Original Article

Knowledge of Diabetes among Diabetic Patients Attending at Tertiary Level Hospital

Krishna Devi Shrestha[1,*], Takma KC[2], Rachana Ghimire[3]

[1]Assoc. Prof., Maharajgunj Nursing Campus, Institute of Medicine, Kathmandu, Nepal

[2] Prof., Institute of Medicine, Tribhuvan University, Kathamndu, Nepal

[3] Lect., Maharajgunj Nursing Campus, Institute of Medicine, Kathmandu, Nepal

***Correspondence:** krishna_kr06@yahoo.com

ABSTRACT

Background: The prevalence of Diabetes Mellitus is growing at an alarming rate across the globe. Obtaining knowledge regarding diabetes is the initial step in formulating a prevention program for diabetes which can assist in the early detection of the disease and reduce complications. Hence, the objective of this study was to assess the level of knowledge regarding aspects of diabetes among diabetic patients.

Methods: The study was conducted using a descriptive cross-sectional research design at Tribhuvan University Teaching Hospital (TUTH). A purposive sampling technique was adopted. Data was collected in 3 months from December 2017 to March 2018 by using a structured questionnaire through interview method among 422 respondents fulfilling the inclusion criteria attending in medical OPD. Analysis was done by descriptive and inferential statistics.

Results: The study findings revealed that nearly half of the respondents (43.4%) had moderately adequate knowledge, 36.5% of respondents had adequate and 20.1% had inadequate knowledge on diabetes mellitus. The overall knowledge score was 65.37±SD17.58. Knowledge scores in different aspects of diabetes revealed that respondents had adequate knowledge on diet (79.3%), medicine (78.4%), complications with diabetes mellitus (75.8%) and moderately adequate knowledge was found on the meaning of diabetes (62.5%), exercise (67%), diabetic foot care (52.6%), blood glucose monitoring (53.3%) and follow up visit (75.8%). Diabetic patient's age (0.026), sex (0.012), education (<0.001), occupation (<0.001), area of residence (0.005) and attended in diabetic counseling (<0.001) were significantly associated with level of knowledge.

Conclusion: It is concluded that less than half of the diabetes patients have adequate knowledge on diabetes mellitus and it is associated with age, sex, education, occupation, area of residence and attended diabetic counseling.

Keywords: Diabetic patient, glycemic control, knowledge

INTRODUCTION

Diabetes is one of the most prevalent non-communicable disease-causing global challenges to the health and well–being of individuals, families and societies. International Diabetes Federation (IDF).[1]highlights that globally, 537 million adults (20-79 years) are living with diabetes and in the South East Asia (SEA) Region, it comprised of 90 million (1 in 11 adults) people. By 2030, this will rise to 643 million worldwide and 113 million in SEA. Every 1 in 2 adults with diabetes are undiagnosed. Nepal is one of the 6 countries of the IDF SEA region where1.1 million cases of diabetes were present in 2021 and its prevalence in adult was 6.3% (20-79yrs). Every 5 seconds a person die with diabetes and is responsible for 6.7 million deaths worldwide in 2021.[2]The burden of diabetes is considerably high especially in developing countries. More than 80 % of diabetes deaths occur in low and middle-income

countries.[3] By 2030, diabetes will be the 7th leading cause of death.[4]

Glycemic control is considered as the main therapeutic goal for prevention of organ damage and other complications of diabetes. Kalyango, Owino and Nambuya[5] mentioned that non-compliance, poverty, lack of knowledge and poor follow ups are the main factors affecting in poor glycemic control.[6] Compliance to dietary modifications, medications, regular follow-up, foot care and physical activity [7] as well as frequent self- monitoring of blood glucose (SMBG) are essential for optimal glycemic control as well as minimizing long-term complications.[8] Most of the type-2 diabetic patients have unsatisfactory knowledge and inadequate compliance regarding its management.[9],[10] stated that only 23.8% had good knowledge regarding diabetes, while 19.2% had poor knowledge regarding the disease and self- care.

