

Awareness Regarding Diabetes Mellitus among Clients Attending a Diabetes, Thyroid & Endocrinology Care Centre, Kupandole, Kathmandu

Pragya Shrestha,¹ Gita Neupane,² Priti Shakya³

¹Lecturer, Department of Nursing, Universal College of Medical Sciences, Rupandehi, Nepal

²Lecturer, Department of Nursing, Universal College of Medical Sciences, Rupandehi, Nepal

³Nursing Instructor, Kathmandu Institute of Technical Science (KITS) College of Nursing, Jwagal, Kupandole, Lalitpur, Nepal

ABSTRACT

Background: Diabetes mellitus is the most common non-communicable disease and has emerged as a major health issue globally. It is a group of metabolic disorders caused by high blood sugar in the blood. The awareness of patients about their illness is considered as an important factor in controlling blood sugar and preventing complications through self-care management. The objective of the study was to find out the level of awareness regarding diabetes mellitus among clients.

Methods: A descriptive cross-sectional study was conducted among 80 diabetic clients. The clients were selected by non-probability sampling technique. A semi-structured interview schedule was used to collect the data. It included the components of diabetes such as its meaning, risk factors, causes, clinical features, blood tests, complications, management, and preventive measures. Data were analyzed by using descriptive statistics with Statistical Package for Social Science (SPSS) version 20.0.

Results: Majority (76.25%) of the clients were in the age group of 55–79 years, and 51.25% were female. Most of the clients (81.25%) had a history of diabetes for 1–15 years since the diagnosis. Sixty percent had adequate awareness regarding diabetes mellitus.

Conclusion: Based on the findings, it is concluded that the awareness regarding diabetes among clients is inadequate. They have inadequate awareness of the causes of diabetes in terms of smoking, alcohol consumption, and advancing age. Unawareness of the causes leads to ignorance of preventive measures for diabetes and low quality of life among diabetic clients. So, an improved and well-structured continuing educational program for raising awareness of diabetes among diabetic clients is needed.

Keywords: Awareness, diabetes mellitus, clients, endocrinology centre.

INTRODUCTION

Diabetes is a major global epidemic and a non-communicable disease. It is a fatal cause of morbidity and mortality because of its complicated clinical consequences.¹ Immediate planning and implementation of health measures and individual interventions are to be sought to prevent the occurrence and complications of diabetes.² Diabetes mellitus has emerged as one of the most challenging public problems in the 21st century. Globally an estimated 422 million adults are living with diabetes mellitus. Diabetes has been rising more rapidly in middle and low-economic countries. In 2015, an estimated 1.6 million deaths were directly caused by diabetes. WHO projects that diabetes will be the seventh leading cause of death in 2030.³ In Nepal diabetes affects 15% of people

aged 20 years and older and affects 19% of aged 40 years and older people of urban areas. Diabetes shares 3% of total deaths at all ages. There were 10.5% of males and 7.9% of females affected by diabetes in 2016.⁴ The population-based survey in Nepal from 2016 to 2018 represented the prevalence of diabetes as 8.5%. The age group of 20-59 years was 78.8%, 42.2% were male and 57.9% were female. The male population had a higher prevalence compared to the female.⁵ The multiple chronic complications to eyes, kidneys, nerves, risk of heart disease, and stroke are caused by diabetes leading to rising morbidity and mortality. But patients need to be aware of diabetes, its risk factors, complications, and treatment to control the consequences through self-care in daily living.⁶

Diabetes mellitus is a controllable disease by raising

Article information		
Received: 6 March 2023	Accepted: 10 August 2023	Published online: 30 August 2023
<p>Copyright © 2023 by the author(s), wherein the author(s) are the only owners of the copyright of the published content</p> <p>Licensing: This published content is distributed under the terms of the Creative Commons Attribution International License (CC BY 4.0) license, and is free to access on the Journal's website. The author(s) retain ownership of the copyrights and publishing rights without limitations for their content, and they grant others permission to copy, use, print, share, modify, and distribute the article's content even for commercial purposes.</p> <p>Disclaimer: This publication's claims, opinions, and information are the sole creations of the specific author(s) and contributor(s). Errors in the contents and any repercussions resulting from the use of the information included within are not the responsibility of the publisher, editor, or reviewers. Regarding any jurisdictional assertions in any published articles, their contents, and the author's institutional affiliations, the Journal and its publisher maintain their objectivity.</p>		

