Awareness regarding diabetes complications among patients with diabetes in a tertiary hospital

Devaka Kumari Acharya,[1] Binita Sigdel,[2] Anil Bhattarai[3]

ABSTRACT

INTRODUCTION

People with diabetes mellitus have a high risk of several serious health problems that increase healthcare costs, decrease life quality, and increase the death rate. The study aimed to assess the awareness regarding diabetes complications among patients with diabetes.

MATERIAL AND METHODS

A descriptive cross-sectional study was conducted in the Endocrine Outpatient Department of Tribhuvan University Teaching Hospital, Kathmandu, Nepal. A total of 101 patients diagnosed with diabetes were selected using purposive sampling. Data were collected through face-to-face interviews with structured interview questionnaires in the Outpatient Department before and or after medical checkups. Data were entered in SPSS version 20 and analyzed using descriptive statistics for frequency, percent, median, mean, and interquartile range, and inferential statistics Chi-square to measure the association between awareness of diabetes complications and sociodemographic and disease-related variables.

RESULTS

More than half (56.4%) of the respondents had an adequate level of awareness and more than two-fifths (43.6) of the respondents had an inadequate level of awareness on complications of diabetes. Awareness of complications of diabetes was significantly associated with duration of diabetes (p=0.05) and experience of diabetes complications (p=0.03).

CONCLUSION

This study concludes that nearly half of diabetic patients have inadequate awareness on complications of their disease. To decrease the onset of diabetes complications and financial burden to the patients and healthcare system and increase the patients' quality of life diabetes awareness programs are required to be conducted at the community and health institution level.

KEYWORDS

Awareness, Complications of diabetes, Diabetic patients

1. Maharajgunj Nursing Campus, Institute of Medicine, Tribhuvan University, Kathmandu, Nepal
2. Epidemiology and Disease Control Division, Nepal.
3. Manmohan Cardiothoracic Vascular and Transplant Center, Kathmandu, Nepal

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For Correspondence
Dr. Devaka Kumari Acharya
Maharajgunj Nursing Campus
Institute of Medicine
Tribhuvan University, Nepal
Email: devakaacharya11@gmail.com

INTRODUCTION

Diabetes is a chronic metabolic disease characterized by elevated levels of blood glucose.[1,2] Its an emerging epidemic and affects every nation, age group, and economy globally.[3] In 2017, an estimated 451 million people aged 18-99 years had diabetes and it was expected to be 693 million by 2045.[4] In Nepal, diabetes is emerging as a major healthcare problem with rising prevalence and its complications, especially in urban population.[5] Over time diabetes causes serious damage to the heart, blood vessels, eyes, kidneys, nerves[6] and causes cerebrovascular diseases and sudden death.[7]

Approximately half of diabetic patients have lack of disease awareness therefore are more prone to developing complications[3] and inadequate awareness is major challenge to managing diabetes in Nepal.[5] More knowledge on diabetic complications better adhere to the treatment.[8,9] The study aimed to assess the awareness regarding complications of diabetes among diabetes patients attending a tertiary hospital.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted in the Endocrine Outpatient Department of Tribhuvan University Teaching Hospital, Nepal among 101 patients diagnosed with Type 2 diabetes using a purposive sampling technique. Data was collected from January to February 2023 through face-to-face interviews using a structured questionnaire. Ethical approval was obtained from the Institutional Review Committee, Institute of Medicine (396[6-11] E2) and written permission was taken from the hospital. Informed written consent was obtained from participants after explaining the study's purpose. Data was collected from 8 AM to 12 MD on morning OPD and 1:30-4 PM on afternoon OPD at the corner before and or after doctor checkups. The average time for the interview was around 15-20 minutes. Inclusion criteria were sex both male and female, age 20 years and above, diagnosis of diabetes by an endocrinologist, duration of diabetes for at least 1 year before data collection, and willingness to participate. Respondents' dignity was maintained that their participation was voluntary and assured that they could withdraw from the study during the study if they wanted without any explanation. Collected data was edited, coded, and entered in Statistical Package for Social Science (SPSS version 20). Descriptive statistics were used to calculate mean, median, inter-quartile range, percentage, standard deviation. Inferential statistics Chi-square test was used to measure the association between awareness regarding complications of diabetes and demographic and disease-related variables.