Patients' education on diabetes is an integral component of diabetic care and it creates the basis for self-management.[6] Studies have shown that increasing knowledge regarding disease and its complications has significant benefits with regard to patient compliance to treatment and decreasing complications associated with the disease. In context of Nepal, treatment and management of diabetes is a major challenge and diabetes cases are highly prevalent due to lack of public awareness and knowledge regarding diabetes.[11]Mohammadi et al. [12]mentioned that despite the advancement of treatment modalities and research in disease, the patient's level of knowledge remains low affecting the glycemic control. So, in order to increase patient's compliance, controlling the glycemic level and preventing & decreasing the complications associated with the disease, assessment of patient's knowledge in different aspects including foot care, blood glucose monitoring is very crucial among diabetic patients.

METHODS

A descriptive cross sectional research design was adopted to assess the level of knowledge and to measure the association of level of knowledge with selected variables among diabetes patient. Non-probability purposive sampling technique was adopted. Data was collected among 422 respondents diagnosed as type II DM, on treatment for 3 month and more and attending at Medical OPD of TUTH. Ethical approval was obtained from Institutional Review Committee of Institute of Medicine, Tribhuvan University. After taking administrative written permission from the TUTH, written consent was obtained from each respondent prior to data collection. Voluntary participation and withdrawal from the study at any time without giving reason was considered. Confidentiality was maintained by using the code no. in each form and assuring the respondents that the given information to be used only for study purpose without disclosing their identity.

Data was collected from 25thDecember 2017 to 23rd March 2018. Each patient was interviewed face-to-face in Nepali language by using structured questionnaire which consisted of two parts; Part I: Demographic characteristics, Part II: Patient's knowledge on diabetes. Knowledge was assessed in different aspects i.e., diabetes mellitus, diet, exercise, medicine, diabetic foot care, blood sugar monitoring, follow up and diabetes complications, which includes total 32 items developed by researcher themselves after reviewing the extensive literature reviewed. The responses were scored and each correct response was awarded one (1) score while every incorrect response was awarded Zero (0) score. In multiple response questions, one score was given for each correct response. Based on the total score, the level of knowledge of the respondents was categorized as: adequate knowledge (>75%), moderately adequate knowledge (50%-75%) and inadequate knowledge (<50%).[12] The validity of the instrument was established by consulting with Head of Department of Internal Medicine and Unit Chief of Medicine Department of TUTH, senior dietician, subject experts and reviewing the related literature. Pretesting was done in 10% of sample (43 respondents) receiving diabetes treatment attending at medical OPD of TUTH. Necessary modification was done based on the findings of the pre-testing. The collected data was entered into SPSS version 16 and analysis was done by using descriptive (frequency, percentage, mean and SD) and inferential statistics (chi square test). A p value of <0.05 was assumed to be statistically significant.

RESULTS

Table 1: Socio-demographic Characteristics of the Respondents (n=422)

Variables	Number	Percentage
Age in years		
≤ 40	59	14.0
41-60	227	53.8
>60	136	32.2
Mean age± SD: 54.8±12.36		
Age of Diagnosis (in years)		
≤ 30	26	6.2
31 – 40	86	20.4
41 – 50	134	31.8
>50	176	41.7
Mean age at diagnosis 48.36±11.55		
Sex		
Male	196	46.4
Female	226	53.6
Marital Status		
Married	228	54.0
Unmarried	194	46.0
Ethnicity		
Brahmin/Chhetri	218	51.7
Adivasi Janajati	169	40.0
Terai/Madhesi	16	3.8
Dalit	14	3.3
Others	5	1.2
BMI		
< 18.50 (Underweight)	9	2.1
18.50 - 24.99 (Normal)	256	60.7
25.00 - 29.99 (Over weight)	122	28.9
>30.00 (Obese)	35	8.3

Table 1 reveals more than half of the respondents (53.8%) were between the age of 41-60 years and nearly one third of the respondent (32.2%) were more than 60 years. The mean age was 54.8±12.36. Forty one percent respondents were diagnosed at the age of more than 50years and average diagnosed age was 48.36±11.55. More than half of the respondents (53.6%) were female, 54% were married, and 51.7% were Brahmin / Chhetri. Regarding BMI, 60.7% had normal BMI followed by 28.9% was overweight.