awareness among patients. People with diabetes can be aware from education on its risk factors, diagnosis, medication, diet, and physical exercise. This education program needs baseline information on people's knowledge of diabetes for planning awareness. But only a few studies have been conducted to identify the awareness of diabetes among patients.⁶ So, this study helps to get information on areas of low knowledge on diabetes among patients.

METHODS

A descriptive cross-sectional study was conducted among diabetic clients in the Diabetes, Thyroid, & Endocrinology Care Centre (DTECC), Kupandole, Lalitpur Metropolitan City-10, Lalitpur. The non-probability purposive sampling method was used. Clients diagnosed with type II diabetes, who registered and attended the DTECC on time, were interviewed for the study. The sample was calculated by using Slovin's (Sample size $(n) = N / (1 + N(e)^2)$).⁸ Taking the margin of error 0.1, and the total population being 400, calculated sample size was 80. Ethical approval was obtained from the Institutional Review Committee of Universal College of Medical Sciences-Teaching Hospital. Administrative approval was obtained from DTECC. The data were collected using a semi-structured face-to-face interview schedule. The schedule was developed by the researchers themselves through an in-depth literature search.^{1,2,9-11} It consisted of two parts. Part I was related to the socio-demographic characteristics of patients and part II consisted of 21 questions related to awareness regarding diabetes mellitus. The English questionnaire was translated into Nepali language and a back translation was done. A pretest of the instrument was done among 10% of the sample size in the medical outpatient department of Universal College of Medical Sciences Teaching Hospital, Bhairahawa, Nepal. The average awareness of diabetes was 16.77. Adequate awareness was referred to ≥ 16.77 and inadequate awareness was referred to < 16.77 .

The interview was done after obtaining written informed consent from each patient and clarifying the objective of the study. They were informed that they could discontinue as they wish. They were also assured of confidentiality by not disclosing their information and used only for study purposes. They were interviewed in a separate place alone. The data was collected from 12 August to 12 October 2018. The data were analyzed using descriptive statistics (frequency, percentage, and mean) with SPSS software version 20.0. The findings were presented in tables.

RESULTS

The results of the study were found on the basis of data from diabetic patients in DTECC. Total sample was 80. It was found that 76.25% of clients were in the 55–79 age group, and 23.75% were in the 30–54 age group. More than half of the clients (51.25%) were female. The vast majority of clients (87.5%) were literate, 51.25% were service holders, and 48.75% were self-employed. The majority of clients (81.25%) had 1–15 years and 18.75% had 16–30 years as the duration of the disease; 57.50% had a family history of diabetes mellitus; and 61.25% had co-morbidities. Among them, 71.42% of clients had high blood pressure, 14.28% had hypothyroidism, 10.20% had hyperlipidemia, 4.08% had arthritis, and 36.25% got information about diabetes mellitus from health personnel. (Table 1)

The majority of clients (98.75%) responded that

Table 1: Socio-demographic Characteristics.

Variables	Frequency	Percentage
Age in years		
30-54	19	23.75
55-79	61	76.25
Sex		
Male	39	48.75
Female	41	51.25
Education status		
Literate	70	87.50
Illiterate	10	12.50
Occupation		
Service holder (government and private)	41	51.25
Self-employed (Business & Homemaker)	39	48.75
Duration of Diagnosis		
1-15	65	81.25
16-30	15	18.75
Having family history	46	57.50
Having co-morbidities	49	61.25
If yes (n=49) Multiple Responses		
High blood pressure	35	71.42
Hypothyroidism	7	14.28
Hyperlipidemia	5	10.20
Arthritis	2	4.08
Sources of information		
Health personnel	29	36.25
Other than health personnel (family members and friends)	51	63.75

high blood sugar in the blood was the meaning of diabetes mellitus. Regarding the risk factors of diabetes mellitus, most clients (86.25%) responded obesity, 82.50% responded family history, 77.50% responded insufficient exercise, 53.75% responded alcohol consumption, 50% responded smoking, and 48.75% responded advancing age.

