Diabetes Knowledge and Associated Factors among Diabetes Patients in Central Nepal

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Abstract

Background: Diabetes knowledge in patients with diabetes is a key factor to improve their quality of life and limit diabetic complications.

Aim & Objectives: This study aimed to assess the level of diabetes knowledge and associated factors among diabetes patients of Central Nepal.

Methods: A total of 132 patients with history of diabetes for more than three months were enrolled from the outpatient department of National Ayurveda Research and Training Center (NARTC) during the period from June 2014 to August 2014. A cross-sectional design was used to assess patients' level of knowledge and associated factors via interview-administered 24-item Diabetes Knowledge Questionnaire (DKQ).

Results: The participants mean age ± SD was 52.3 ± 11.19 years. Among the study participants 66.7% were male, 48.5% belonged to indigenous caste and 96.0% were married. In regards to education level, 30.3% of the participants had higher secondary or above education and 21.2% were illiterate. About one-fourth of the participants were housewife, 15.2% government employee and 12.1% were farmer. Participants with history of diabetes for 1-5 years were 48.5%, for more than 5 years were 30.3% and for less than 1 year were 21.2%. Among the diabetic patients, 51.5% reported to have family history of diabetes. The mean ± SD DKQ score of the respondents was 11.0 ± 3.32. Most commonly missed questions included role of diabetes in blood circulation, diabetic diet, signs of hypoglycaemia, hyperglycaemia, and importance of insulin in diabetes. A significant relationship existed between DKQ score and age, marital status, level of education, occupation, and patients with family history of diabetes.

Conclusion: Diabetes knowledge in diabetes patients was poor and associated with age, marital status, education level, occupation, and patients with family history of diabetes.

Background

Diabetes mellitus is emerging as an utmost public health concern in today's world.[1, 2] Globally, it affects more than 371 million people where more than 70.3 million are living in South Asia. Furthermore, South Asians have an increased propensity towards diabetes which is anticipated to rise to 120.9 million by 2030. Number of diabetes cases was found to be 506,727 in Nepal.[3] One study suggested that the prevalence of diagnosed diabetes in Nepal will rise to 15.11% and 17.49% in 2015 and 2020, respectively.[4]

The global escalation of diabetes is influenced by increasing ageing population, sedentary lifestyles, and unhealthy diets which are believed to triple the burden of disease in the next 25 years. Furthermore, insufficient diabetes education and poor self-care practices contribute to poor glycemic control and complications like diabetic nephropathy, diabetic retinopathy, diabetic neuropathy, etc.[5, 6] This alarming manifestation of diabetes is the result of demographic transition, coupled with industrialization and urbanization.[7] Additionally, those with poor understanding of the disease have shown increased rate of hospitalization for unstable diabetes.[8] On the contrary, patients with excellent knowledge and understanding of diabetes are able to adhere to the principles of self-care and have documented better glycemic control along with improved health outcomes.[9]

A study that measures the baseline knowledge of target population is the very first job to be performed for designing health education programs.[10] Moreover, such study is vital for the appropriate and efficient use of limited resources to address any health condition. To the best of our knowledge, only one study has been conducted regarding diabetes knowledge among diabetes patients in western Nepal.[11] Thus, this study aimed to assess the level of knowledge and associated factors about diabetes mellitus among diabetic patients of central Nepal.

Methods

A cross-sectional study was conducted among patients with diabetes attending the outpatient department of National Ayurveda Research and Training Center (NARTC) during the period of June 2014 to August 2014. Ethical approval was obtained from the Ethical review board of NARTC. The study population included people diagnosed with diabetes living in Kathmandu valley of central Nepal.

Convenient sample of 132 diagnosed diabetes patients, aged 18 years or older, and history of diabetes for 3 months or longer were included whereas those unable to communicate were excluded from the study.

