Self-Care Practices among Diabetic Patients in Selected Sub-Metropolitan Cities of Nepal

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Author's contribution

This work was carried out in collaboration among all authors. The author SK, SP and PRS designed, analysed, interpreted and prepared the manuscript. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: Diabetes self-care requires a multipronged approach, wherein the diabetic patient has a significant role to play. This study was undertaken to explore self-care practices of diabetic patients residing in two sub-metropolitan cities of Nepal.
Study Design: A cross-sectional comparative study.
Place and Duration of Study: The study was carried out from March 2019 to June 2020.
Methodology: An analytical cross-sectional study was done among 415 diabetic patients aged above 25 years. A simple random sampling technique was used to select the study participants. A structured questionnaire was adopted and making necessary contextual to collect the data. Descriptive statistics along with association between means, t-tests and ANOVA were calculated and a $p < 0.05$ was considered significant for data analysis.
Results: Regarding the diabetes self-care activities in different domains with respect to sociodemographic independent variables, blood sugar testing and foot care was a statistically significant associated with education i.e. (p= 0.018) and (p=0.003) simultaneously. The study also

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reveals that specific diet, physical activity/exercise and blood sugar testing are significantly associated with HbA1c of diabetic patients. i.e. (p=0.003), (p=0.004) and (p=0.037) respectively.
Conclusion: The general awareness regarding both general and specific diet, physical activity/exercise, blood sugar testing, foot care and medications were poor in our study. More strategies need to be explored to make sure patients adhere to self-care activities.

Keywords: Diabetes care; HbA1c; self-management; self-care practices.

1. INTRODUCTION

Diabetes among elder adults is anticipated to rise exponentially over the following decades. This rise may be particularly pronounced in Nepal because of its large older adult population. The Nepalese health care system is struggling to provide all-inclusive services and quality treatment for diabetes patients at all levels of health care [1]. Research must begin to evaluate the barriers that may keep older adults from receiving recommended care [2-4]. Diabetes self-care activities such as diet, exercise, foot care, and self-glucose monitoring are considered a cornerstone to good diabetes care [5-7]. Unfortunately, health professional driven health care system, and the providers have not delivered self-management activities as frequently as more clinical aspects of diabetes care and adherence is low [1,8,9]. Patients with low adherence to self-care activities such as exercise and medication were found to have lower Health-Related Quality of Life [10]. Various factors: such as age, sex, educational level, social support, presence of complication and comorbidities, and economic status of individuals seemed to influence self-care practices [8].

There are some principles established to be effective in diabetes management: healthy eating, monitoring, being active, taking medication, problem-solving, healthy coping, and reducing risks [5]. Among them, physical activity, dietary intake, adherence to medications, and periodic health checkups are usually assessed in the household or primary care settings to know about self-care practices of diabetes [5].

Self-care practices are defined as the set of behaviours practiced by people with or at risk of diabetes in order to successfully manage the disease on their own. Studies showed that these practices are found to have an association with good glycemic control [7,11]. There is inadequate work regarding knowledge and self-care behaviours related to diabetes mellitus in Nepal. Research studies to provide evidence for these factors are remarkable for the prevention and control of diabetes and other non-communicable diseases and to inform policies and strategies in such resource meager countries. Thus, the objective of this study was to assess the baseline knowledge and self-care behavioral practices regarding diabetes so that it will serve as a benchmark for future comparisons to assess the effectiveness of any educational training program for diabetic patients.

2. MATERIALS AND METHODS

An analytical cross-sectional study was conducted in a selected two sub-metropolitan city of Nepal from March 2019 to June 2020 to find the self-care practices among diabetic patients. A simple random sampling technique was used to select the study population.

2.1 Study Population

To participate in the study interview, patients had to be >25 years of age, diagnosed with Type 2 Diabetes Mellitus (T2DM) for >1 year, should be able to speak and understand Nepali and should not be suffering from terminal illness and cognitive impairment.

The list and the full address of the participants were gathered from the record books of different health institutions. After having the full list of diabetes mellitus patient, considering the inclusion criteria, they were assigned the number. From this free list study participants were randomly selected by using lottery method.