Regarding the causes of diabetes mellitus, more than half (76.25%) of clients responded to insufficient production of insulin in the body, 30% responded body fails to respond to insulin, and 15% responded to injury to the pancreas. Regarding major features of diabetes mellitus, 100% of clients responded to excessive urination, 92.5% responded to excessive thirst, 91.25% responded to excessive hunger, 76.25% responded to fatigue, and

57.5% responded to weight loss. Regarding blood tests for diabetes mellitus, the majority of clients (90%) responded to fasting blood sugar (FBS) and post-prandial blood sugar (PPBS), and 20% responded to random blood sugar (RBS), and glycated hemoglobin test (HbA1c). (Table 2)

Table 2: Awareness Regarding Meaning, Risk Factors, Causes, Features, and Blood Tests of Diabetes Mellitus (multiple responses)

Variables	Frequency	Percentage
Meaning		
High blood sugar in the blood	79	98.75
Risk factors		
Obesity	69	86.25
Family history	66	82.50
Insufficient exercise	62	77.50
Alcohol consumption	43	53.75
Causes		
Insufficient production of insulin	61	76.25
Body fails to respond to insulin	24	30.00
Injury to pancreas	12	15.00
Major features		
Excessive urination	80	100.00
Excessive thirst	74	92.50
Excessive hunger	73	91.25
Fatigue	61	76.25
Weight loss	46	57.50
Blood Tests		
Fasting blood sugar (FBS)	72	90.00
Post prandial blood sugar (PPBS)	72	90.00
Random blood sugar (RBS)	16	20.00
Glycated hemoglobin test (HbA1c)	16	20.00

Regarding complications of diabetes, the majority of clients (97.50%) responded to eye problems, 87.50% responded to kidney problems, 83.75% responded to delay wound healing, 53.75% responded to high blood pressure, 46.25% responded to foot problems, 8.75% responded to the loss of sensation in hands and/or feet. Regarding the management of diabetes mellitus, 100% of clients responded to dietary modification, oral hypoglycemic medicine, and regular follow-up, 85% responded to brisk walking, 80% responded to injection insulin, and 96.25% responded to regular blood sugar monitoring. Regarding preventive measures for diabetes mellitus, the majority of clients (98.70%) responded to

weight reduction, 96.25% responded to yoga and quitting smoking and alcohol intake, 92.50% responded to a low carbohydrate, low-fat diet and avoiding sweets, and 42.50% responded to exercise for 30 minutes. (Table 3)

Table 3: Awareness Regarding Complications, Management, and preventive measures for Diabetes Mellitus (Multiple Responses)

Variables	Frequency	Percentage
Complications of diabetes mellitus		
Eye problems	78	97.50
Kidney problems	70	87.50
Delay wound healing	67	83.75
High blood pressure	43	53.75
Foot problems	37	46.25
Loss of sensation of hands and/or feet	7	8.75
Management for diabetes mellitus		
Dietary modification	80	100.00
Oral hypoglycemic medicine	80	100.00
Regular follow up	80	100.00
Regular blood sugar monitoring	77	96.25
Low carbohydrate, low fat diet and avoid sweets	74	92.50
Brisk walking	68	85.00
Injection Insulin	64	80.00
Preventive measures for diabetes mellitus		
Weight reduction	79	98.70
Yoga	77	96.25
Quit smoking and alcohol intake	77	96.25
Avoiding excessive intake of sugar/sweets	46	57.50
Daily exercise for 30 minutes	34	42.50

Regarding awareness of diabetes mellitus, more than half (60%) of clients had adequate awareness and 40% had inadequate awareness. (Table 4)

Table 4: Level of Awareness Regarding Diabetes Mellitus. (n=80)

Variables	Frequency	Percentage
Adequate (≥16.77)	48	60.00
Inadequate (<16.77)	32	40.00