A structured questionnaire formulated by extensive literature search was designed. The questionnaire consisted of two parts. First part was comprised of socio-demographic information and family history of diabetes. Second part included Diabetes Knowledge Questionnaire (DKQ) which is a 24-item test developed by the Starr County Texas, Diabetes Education Study.[12]

The questionnaire was piloted among 10 outpatient diabetes patients at NARTC to evaluate the suitability and coherence of content that guided to few modifications of the questionnaire. Face to face interview was taken to collect information from all the participants. The purpose of the study was explained and informed written consent was obtained from all literate

participants while verbal consent was obtained from illiterate participants. Privacy and confidentiality of the information was ensured to all the participants.

During data analysis, each knowledge question was scored 1 point for the correct answer and zero point for an incorrect or unknown response. Data were analyzed using SPSS version 18. Frequency, percentage, range, mean and standard deviation were used for descriptive statistics whereas test of significance were performed using independent sample *t*-test and one-way analysis of variance (ANOVA) to compare means among groups of different variables. All significance tests were two-tailed, *P* < 0.05 was considered statistically significant.

Results

Of the 132 participants, 66.7% were male, and 48.5% were of indigenous caste. The mean age ± SD of the participants was 52.3 ± 11.19 years (range 30-84 years), and majority of the respondents (97.0%) were married. Almost one-third (30.3%) had higher secondary or above education, 21.2% had secondary education, 27.3% had below secondary education, and 21.2% were illiterate. As for the variable occupation, business and housewife had the highest frequency i.e. 24.2% followed by government employee (15.2%) and the least being student (3.0%) as shown in Table 1.

Table 2 shows the clinical characteristics of the study participants. Among the diabetic participants, almost half of the participants (48.5%) had history of diabetes for 1-5 years, 30.3% for more than 5 years, and 21.2% for less than one year. Family history of diabetes was noted in 51.5 % of the study participants.

The knowledge distribution of the participants regarding diabetes is shown in Table 3. The mean ± SD DKQ score (out of a possible 24) of the respondents was 11.0 ± 3.32. Maximum number of participants (90.9%) believed that diabetes could damage their kidneys and cuts and abrasions on diabetics heal more slowly. Likewise, similar number of patients (87.9%) revealed that eating sugar and sweet foods is a cause of diabetes, blood sugar increases in untreated cases, and the way of preparing their food is as important as the foods they eat. More than two-third of the participants were well acquainted that diabetes is hereditary, incurable, cause loss of feelings in hands, fingers and feet, and extra care should be given while cutting toenails. Although 78.8% knew that blood sugar of 210 is high, more than 80.0% patients could not recognize the signs of hypoglycaemia and hyperglycaemia. Furthermore, less than one-third of the patients had knowledge about types of diabetes, role of insulin in diabetes, insulin reaction, diabetic diet, care of wound and importance of tight elastic hose or socks. None of the participants responded to question 14.

Table 4 shows the association between DKQ scores and different characteristics of the study participants. A significant relationship existed between DKQ score and age, marital status, level of education, occupation, and family history of diabetes of the participants. However, no significant difference was observed in DKQ score among gender, caste and years since diagnosis of diabetes of the study participants.

Discussion

Diabetes knowledge is vital in developing diabetes related healthful attitudes which enhance the self care skills of patients.[13] Moreover, the role of diabetes knowledge is to improve clinical outcomes and prevent complications.[14] The present study showed poor diabetes knowledge among diabetes patients in Nepalese adults as assessed by DKQ. A study conducted on Latino diabetes patients at Los Angeles County Hospital, using the same DKQ, also reported inadequate level of diabetes knowledge.[15] Similar types of findings were observed from the studies conducted among diabetes patients in western Nepal, urban area of South India, Karachi, United Arab Emirates and Kuwait.[11, 16-19] In contrast to the present findings, studies conducted in Andhra Pradesh (India), Sri Lanka and Malaysia showed satisfactory diabetes knowledge in diabetes patients.[20-22] Possibly, the coherence of our findings with that of western Nepal might be due to resemblance in the socio-demographic and behavioural characteristic of the participants in both studies. Apart from that, similarity in health care services in both the geographic regions could also impart same level of knowledge to the diabetic population. However, there is difficulty in comparing our findings with studies from other countries as there is disparity between the characteristics of the study population and study tools used in those studies.[16-22]

In this study, patients of younger age had significantly higher DKQ score than older patients. This finding is consistent with the results reported by Arora S et al. in Latino patients,[15] Al-Adsani A et al. in Kuwaiti patients [19] and Jasper US et al. in Nigerian diabetics.[23] Old age, with deteriorating cognitive function, is considered as a barrier to diabetes education whereas younger patients might have higher motivation and adaptability towards their disease.[24, 25]

Although marital status was significantly associated with knowledge as in Costa Ricans,[26] it could have been due to relatively small number of widowed participants.