2.2 Sample Size

The sample size was calculated by using the Cochran's formula N= z^2pq /e^2 with the desired precision of 5% i.e. the margin of error (95% confident interval). N =sample size, z =confident level (the standard deviation set for 95% CI) =1.96, absolute allowable error e =0.05%, p is the estimated proportion of the of the population which has the attribute in question, q is 1-p The calculation of required sample size was as follows: p=0.5, hence q= 1-p =1-.0.5=0. e = 0.05,

$z=1.96$ $N=z^2pq/e^2$ = $(1.96)^2$ (0.5) (0.5) / $(0.05)^2$ =3.8418x 0.25/0.0025 =384.16. Now, considering a 10% non-response rate, the sample size was 415.

2.3 Study Tools

The patients' demographic characteristics, such as age (years), gender, education, family history of diabetes, duration of diabetes, nature of glycemic agents and lab data, were collected on the patients' demographic and lab data collection form. Patients' diabetes-related self-care activities were measured by using the Nepali version of Diabetes Self-Management Questionnaire (DSMQ). The tool was designed to examine the association of diabetes patients' self-care activities with their glycemic control. By using DSMQ, a trained health assistant conducted face to face interview during household survey. After the interview all the participants were invited at health institution to have a blood test in the laboratory.

2.4 Data Analysis

All the collected data were coded and entered into SPSS version 21.0 and analyzed by employing a variety of descriptive and inferential statistics. Continuous variables such as frequency, percentage, mean, standard deviation, minimum and maximum were described; and categorical as frequency and percentage. The Kolmorov Smirnov test was used to assess the normal distribution of the sample. In order to verify the association between means, t-tests and ANOVA were used. We considered as statistically significant for all statistical analyzes those with p <0.05.

3. RESULTS AND DISCUSSION

The majority 32.8% of diabetic patients were in the age group of 50–59 years, 57.3% were male, 80% of Hindus, 36.4% of advantage *Janajatis*, 33% Lower secondary (grade 6-8), 64.1% of married and 29.6% of patients were doing business (Table 1).

Around 40(9.6%) of the study participants did not practice did you inspect the inside of their shoes for foot care for even a single day in the past 1 week. A maximum foot care score of 7 was present in only 130(31.3%) participants. The study depicts that 254(61.2%) of the study participants had a maximum score of 7 for taking

a recommended medication last for seven days followed by 116(28.0%) for 6 days in the last 1 week. Similarly, 107(25.8%) of patients did not take their recommended insulin injections. Only 9% of the study participants practiced physical activity on all 7 days in the last 1 week, while 39.3% of the study participants did not practice physical activity even for a single day. Out of all subjects, 136(32.8%) did not practice blood sugar testing at all in the last 1 week. 64(15.4%) of the participants didn't participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work. Only 9(2.2%) of the participants eat five or more servings of fruits and vegetables in the last seven days as a specific diet (Table 2).

Regarding the Diabetes self-care activities in different domains with respect to sociodemographic independent variables, there was a statistically significant association between Blood Sugar Testing, foot care and education i.e. (P = 0.018) and (p=0.003) simultaneously (Table 3).

The study reveals that specific diet, physical activity/exercise and blood sugar testing is significantly associated with HbA1c of diabetic patients. i.e. (p=0.003), (p=0.004) and (p=0.037) respectively. (Table 4)

Self-care activities regarding both general and specific diet, physical activity/exercise, blood sugar, testing, foot care and medications were poor in our study. These differences may be due to varying awareness levels and cultural diversities among these population groups [4,12]. We noted that females in Sub metropolitan level generally felt shy going for exercise if they were alone or their husbands did not permit them to go for exercise. Male diabetic patients attributed to lack of time as the main reason for not doing exercise. Blood sugar testing was the most lacking self-care activity among diabetic patients in our study. Foot care practices were also lacking exceptionally among the study participants.

Many of our study participants responded that their diet depended on meals cooked in the family [8]. Dependence on own funds and being diagnosed from a private hospital also negatively affected general diet self-care in diabetic patients [1,10]. Diabetes being a chronic disease, its lifelong treatment and diet entail a substantial expenditure [2,3] Thus if patients had to use their own funds for treatment, they generally found it

difficult to purchase such food items as were recommended for good dietary practices, for example, fruits and vegetables whose costs at times could be pretty high. It has been commonly observed that physicians in private practice and in private hospitals lay more emphasis on curative rather than on preventive aspects of management [3]. This might be a reason for the reduced general diet self-care practices observed in our study participants.