Table 2: Respondents' Socio- demographic Characteristics (n=422)

Variables	Number	Percentage
Area of Residence		
Urban	359	85.1
Rural	63	14.9
Can't read and write	98	23.2
Primary level	131	31.1
Secondary level	105	24.9
Higher secondary level and above	88	20.9
Occupation		
Service	68	16.1
Business	87	20.6
Agriculture	64	15.2
Homemaker	130	30.8
Retired	47	11.1
Unemployed	26	6.2
Family history of diabetes	181	42.9

Table 2 shows that the majority of the respondents (85.1%) were from urban area, 24.9% respondent had secondary level education whereas 23.2% respondents were illiterate. Nearly one third of the respondents (30.8%) were homemaker and 16.1% were involved in service. Among them, 42.9% had family history of diabetes mellitus.

Table 3: Respondents' Disease related Characteristics (n=422)

Variables	Number	Percentage
Duration of DM Diagnosis (in years)		
< 1	49	11.6
1-5	157	37.2
5-10	107	25.4
>10	109	25.8
By symptoms	233	55.2
By chance	189	44.8
Every 3 monthly	195	46.2
Every 6 monthly	33	7.8
Yearly	20	4.7
As per advice	97	23.0
As per need	77	18.2
Current treatment modalities*		
Oral medicine	385	91.2
Insulin	65	15.4
Diet control	361	85.5
Exercise	247	58.5
Weight control	114	27.0

**Multiple Responses*

Table 3 reveals that 25.8% of respondents had been diagnosed as diabetes in >10 years and only 11.6% of respondents had <1 year duration of DM diagnosis, 55.2% discovered DM by symptoms, 26.5% had a previous history of hospitalization due to DM. Nearly half of the respondents (46.2%) visit the health care center every 3 months and 18.2% did visit as per need. Most of the respondents (91.2%) were taking

oral medicine as a treatment modality followed by 85.5% were in diet control and 58.5% of respondents were involved in exercise, and 64.2% had attended diabetic counseling.**Table 4: Respondents' Level of Knowledge on Diabetes Mellitus** (n=422)

Level of Knowledge	Number	Percentage
Adequate (>75%)	154	36.4
Moderately Adequate (50-75%)	183	43.4
Inadequate (<50%)	85	20.1
Overall, Knowledge Mean ± SD 65.37 ±17.58		

Table 4 reveals the respondents' level of knowledge on diabetes mellitus. Out of 422 respondents, nearly half of the respondents (43.4%) had moderately adequate knowledge, 36.5% respondents had adequate and 20.1% had inadequate knowledge on diabetes mellitus. The overall mean knowledge score was 65.37 with SD17.58.

Table 5: Respondents' Knowledge Score in Different Aspects of Diabetes Mellitus (n=422)

Items	Minimum	Maximum	Mean	SD
Meaning of Diabetes Mellitus	0.0	100.0	62.59	24.17
Diet	20.0	100.0	79.31	21.10
Exercise	10.0	100.0	67.06	24.65
Medicine	0.0	100.0	78.49	21.61
Diabetic foot care	6.2	93.7	52.60	25.90
Blood glucose monitoring	23.0	92.3	53.37	15.84
Follow up	20.0	100.0	70.56	22.92
Complications	0.0	100.0	75.81	24.04
Overall, Knowledge	11.2	97.7	65.37	17.57

Table 5 shows that adequate scores were found on diet (79.3%), medicine (78.4%), complications with diabetes mellitus (75.8%) and moderately adequate knowledge score was found on meaning of diabetes (62.5%), exercise (67%), diabetic foot care (52.6%), blood glucose monitoring (53.3%) and follow up visit (70.5%) among respondents**.**

Table 6: Association between Levels of Knowledge with Selected Variables (n=422)

Variables	Level of Knowledge			χ^2 Value	p-value
	Adequate	Moderately Adequate	Inadequate		
Age in completed years					
≤ 40	28(47.5)	25(42.4)	6(10.2)	11.063.	0.026*
41 – 60	89(39.2)	93(41)	45(19.8)		
> 61	37(27.2)	65(47.8)	34(25)		
Sex					
Male	86(43.9)	77(39.3)	33(16.8)	8.859	0.012*
Female	68(30.1)	106(49.6)	52(23)		
Education level					