DISCUSSION

The study showed that almost all the clients were aware that high blood sugar in the blood was the meaning of diabetes mellitus. The finding was in contrast to the study conducted in Twin, Pakistan, which shows that 35% were aware that they had high blood sugar.¹² Regarding

the risk factors of diabetes mellitus, the study showed that 86.25% were aware of obesity. The finding was in contrast to the study conducted in Puducherry, India which shows that 53.84% were aware of obesity.¹³ The study showed that 77.5% were aware of insufficient exercise and 48.75% were aware of advancing age. The finding was consistent with the study in Dhaka, Bangladesh which shows 73% were aware of insufficient exercise but the finding of advancing age was in contrast to the same study which shows 69% were aware of advancing age.¹⁴ The study showed that 50% and 53.75% were aware of smoking and alcohol consumption respectively. The findings were in contrast with the study conducted in Kathmandu, Nepal which shows 9.80% and 16% were aware of smoking and alcohol consumption respectively.¹⁵ The study showed that 82.50% were aware of family history. The finding was consistent with the study conducted in Gambia, West Africa which shows that 80% were aware of family history.¹⁶

Regarding the causes of diabetes mellitus, the study showed that 76.25% were aware of insufficient production of insulin in the body. The finding was consistent with the study conducted in Riyadh, Saudi Arabia which shows that 76.50% were aware.¹⁷ The study showed that 30% were aware of the failure of the body to respond to insulin. The finding was in contrast with the study conducted in Puducherry, India which shows that only 9.61% were aware.⁹ The study showed that 15% were aware of the injury to the pancreas. The finding was in contrast with the study conducted in Sri Lanka which shows that 40.46% were aware.¹⁸ Regarding the major features of diabetes mellitus, the study showed that 91.25%, 100%, and 92.50% were aware of excessive hunger, excessive urination, and excessive thirst respectively. The findings were in contrast with the study conducted in Southwest, Iran which shows that 12%, 81%, and 7% were aware respectively.¹⁹

The findings of the study showed that 100% were aware of blood tests as a diagnostic test for diabetes mellitus. The finding was in contrast with the study conducted in West Bengal, India which shows that 91.20% were aware.²⁰ The study also showed that 90% were aware of fasting blood sugar and post-prandial blood sugar and 20% were aware of random blood sugar and glycated hemoglobin (HbA1c) tests as blood tests to diagnose diabetes mellitus.

Regarding the complications of diabetes mellitus, the study showed that 97.50%, 87.50%, and 53.75%, were aware of eye problems, kidney problems, and high blood pressure respectively. The findings were consistent with the study conducted in Kathmandu, Nepal which shows 95% were aware of eye problems. The results of the same study were in contrast to awareness regarding kidney problems and high blood pressure that shows, 76%, and 81% respectively.²¹

Regarding the management of diabetes, the study showed that 100% and 80% were aware of oral hypoglycemic medicine and insulin respectively which was in contrast to the study conducted in South Africa which shows that 80.70% and 9.90% were aware respectively. The study showed that 100% and 85% were aware of dietary modification and regular exercise respectively which was in contrast to the study conducted in India which shows that 66.34% and 49.03% were aware respectively. The study showed that 100% and 96.25% were aware of regular follow-up and regular blood sugar monitoring respectively. The finding of up follow-up was in contrast

and the sugar monitoring was consistent with the study conducted in India which shows 53.50% and 95.30% were aware respectively.^{9,12,22} The findings of the study showed that 92.5% of respondents were aware of low carbohydrate, low-fat diet and avoid sweets as types of a diabetic diet.

Regarding preventive measures for diabetes, the study showed that 57.50% were aware of avoiding excessive intake of sugar/sweets which was in contrast with the study conducted in India which shows 66.24% were aware. The study showed that 42.50% were aware of daily exercise for 30 minutes which was consistent with the study conducted in Bangladesh which shows 45.50% were aware.^{12,20} The study showed that 98.70%, 96.25%, and 96.25% were aware of body weight reduction, yoga, and quitting smoking and alcohol intake respectively as preventive measures for diabetes mellitus.