Table 1. Sociodemographic characteristics (N=415)

Variables	Frequency	Percent
Sex of the Participant		
Male	238	57.3
Female	177	42.7
Age group		
Less than 30	20	4.8
30-39	26	6.3
40-49	66	15.9
50-59	136	32.8
60-69	101	24.3
70 and above	66	15.9
Religion		
Hindu	332	80.0
Buddhist	46	11.1
Christian	11	2.7
Muslim	10	2.4
No religion	16	3.9
Ethnic background		
Dalit	32	7.7
Disadvantaged Janatatis	48	11.6
Disadvantaged non-dalit Terai group (except Terai Brahmin)	32	7.7
Religious minorities	16	3.9
Advantaged Janajatis	151	36.4
Upper Caste	136	32.8
Highest level of education		
Informal education	81	19.5
No schooling	36	8.7
Primary (grade 1-5)	57	13.7
Lower secondary (grade 6-8)	137	33.0
Secondary (grade 9-10)	27	6.5
Higher secondary (grade 11-12)	54	13.0
Graduate and above (Bachelors and above)	23	5.5
Marital status		
Single	49	11.8
Married	266	64.1
Widowed	34	8.2
Divorced	17	4.1
Separated	33	8.0
De-facto/ cohabitating	16	3.9
Occupation		
Salaried job	43	10.4
Business	123	29.6
Wage-based labour	39	9.4
Small-informal business	68	16.4
Agricultural work	58	14.0
Housewife/househusband	21	5.1
Student	10	2.4
Retired	45	10.8
Others	8	1.9

Table 2. Status of diabetes self-care activities

Self-care activities	Number of days in a week(n)							
	0 **f(p)**	**1** **f(p)**	**2** **f(p)**	**3** **f(p)**	**4** **f(p)**	**5** **f(p)**	**6** **f(p)**	**7** **f(p)**
General diet								
Following healthful eating plan within SEVEN DAYS	0(0)	46(11.1)	135(32.5)	108(26.0)	81(19.5)	27(6.5)	9(2.2)	9(2.2)
Following your eating plan (DAYS PER WEEK over the past month)	0(0)	18(4.3)	127(30.6)	184(44.3)	67(16.1)	12(2.9)	7(1.7)	0(0)
Specific diet (in last Seven Days)								
eating five or more servings of fruits and vegetables per day	0(0)	53(12.8)	85(20.5)	85(20.5)	54(13.0)	80(19.3)	49(11.8)	9(2.2)
eating high fat foods such as red meat or full-fat dairy products per day (in last SEVEN DAYS)	21(5.1)	86(20.7)	152(36.6)	89(21.4)	31(7.5)	10(2.4)	20(4.8)	6(1.4)
Physical activity/Exercise (In last Seven Days)								
participate in at least 30 minutes of physical activity per day (Total minutes of continuous activity, including walking).	12(2.9)	63(15.2)	99(23.9)	106(25.5)	56(13.5)	49(11.8)	24(5.8)	6(1.4)
participate in a specific exercise session per day (such as swimming, walking, biking) other than what you do around the house or as part of your work	64(15.4)	135(32.5)	104(25.1)	56(13.5)	23(5.5)	14(3.4)	12(2.9)	7(1.7)
Blood Sugar Testing (Within Last Seven Days)								
test blood sugar	136(32.8)	78(18.8)	68(16.4)	42(10.1)	42(10.1)	7(1.7)	21(5.1)	21(5.1)
test blood sugar the number of times recommended by your health care provider	41(9.9)	83(20.0)	61(14.7)	51(12.3)	60(14.5)	51(12.3)	57(13.7)	11(2.7)
Foot Care (Within Last Seven Days)								
check feet	0(0)	26(6.3)	22(5.3)	55(13.3)	44(10.6)	68(16.4)	70(16.9)	130(31.3)
inspect the inner side of shoes	40(9.6)	35(8.4)	86(20.7)	112(27.0)	94(22.7)	18(4.3)	15(3.6)	15(3.6)
Medications (Within Last Seven Days)								
take recommended diabetes medication	0(0)	0(0)	0(0)	8(1.9)	10(2.4)	27(6.5)	116(28.0)	254(61.2)
take recommended insulin injections	107(25.8)	143(34.5)	90(21.7)	40(9.6)	14(3.4)	7(1.7)	7(1.7)	7(1.7)
take recommended number of diabetes pills	8(1.9)	60(14.5)	57(13.7)	63(15.2)	73(17.6)	73(17.6)	44(10.6)	37(8.9)