Illiterate	16 (16.3)	46(46.9	36(36.7)	85.602	<0.001*
Primary level	29(22.1)	67(51.1)	35(26.8)		
Secondary level	49(46.7)	46(43.8)	10(9.5)		
Higher secondary level and above	60(68.2)	24(27.3)	4(4.5)		
Occupation					
Service	35(51.5)	25(36.8)	8(11.8)	43.635	<0.001*
Business	37(42.5)	37(42.5)	13(14.9)		
Agriculture	14(21.9)	22(34.4)	28(43.8)		
Homemaker	35(26.9)	67(51.5)	28(21.5)		
Retired	22(46.8)	22(46.8)	3(6.4)		
Unemployed	11(42.3)	10(38.5)	5(19.2)		
Urban	138(38.4)	158(44.0)	63(17.5)	10.760	0.005*
Rural	16(25.4)	25(39.7)	22(34.9)		
Attended diabetic counseling					
Yes	41(27.2)	118(43.5)	40(14.8)	16.519	<0.001*
No	8(5.3)	65(43.0)	45(29.8)		

*p value significance in <0.05

Table 6 reveals the association between levels of knowledge with selected variables. There was the significant association between age, sex, education, occupation, area of residence and attended diabetic counseling with level of knowledge of respondents as p *value* is <0.05.

DISCUSSION

The findings of the study reveal the respondents' level of knowledge on diabetes mellitus in which nearly half of the respondents (43.4%) had moderately adequate knowledge and 36.5% respondents had adequate and 20.1% had inadequate knowledge on diabetes mellitus. The overall average knowledge score was 65.37 with SD17.58. In terms of moderately adequate and inadequate knowledge, similar findings were reported by Mohammed et al.[12] which shows that 45.6% participants had good, 37.7% moderate and 16.7% poor knowledge on diabetes in Bangladesh. In consistent with this, Chavanet al.[10] stated that only 23.8% had good knowledge regarding diabetes, while 19.2% participants had poor knowledge indicating that most of the patients were suffering with diabetes for many years had lack of knowledge regarding the disease and self-care. The study conducted by Deepali [13]showed that only 55.5% of patients had adequate knowledge about the disease which is nearly similar to this study and moreover, patients having more knowledge better adhered to the treatment. Regarding knowledge on diabetes, those diabetic patients who had adequate and moderate knowledge level have 2.351 times & 1.243 times respectively more likely to have good compliance than who had inadequate knowledge.[14] Knowledge on Diabetic Mellitus has been linked to attaining better medication adherence and glycemic control.[15]

This study revealed the respondent's knowledge score in different aspects i.e. respondents had adequate knowledge on diet (79.3%), medicine (78.4%), complications with diabetes mellitus (75.8%) and moderate knowledge were found on meaning of diabetes (62.5%), exercise (67%), diabetic foot care (52.6%), blood glucose monitoring (53.3%) and follow up visit (75.8%). Badruddin [2] mentioned that people having diabetes often have inadequate knowledge about its nature, risk factors, associated complications, and this lack of awareness

may affect attitudes and practices towards diabetes self-care. The majority of respondents (92.2%) had poor knowledge of the benefits of exercise, weight loss and a healthy diet.[16]

This study highlighted that there was the significant association between age, sex, education, occupation, area of residence and attended diabetic counseling with level of knowledge as *p value* is <0.05. Shrestha[17] and updhaya[18] found that diabetes knowledge in diabetes patients was poor and associated with age, marital status, education level, occupation, and patients with family history of diabetes.

CONCLUSION

The study concludes that less than half of diabetes patients have adequate knowledge on diabetes mellitus and its management. The level of knowledge of patients with DM tends to be associated with their age, sex, education, occupation, area of residence and attended diabetic counseling. Therefore, it is recommended to consider age, sex, education status, occupation, area of residence and attending diabetic counseling in educating the ents with DM to increase the level of knowledge regarding diabetes and its management.

Conflict of interest: None

ACKNOWLEDGMENT

It's our great pleasure to express sincere gratitude to Tribhuvan University Teaching Hospital for granting permission and support to conduct this study. Similarly, we would like to acknowledge all the valued respondents for their kind cooperation.