Limitation: The study was conducted at DTECC, Kupandole, Lalitpur. The study population was limited to 80 diabetic clients under treatment. Therefore, the findings cannot be generalized to other settings due to the small sample size.

CONCLUSION

This study indicated that the majority of clients were aware of the most of the areas of awareness of diabetes. They are aware of high blood sugar for diagnosing diabetes with a test of fasting blood sugar but have low awareness of the HbA1c test. They are aware of dietary and lifestyle modifications to control diabetes, but awareness of exercise is low. The low awareness of foot problems as a complication may lead to decreased health quality for clients. Therefore, an innovative and well-structured public awareness program for patients should be instituted to address the importance of exercise and foot care for diabetes.

ACKNOWLEDGMENT

The authors express their sincere gratitude to Diabetes, Thyroid, & Endocrinology Care Centre (DTECC), Kupandole, Lalitpur Metropolitan City-10, Lalitpur. We also extend our gratitude to all clients of DTECC for their cooperation and valuable information.

Conflict of interest: Authors declare no conflict of interest.

Source of funding/support: Authors received no external support.

REFERENCES

1. Iqbal T. Awareness about diabetes mellitus amongst diabetics. *Journal of Rawalpindi Medical College*. 2013 Dec 30;17(2):294-6. <https://bmjopen.bmj.com/content/bmjopen/12/2/e060750.full.pdf> [Google scholar]
2. Gyawali B, Hansen MR, Povlsen MB, Neupane D, Andersen PK, McLachlan CS, Sandbæk A, Vaidya A, Kallestrup P. Awareness, prevalence, treatment, and control of type 2 diabetes in a semi-urban area of Nepal: Findings from a cross-sectional study conducted as a part of COBIN-D trial. *PLoS One*. 2018 Nov 2;13(11):e0206491. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0206491> [Google scholar]
3. World Health Organization. *World Health Organization Global Report on Diabetes*. Geneva: World Health Organization. 2016. <https://www.who.int/publications/i/item/9789241565257> [Weblink]
4. Singla A, Sharma T, Kaeley N. Awareness of diabetic