Respondents of the present study, apart from lower secondary education group, showed better diabetes knowledge with higher level of education. This finding is congruent with Nigerian diabetics where those who never attended school scored lowest and those with tertiary education obtained highest score of diabetes knowledge. A better educated person may be more inquisitive while being counselled or educated on diabetes.[23] In addition, it is possible that educated patients could gather more information through different means of communication, i.e. radio, television, manual, magazine, etc. As regards to illiterate patients scoring higher than lower secondary educated patients, a probable reason may be the way researcher asked questions, which might have provided some clues to correct answer.

Occupation was significantly associated with knowledge in this study, with government and private employee, and business person scoring higher than others. This is almost in line with another study conducted in Nigerian diabetics. The plausible justification is that business person as well as the government and private employees are better educated and have greater contact with education materials.[23] Unlikely, housewife and student respondents obtained better and lesser score of DKQ, respectively. Our study could not identify the cause behind women acquiring higher DKQ score; hence, further studies are needed to assess the association between housewife and DKQ in Nepalese adults. Regarding student, as the proportion of student was negligible; this might have resulted in aberrant information. Also, our study showed that the family history of diabetes was positively associated with better knowledge of patient. This is also in accordance with the findings of other studies.[18, 19] A family member with chronic disease may be a source of information regarding the disease.[27]

The present study showed no significant association between gender and knowledge. Studies from Kuwait and Bangladesh also reported similar findings.[19, 28] There appears to be contradiction among different studies, some showing higher diabetes knowledge among male while the others female.[25, 29] Furthermore, the relationship between knowledge and years since diagnosis of diabetes in the study participants was not significantly associated. This is consistent with the finding of Jasper US et al.[23] However, other studies have found higher level of diabetes knowledge with increasing number of years of disease.[15, 19, 30]

There were some limitations noted in this study. First, it was carried out in a hospital setting at a single centre, so its findings may not be generalizable to the entire country. Second, the findings are based on self-reported data from participants which limits the validity of the data. Third, the sample size was fairly small so a larger sample size would surely impart more power to establish significant relationships between background characteristics and diabetes knowledge of patients.

Conclusions

In conclusion, the level of diabetes knowledge among diabetes patients in Nepalese adults was notably poor. Age, level of education, occupation, family history of diabetes and marital status were significantly associated with diabetes knowledge. So, further studies are warranted to develop need based awareness program targeting diabetes patients.

Abbreviations

NARTC: National Ayurveda Research and Training Center; DKQ: Diabetes Knowledge Questionnaire; SD: Standard Deviation; ANOVA: Analysis of Variance.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

Shrestha N conceived and designed the study. Shrestha N and Joshi AM carried out literature search, interpretation of data and drafted the manuscript. Yadav SB, Patel BDP, Shrestha J and Bharkher DL participated in study design and edited the manuscript. All authors have seen and approved the final manuscript.

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Table 1: Socio-demographic characteristics of the study participants (n = 132)

Variables	N (%)
Gender	
Male	88 (66.7)
Female	44 (33.3)
Caste/Ethnicity	
Brahmin	32 (24.2)
Chhetri	24 (18.2)
Indigenous	64 (48.5)
Madhesi	12 (9.1)
Age (years)	
≤ 40	12 (9.1)
41-50	56 (42.4)
51-60	40 (30.3)
≥ 61	12 (18.2)
Marital status	
Married	128 (97.0)
Widowed	4 (3.0)
Education level	
Illiterate	28 (21.2)
Below secondary	36 (27.3)
Secondary	28 (21.2)
Higher secondary or above	40 (30.3)
Occupation	
Government employee	20 (15.2)
Private employee	12 (9.1)
Business	32 (24.2)
Agriculture	16 (12.1)
Retired	16 (12.1)
Housewife	32 (24.2)
Student	4 (3.0)