RESULTS

Socio-demographic characteristics of the respondents reveals that more than half of the respondents (52.5%) were of age group of 40-59 years with a median age of 56, 54.5% were female and 79.2% were married. Regarding ethnicity, 56.4% were brahmin and chhetri and the least were madhesi 3%. In total, 31.7% of respondents can't read and write, only 8.9% have a bachelor's and above education, 37.6% were homemakers and 65.3% lived in urban areas.

Similarly, disease related information of the respondents shows that a higher number (32.7%) of respondents had more than 10 years of history of diabetes with a median duration of diagnosis of diabetes was 7 years, a minimum of 1 year, and a maximum of 25 years with the inter-quartile range of 7. Nearly half 49.5% of respondents' family members had diabetes. Likewise, 23.8% of respondents previously experienced the complications of diabetes and 36.6% respondents participated in diabetes counseling.

Table 1. Awareness on general information and management complications of diabetes (n=101)

Variables	Number	Percent
General information of diabetes		
Diabetes is a condition in which the blood sugar level is increased than the normal level	50	49.5
Normal fasting blood sugar 70-110mg/dl	49	48.5
Normal PP blood sugar less than 140mg/dl	36	35.6
Normal HbA1c <5.7%	6	5.9
Symptoms of hyperglycemia*		
Blurred vision	92	91.1
Increased hunger than before	90	89.1
Feeling thirsty more than often	90	90.1
Dehydration	75	74.3
Rapid heartbeat	61	60.4
Confusion and coma	51	50.5
Vomiting	36	35.6
Symptoms of hypoglycemia*		
Feeling weak	96	95.0
Feeling sleepy	92	91.1
Coordination problems	84	83.2
Sweating	82	81.2
Tremors	80	79.2
Being nervous and anxious	75	74.3
Irritability	73	72.3
Headache	65	64.4
Immediate management of hypoglycemic symptoms (Eating chocolates or sugary substances)	66	65.3

#Multiple responses

Table 1 depicts that nearly half (49.5%) of the respondents knew the meaning of diabetes mellitus and 48.5% knew normal fasting blood sugar levels. Slightly more than one-third (35.6%) of respondents knew about normal postprandial blood sugar levels and only 5.9% of respondents knew about the normal HbA1c level.

Regarding immediate complications of diabetes mellitus such as symptoms of hyperglycemia, more than 90% of the respondents knew about common symptoms of hyperglycemia like feeling tired (94.1%), more urination (92.1%), slow wound healing (92.1%) blurred vision (91.1%) and feeling thirsty (91.1%). Regarding symptoms of hypoglycemia, almost all (95.0%) respondents knew about feeling weak, 91.1% about feeling sleepy, and only 64.4% of respondents knew about headaches. Likewise, the majority (65.3%) of respondents mentioned eating

chocolates and sugary substances is the most appropriate way to improve hypoglycemic symptoms immediately.

Table 2. Awareness of late complications and factors associated with diabetes complications (n=101)

Variables	Number	Percent
Complications of diabetes*		
Eye problems	97	96.1
Kidney problems	92	91.1
Foot ulcers	80	79.2
Heart attack	77	76.2
Problem in nerves	75	74.3
hypertension	73	72.3
Stroke	66	65.3
Inflammation of gums, tooth loss	44	43.6
Factors associated with diabetes complications*		
Poor blood sugar control	95	94.1
Smoking	92	91.1
Alcohol intake	92	91.1
Overweight	92	91.1
Physical inactivity	87	86.1
Hypertension	80	79.2
High blood cholesterol	75	74.2

**Multiple responses*

Table 2 shows respondents' awareness on late complications and associated factors of diabetes. On complications, almost all (96.1%) respondents knew about eye problems, 91.1% knew about kidney problems and only 43.6% of respondents knew about inflammation of gums and tooth loss. Regarding factors associated with diabetes complications, the majority of respondents (94.1%) knew poor blood sugar control while 74.2% of respondents knew high blood cholesterol increases the occurrence of diabetes complications.