- patients towards diabetes mellitus: A survey based study. National Journal of Community Medicine. 2017 Oct 31;8(10):606-10. <https://njcmindia.com/index.php/file/article/view/1429> [Google scholar]
5. Shrestha N, Karki K, Poudyal A, Aryal KK, Mahato NK, Gautam N, Dirghayu KC, Gyanwali P, Dhimal M, Jha AK. Prevalence of diabetes mellitus and associated risk factors in Nepal: findings from a nationwide population-based survey. *BMJ open*. 2022 Feb 1;12(2):e060750. <https://bmjopen.bmj.com/content/bmjopen/12/2/e060750.full.pdf> [Google scholar]
 6. Mirghani HO, Hamdi NH, Almarhapi SA, Hamdi NH, Alshehri RA. Awareness of General Population Regarding Diabetes Mellitus Diseases among Tabuk, KSA.
 7. Gyawali B, Ferrario A, Van Teijlingen E, Kallestrup P. Challenges in diabetes mellitus type 2 management in Nepal: a literature review. *Global health action*. 2016 Dec 1;9(1):31704. <https://www.tandfonline.com/doi/full/10.3402/gha.v9.31704?scroll=top&needAccess=true&role=tab> [Google scholar]
 8. Kothari CR. Research methodology method and technique. 2nd ed. New Delhi, India: New Age International Private Limited; 2011. p. 146-48.
 9. Ntontolo PN, Lukanu PN, Ogunbanjo GA, Fina JP, Kintaudi LN. Knowledge of type 2 diabetic patients about their condition in Kimpese Hospital diabetic clinic, Democratic Republic of the Congo. *African journal of primary health care & family medicine*. 2017;9(1):1-7. <https://journals.co.za/doi/epdf/10.4102/phcfm.v9i1.1385> [Google scholar]
 10. Kazi RN, Bote MM, Raikar KJ. Knowledge, attitude and practices about diabetes mellitus and its complications in T2DM patients attending the UHC in Mumbai. *International Journal of Community Medicine and Public Health*. 2017 Aug;4(8):2793.
 11. Moodley LM, Rambirth V. An assessment of the level of knowledge of diabetic patients, in a primary health care setting, on diabetes mellitus. *South African Family Practice*. 2007;49(10). <https://www.ajol.info/index.php/safp/article/view/13416> [Google scholar]
 12. Kanwal S, Malik TA, Noman M, Rehman A, Riaz M, Abdur-Rehman H, Bilal Shah SM. A Cross-sectional Study Assessing Knowledge Attitude and Practice of Diabetic Patients at Tertiary Care Hospitals of Twin of Pakistan. *J App Pharm*. 2015;8(210):2. <https://www.longdom.org/open-access/ldquo---crosssectional-study-assessing-knowledge-attitude-and-practice-of-diabetic---patients-at-tertiary-care-hospital-12943.html> [Web link]
 13. Benil V, Dheepan NB. Awareness and knowledge of diabetes mellitus among diabetic patients in Puducherry, India. *International Journal of Basic & Clinical Pharmacology*. 2017 May;6(5):1211-4.
 14. Mumu SJ, Saleh F, Ara F, Haque MR, Ali L. Awareness regarding risk factors of type 2 diabetes among individuals attending a tertiary-care hospital in Bangladesh: a cross-sectional study. *BMC research notes*. 2014 Dec 1;7(1):599. <https://link.springer.com/article/10.1186/1756-0500-7-599> [Google scholar]
 15. Gautam A, Bhatta DN, Aryal UR. Diabetes related health knowledge, attitude and practice among diabetic patients in Nepal. *BMC endocrine disorders*. 2015 Dec;15(1):25. <https://bmcendocrdisord.biomedcentral.com/articles/10.1186/s12902-015-0021-6> [Google scholar]
 16. Foma MA, Saidu Y, Omoleke SA, Jafali J. Awareness of diabetes mellitus among diabetic patients in the Gambia: a strong case for health education and promotion. *BMC public health*. 2013 Dec;13(1):1124. <https://bmcpublihealth.biomedcentral.com/articles/10.1186/1471-2458-13-1124> [Google scholar]
 17. Salem SS, Al-Rwaili MG, Alabdian NS. Awareness regarding diabetes mellitus' risk factors and preventive measures among Saudi adult population in Riyadh. <http://iosrjournals.org/iosr-jnhs/papers/vol6-issue6/Version-3/C0606032531.pdf> [Web link]
 18. Jayawickrama W, Perera K. Knowledge, awareness and attitudes towards the management of diabetes mellitus among patients in Sri Lankan suburban community. *Sri Lanka Journal of Diabetes Endocrinology and Metabolism*. 2016 Aug 29;6(2).
 19. 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 Jan 1;3(4):520-4.
 20. Koley M, Saha S, Arya JS, Choubey G, Ghosh S, Chattopadhyay R, Das KD, Ghosh A, Hait H, Mukherjee R, Banerjee T. Knowledge, Attitude, and Practice Related to Diabetes Mellitus Among Diabetics and Nondiabetics Visiting Homeopathic Hospitals in West Bengal, India. *Journal of evidence-based complementary & alternative medicine*. 2015 Jan;21(1):39-47. <https://journals.sagepub.com/doi/full/10.1177/2156587215593656> [Web link]
 21. Paneru N, Adhikari RD. Knowledge regarding diabetic complications among diabetic clients attending outpatient department in a tertiary hospital, Kathmandu. *Journal of Diabetes and Endocrinology*. 2019 Jan 31;10(1):1-7. <https://academicjournals.org/journal/JDE/article-full-text/952038759933> [Google scholar]
 22. Durgad A, Ramesh KN, Dhananjaya M, Parakh RB. Awareness of diabetes mellitus and its complications among patients at tertiary care hospital. http://www.ijss-sn.com/uploads/2/0/1/5/20153321/ijss_apr_oa24.pdf [Web link]