
Yes	4 (23.5)	13 (76.5)	0.47	0.14-1.58	0.26	0.05-1.33	
Frequency of Tablet							0.38
BID	25 (14.9)	143 (85.1)	1	1	1	1	
Once	3 (8.3)	33 (91.7)	3.69	0.92-14.67	1.92	0.54-6.75	
Type of HF							0.14
Public	19 (17.0)	93 (83.0)	1	1	1	1	
Private	9 (9.8)	83 (90.2)	1.88	0.80-4.39	2.00	0.77-5.21	
Co-Morbidity							0.25
Yes	16 (16.7)	80 (83.3)	1	1	1	1	
No	12 (11.1)	96 (88.9)	1.60	0.71-3.57	2.41	0.96-6.05	
Medication Cost							0.14
Free/Insurance	3 (6.8)	41 (93.2)	1	1	1	1	
Pay	25 (15.6)	135 (84.4)	2.53	0.72-8.81	0.35	0.08-1.38	
Exercise							0.28
No	26 (14.8)	150 (85.2)	1	1	1	1	
Yes	2 (7.1)	26 (92.9)	2.25	0.50-10.07	2.422	0.37-15.72	
Complication							0.50
Yes	2 (9.1)	20 (90.9)	1	1	1	1	
No	26 (14.3)	156 (85.7)	1.66	0.36-7.55	0.570	0.08-3.82	
Treatment Compliance							0.001
Non-Compliance	21 (23.6)	68 (76.4)	1	1	1	1	
Compliance	7 (6.1)	108 (93.9)	4.765	1.92-11.80	4.28	1.57-11.63	

4. Discussion

This study aimed to provide comprehension insight on status of health literacy and associated factors among Type 2 diabetes mellitus patients in Nepal. Health literacy among the diabetes mellitus patients is important determinants and influenced by a number of contributing factors. In the present

study, 13.7% had limited literacy which contrasts with the findings of the study done by Azreena E et. al which shows 85.8% had limited health literacy level [19]. Other contrasts finding was found in the study done by Schillinger et. al where 51.5% had inadequate health literacy [20]. It might be due to the lower proportion of illiterate participants

supporting to lower proportion of limited health literacy. The education level of participants in the urban areas was literally high compared with rural areas which support for adequate health literacy.

In this study, 9.8% had inadequate health literacy, 3.9% had problematic and 86.3% had adequate health literacy level where contradictory finding was showed in the study done by Shrestha A et al where 41% had inadequate health literacy, 19.9 % had problematic health literacy and 39.9% had adequate health literacy [15].

In bivariate analysis, our study showed statistical association of level of education (p 0.001) with health literacy which is similar with the findings of the study done by Azreena E et al (p 0.043) [19]. Our study observed no statistical association of age (p 0.165) with health literacy which corresponds with the findings of study of Azreena et al (p 0.117), Ziapor A et al (p 0.361) [19,21]. Gender was found statistically significant (p 0.001) which contrasts with findings of Azreena E et al which shows no statistical association (p 0.142) [19]. In present study marital status (p 0.001) was found statistically associated with health literacy which contrasts with the findings of study done by Ziapor A et al (p 0.479) [21]. Smoking status wasn't found statistically significant in our study (p 0.229) which

corresponds with the findings of study by Ziapor A et al (p 0.985) [21]. Some studies showed that health literacy is associated with a reduction in the likelihood of having a comorbid condition [14]. In our study people with comorbidity were not found statistically associated with health literacy.

All the scientific studies are with some constraint. Similarly, this study has also some limitations, which are supportive for further investigations in future. Most of the selected wards of the study was intervened by one of the health organization focusing NCDs and female community health volunteers were mobilized to generate health awareness and respondents were intervened through different research activities thus, health literacy was found to be adequate. Many aspects were not explored in the research like knowledge of diabetes and self-diabetes management. Variability of effect sizes can be diminished with increasing sample size. Health literacy plays an important role in self-diabetes management and also allows patients to communicate effectively with health care providers. Although health literacy level and associated factors were measured at a point of time, the causal relationships could not be determined. Despite all limitations, the study showed and expanded the level of the health literacy and associated factors in patients with diabetes mellitus.

5. Conclusion

The study findings indicated more than fourth fifth of the respondents had adequate health literacy. Gender, marital status, educational status, occupational status and exercise daily were found statistically significantly associated with health literacy in bi-variate logistic regression analysis and marital status, educational status and daily exercise were only found statistically significantly associated with health literacy in multivariate logistic regression analysis. Health literacy plays a crucial role in prevention and management of the disease so, government should emphasis on uplift the education level and provide health counseling during diagnosis and treatment.

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Compliance of medication leads to quality of life of the diabetes patients which can be assured by improving health literacy thus, proper and adequate health literacy should be delivered to all the people of the community.

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Conflict of Interest

The authors have declared that no competing interests exist.

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