Table 2: Clinical characteristics of the study participants (n = 132)

Variables	N (%)
Years since diabetes diagnosis	
< 1 year	28 (21.2)
1-5 years	64 (48.5)
> 5 years	40 (30.3)
Family history of diabetes	
Yes	68 (51.5)
No	64 (48.5)

Table 3: DKQ-24 results of the study participants

Item	Questions	N (%)*
1	Eating too much sugar and other sweet foods is a cause of diabetes.	116 (87.9)
2	The usual cause of diabetes is lack of effective insulin in the body.	40 (30.3)
3	Diabetes is caused by failure of the kidneys to keep sugar out of the urine.	4 (3.0)
4	Kidneys produce insulin.	36 (27.3)
5	In untreated diabetes, the amount of sugar in the blood usually increases.	116 (87.9)
6	If I am diabetic, my children have a higher chance of being diabetic.	104 (78.8)
7	Diabetes can be cured.	88 (66.7)
8	A fasting blood level of 210 is too high.	104 (78.8)
9	The best way to check my diabetes is by testing my urine.	72 (54.5)
10	Regular exercise will increase the need for insulin or other diabetic medicine.	28 (21.2)
11	There are two main types of diabetes: type 1 (insulin-dependent) and type 2 (non-insulin dependent).	12 (9.0)
12	An insulin reaction is caused by too much food.	8 (6.0)
13	Medication is more important than diet and exercise to control diabetes.	12 (9.0)
14	Diabetes often causes poor circulation.	0 (0.0)
15	Cuts and abrasions on diabetics heal more slowly.	120 (90.9)
16	Diabetics should take extra care when cutting their toenails.	104 (78.8)
17	A person with diabetes should cleanse a cut with iodine and alcohol.	40 (30.3)
18	The way I prepare my food is as important as the foods I eat.	116 (87.9)
19	Diabetes can damage my kidneys.	120 (90.9)
20	Diabetes can cause loss of feelings in my hands, fingers, and feet.	92 (69.7)
21	Shaking and sweating are signs of high blood sugar.	24 (18.2)
22	Frequent urination and thirst are signs of low blood sugar.	24 (18.2)
23	Tight elastic hose or socks are not bad for diabetics.	52 (39.4)
24	A diabetic diet consists mostly of special foods.	16 (12.1)

* answered correctly

Table 4: Association between characteristics of the study participants and DKQ Score

Variables	DKQ Score (mean ± SD)	*P*-value
Age (years)		
< 50	11.7 ± 3.45	
50−60	11.0 ± 3.23	
≥ 60	9.4 ± 2.77	<0.001*
Gender		
Male	10.7 ± 3.38	
Female	11.5 ± 3.21	0.24[+]
Caste		
Brahmin	10.9 ± 1.79	
Chhetri	12.3 ± 3.04	
Indigenous	10.6 ± 3.92	
Madhesi	10.7 ± 3.29	0.16*
Marital status		
Married	11.0 ± 3.37	
Widowed	9.0 ± 1.64	<0.001[+]
Education level		
Illiterate	10.7 ± 2.87	
Below secondary	8.9 ± 2.75	
Secondary	11.3 ± 3.76	
Higher secondary or above	13.0 ± 2.39	<0.001*
Occupation		
Government employee	12.8 ± 3.21	
Private employee	11.4 ± 2.74	
Business	11.1 ± 4.05	
Agriculture	8.5 ± 2.59	
Retired	10.5 ± 2.25	
Housewife	11.4 ± 3.00	
Student	8.0 ± 0.81	0.003*
Years since diabetes diagnosis		
< 1 year	10.0 ± 2.92	
1-5 years	10.8 ± 2.87	
> 5 years	11.5 ± 4.21	0.49*
Family history of diabetes		
Yes	11.6 ± 3.13	
No	10.3 ± 3.43	0.03[+]

* One-way ANOVA
[+] Independent sample *t*-test