Table 3 Awareness of measures to delay diabetes complications (n=101)

Variables	Number	Percent
Measures to delay diabetes complications*		
Regular physical exercise	99	98.0
Maintaining normal body weight	96	95.0
Take regular anti-hyperglycemic medicines and insulin	95	94.1
Stress reduction	94	93.1
Cessation of alcohol and smoking	92	91.1
Calorie restricted diet	90	89.1
Screening test for early detection of complications*		
Renal function tests annually	94	93.1
Blood pressure and weight monitoring every 3 months	92	91.1
Eye examination annually	84	83.2
Blood cholesterol level annually	83	82.2
Foods that help to control blood sugar levels*		
Green vegetables	101	100.0
Whole grains	101	100.0
Protein diet eg: legumes, chicken, fish	96	95.0
Dairy products	94	93.1
Fruits	88	87.1
Unsaturated fats	83	82.2

**Multiple responses*

Table 3 reveals that almost all (98%) respondents mentioned regular physical exercise could delay complications of diabetes while 89.1% responded calorie-restricted diet. Similarly, about screening tests for early detection of diabetes complications, 93.1% of respondents said annual renal function tests, and 91.1% said about monitoring blood pressure and weight every three months. Cent percent of respondents identified eating green vegetables and whole grains helps to control blood sugar levels.

Table 4. Awareness on precautions during diabetic medications and exercise (n=101)

Variables	Number	Percent
Precautions while taking medicines and insulin*		
Take at recommended time and intervals	98	97.0
Don't miss meals and snacks	96	95.0
Be aware of any signs of hypoglycemia	81	80.2
Take a medic-alert card with self	41	40.6
Precautions while doing exercise*		
Avoid prolonged and strenuous exercise	61	60.4
Do exercise immediately after taking medicines and insulin	58	57.4
Should not perform exercise on an empty stomach	25	24.8
Don't know	28	27.7

**Multiple responses*

Table 4 depicts that 97.0% of respondents answered that medicines and insulin should be taken at the recommended time and intervals and 60.4% of respondents agreed that prolonged and strenuous exercise should be avoided by diabetic patients to prevent sudden decrease in blood sugar level.

Table 5. Level of awareness regarding complications of diabetes (n=101)

Level of awareness	Number	Percent	Mean score ± SD
Adequate awareness (≥mean)	57	56.4	47.42± SD 7.8
Inadequate awareness (<mean)	44	43.6	
Maximum possible right answers = 63			
Maximum obtained score = 59			
Minimum obtained score = 32			

Table 5 shows that more than half of the respondents (56.4%) had adequate awareness with a mean score of 47.42. The maximum possible score was 63; the maximum obtained score was 59 while the minimum obtained score was 32.

Table 6 Association between level of awareness and socio-demographic and disease related variables (n=101)

Variables	Level of awareness		Chi-Square value	p- value
	Adequate awareness No. (%)	Inadequate awareness No. (%)		
Age			0.60	0.437
20-39 years	5 (45.5)	6 (54.5)		
40 years and above	52 (57.8)	38 (42.2)		
Gender			0.67	0.411
Male	28 (60.9)	18 (39.1)		
Female	29 (52.7)	26 (47.3)		
Marital status			0.12	0.720
Married	45 (55.6)	36 (44.4)		

Single*	12 (60.0)	8 (40.0)		
Ethnicity			1.43	0.448
Brahmin/Chhetri	35 (61.4)	22 (38.6)		
Janjati	16 (48.5)	17 (51.5)		
Dalit and Madhesi	6 (54.5)	6 (45.5)		
Education				
Cannot read and write	14 (43.8)	18 (56.3)	3.06	0.080
Can read and write**	43 (62.3)	26 (37.7)		
Residence			0.11	0.917
Rural	20 (57.1)	15 (42.9)		
Urban	37 (56.1)	29 (43.9)		
Duration of diabetes			3.82	0.050
Less than 5 years	13 (41.9)	18 (58.1)		
5 years and above	44 (62.9)	26 (37.1)		
Family history of diabetes			0.99	0.754
No	28 (54.9)	23 (45.1)		
Yes	29 (58.0)	21 (42.0)		
Experienced complications of diabetes			4.41	0.036
No	39 (50.6)	38 (49.4)		
Yes	18 (75.0)	6 (25.0)		
Participation in diabetes counseling			0.61	0.433
No	38 (59.4)	26 (40.6)		
Yes	19 (51.4)	18 (48.6)		