REFERENCES

1. IDF Diabetes Atlas, Key global findings 2021[cited 2022 June 26]; Available from: https://diabetesatlas.org/[link]
2. IDF-Atlas-Factsheet, Diabetes in South-East Asia 2021 [cited 2022 June 26]; Available from: https://diabetesatlas.org/idfawp/resource-files/2021/11/IDF-Atlas-Factsheet-2021_SEA.pdf
3. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med. 2006 Nov 28;3(11):e442. https://doi.org/10.1371/journal.pmed.0030442
4. World Health Organization. Global status report on non-communicable diseases2010. https://apps.who.int/iris/bitstream/handle/10665/44579/9789240686458_eng.pdf. [link]
5. Kalyango JN, Owino E, Nambuya AP. Non-adherence to diabetes treatment at Mulago Hospital in Uganda: prevalence and associated factors. Afr Health Sci. 2008 Sep;8(2): 67-73[Link]
6. Badruddin N, Basit A, Hydrie MZ, Hakeem R. Knowledge, attitude and practices of patients visiting a diabetes care unit. Pak J Nutr. 2002; 1 (2):99-102. [link]
7. Santhanakrishnan I, Lakshminarayanan S, Kar SS. Factors affecting compliance to management of diabetes in Urban Health Center of a tertiary care teaching hospital of south India. J Nat Sci Biol Med .2014 Jul;5(2):365-368 [Full Text]
8. Kamuhabwa AR, Charles E. Predictors of poor glycemic control in type 2 diabetic patients attending public hospitals in Dar es Salaam. Drug Health Patient Saf. 2014; 6:155-165 [Full Text]
9. Taha NM, El-azeaz MA, EL-razik BG. Factors affecting compliance of diabetic patients toward therapeutic management. Med. J. Cairo Univ. 2011; 79(2).[FullText]
10. Chavan GM, Waghachavare VB, Gore AD, Chavan VM, Dhobale RV, Dhumale GB. Knowledge about diabetes and relationship between compliance to the management among the diabetic patients from Rural Area of Sangli District, Maharashtra, India. J Family Med Prim Care.2015 Jul;4(3):439. [PMID: 26288789] doi: 10.4103/2249-4863.161349
11. Gyawali B, Sharma R, Neupane D, Mishra SR, van Teijlingen E, Kallestrup P. Prevalence of type 2 diabetes in Nepal: a systematic review and meta-analysis from 2000 to 2014. Glob. Health Action. 2015 Dec 1;8 (1):29088. [link]
12. Mohammadi S, Karim NA, Talib RA, Amani R. Knowledge, attitude and practices on diabetes

among type 2 diabetic patients in Iran: a cross-sectional study. Science. 2015 Jun 2; 3(4):520-524. DOI: 10.11648/j.sjph.20150304.20

13. Deepali BS, Subramanian M, Soumya G, Vikyath BR, Aarudhra P, Ankitha M, et al. Knowledge of diabetes, its complications and treatment adherence among diabetic patients. Int J Community Med Public Health. 2017 Jul; 4 (7):2428-34. doi: http://dx.doi.org/10.18203/2394-6040.ijcmph20172836
14. Shrestha KD, KC T, Ghimire R. Predictors of Treatment Regimen Compliance and Glycemic Control among Diabetic Patients Attending in a Tertiary Level Hospital. Journal of Nepal Health Research Council. 2019 Nov 13; 17 (3):368-75. DOI https://doi.org/10.33314/jnhrc.v17i3.1786
15. Al-Qazaz HK, Sulaiman SA, Hassali MA, Shafie AA, Sundram S, Al-Nuri R, et al. Diabetes knowledge, medication adherence and glycemic control among patients with type 2 diabetes. Int. J. Clin. Pharm. 2011 Dec;33(6):1028-35 [link]
16. Okonta HI, Ogunbanjo GA, Ikombele JB. Knowledge, attitude and practice regarding lifestyle modification in type 2 diabetic patients. Afr. J. Prim. Health Care Fam. Med. 2014 Jan 1; 6(1):1-6. [link]
17. Shrestha N, Yadav SB, Joshi AM, Patel BD, Shrestha J, Bharkher DL. Diabetes knowledge and associated factors among diabetes patients in Central Nepal. Int. J. Collab. Res. Intern. Med. Public. 2015;7(5):82-91[link]
18. Upadhyay DK, Palaian S, Shankar PR, Mishra P, Pokhara N. Knowledge, attitude and practice about diabetes among diabetes patients in Western Nepal. Rawal Med J. 2008 Jan; 33(1):8-11. [link]