*Unmarried, widowed, divorced
**Basic level, secondary level, bachelor and above

Table 6 shows that there was a statistically significant association between awareness of complications of diabetes with the respondents' previous experience of complications of diabetes (p= 0.03) and duration of diabetes (p= 0.05).

DISCUSSION

This study assessed the awareness of diabetes complications among 101 patients with diabetes. In the present study, 56.4% of respondents had adequate awareness regarding complications of diabetes. Different studies among diabetes patients had similar findings on knowledge and awareness of diabetes complications; study of Ethiopia 48.5% of patients had awareness of complications of diabetes[10] Saudi Arabia, 52.7% had adequate knowledge regarding diabetes complications,[11] Ghana 45.9% had adequate knowledge on diabetes complications.[12] A study from Nepal showed that 51% had an adequate level of knowledge on complications of diabetes.[13] This result is in contrast to the study of Ghana, where only 13.1% of respondents have adequate knowledge of complications[14,] and in Bangladesh, 14.8% of respondents had good knowledge of complications of diabetes.[15]

Regarding respondents' awareness of specific complications, the present study found that 96.1%, 91.1%, 79.2%, 76.2%, 74.3%, 72.3%, 65.3%, and 43.6% of respondents identified that diabetes could cause eye problems, kidney problems, foot ulcers, heart attack, problems in nerves, hypertension, stroke and inflammation of gums respectively. The present findings is similar to the study of Nepal where 95%, 81%, 76%, 72%, 68%, 38%, and 13% of respondents answered the loss of vision, hypertension, kidney failure, lower limb amputation, cardiac problems, stroke, and nerve damage.[15] This study's findings differ from the study of India where only 4%, 40%, 8%, 20%, and 30% of respondents knew that heart disease renal disease, retinopathy, stroke, and neuropathy respectively as the complications of diabetes.[16] Another study had different results on awareness: diabetic foot (51.5%), hypertension (35.4%), neuropathy (29.2%), hypoactive sexual arousal (25.4%), arousal disorder (21.5%), retinopathy (17.7%), heart disease (9.2%), and nephropathy (5.4%).[14]

The present study showed a significant association between awareness of diabetic complications with duration of diagnosis and previous experience of complications of diabetes. This finding is similar to the study from Nepal, duration of diabetes diagnosis has a significant association with knowledge of complications of diabetes.[17,18] Similar findings from a study of Ethiopia's duration of diabetes showed a significant association with good knowledge [19] and Ghana's duration of diabetes diagnosis is significantly associated with understanding the complications of diabetes.[14]

The current study findings do not show any significant association between awareness of diabetic complications and socio-demographic variables like age, sex, marital status, ethnicity, education, residence, and family history of diabetes. This study's finding is different from Ghana; female gender, rural residency, and educational level more than high school were significantly associated with the knowledge of diabetes complications but duration of diabetes and confirmed diabetic complication did not show an association.[14] In Ethiopia, respondents aged 30 above, male, having higher education, employment in NGO, and family history of diabetes were significantly associated with awareness of diabetic complications while duration of diabetes was not significantly associated.[10] Study from Nepal, diabetic patients who had a bachelor's and above level of education were positively associated with the level of knowledge on complications of diabetes. [20]

CONCLUSION

Nearly half of diabetes patients have inadequate awareness of the complications of diabetes. Awareness regarding complications of diabetes has a significant association with patients' duration of diabetes diagnosis and their previous experience with diabetes complications. For the reduction of life-threatening complications of diabetes and financial burden to the patients and healthcare system and to increase the patients' good quality of life there is an urgent need to increase the disease awareness among diabetes patients at community and health institution level.

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CONFLICT OF INTEREST

None

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