Table 3. Diabetes self-care activities in different domains with respect to sociodemographic independent variables

Demographic variables	Diabetes self-care activities in different domains (95% confidence intervals)					
	General diet	Specific diet	Physical activity/exercise	Blood sugar testing	Foot Care	Medications
Sex (N=415)						
Male(N=238)	6.36(6.11-6.61)	5.51(5.24-5.77)	3.92(3.65-4.20)	5.13(4.79-5.47)	7.76(7.43-8.08)	11.66(11.33-11.99)
Female(N=177)	6.38(6.09-6.67)	5.16(4.83-5.50)	3.81(3.49-4.13)	4.89(4.46-5.31)	8.12(7.73-8.50)	11.66(11.42-11.90)
P-value	0.924	0.110	0.594	0.376	0.155	0.977
Education (N=415)						
Informal education (N=81)	6.31(5.90-6.73)	5.54(9.06-6.02)	3.93(3.48-4.39)	4.98(4.42-5.54)	8.45(7.92-8.99)	11.25(10.74-11.77)
No schooling (N=36)	5.88(5.26-6.51)	4.66(3.99-5.33)	4.00(3.23-4.76)	4.22(3.25-5.19)	7.41(6.51-8.32)	11.75(10.88-12.61)
Primary (grade 1-5) (N=57)	6.61(6.05-7.17)	5.57(5.00-6.15)	3.66(3.03-4.29)	5.43(4.72-6.14)	8.19(7.49-8.88)	11.15(10.55-11.76)
Lower secondary (grade 6-8) (N=137)	6.40(6.07-6.74)	5.57(5.00-6.15)	3.68(3.32-4.05)	5.05(4.59-5.52)	7.98(7.55-8.41)	12.01(11.58-12.44)
Secondary (grade 9-10) (N=27)	6.44(5.69-7.19)	5.25(4.28-6.23)	3.18(2.39-3.97)	3.70(2.81-4.59)	8.18(7.22-9.14)	12.00(10.89-13.10)
Higher secondary (grade 11-12) (N=54)	6.64(6.11-7.18)	5.46(4.87-6.05)	4.40(3.84-4.97)	5.31(4.48-6.14)	6.00(5.11-6.88)	11.87(11.16-12.57)
Graduate and above (N=23)	5.54(5.06-6.02)	6.34(5.29-7.39)	4.73(3.84-5.63)	6.17(5.01-7.33)	7.91(7.66-8.16)	11.26(10.33-12.18)
p-value	0.382	0.091	0.076	0.018	0.003	0.189
Ethnicity						
Dalit (N=32)	6.34(5.69-6.98)	5.31(4.55-6.07)	3.90(2.99-4.81)	5.12(4.12-6.12)	8.75(7.83-9.66)	11.90(10.99-12.81)
Disadvantage Janatatis (N=48)	6.33(5.73-6.93)	5.25(4.68-5.81)	3.77(3.08-4.45)	4.39(3.64-5.14)	8.12(7.42-8.82)	11.25(10.48-12.01)
Disadvantaged non-dalit Terai group (N=32)	6.06(5.33-6.78)	4.78(4.09-5.47)	4.12(3.29-4.95)	4.53(3.57-5.49)	7.96(6.91-9.01)	11.25(10.50-11.99)
Religious minorities (N=16)	6.50(5.22-7.77)	5.06(3.92-6.02)	4.68(3.44-5.92)	6.06(4.41-7.70)	6.81(5.72-7.89)	11.43(10.00-12.86)
Advantaged Janajatis(N=151)	6.45(6.12-6.77)	5.50(5.12-5.89)	3.77(3.42-4.12)	5.07(4.61)	8.03(7.63-8.44)	11.75(11.35-12.15)
Upper Caste (N=136)	6.36(6.06-6.67)	5.43(5.08-5.78)	3.87(3.54-4.20)	5.18(4.73-5.63)	7.62(7.66-8.16)	11.77(11.35-12.20)
p-value	0.951	0.607	0.685	0.273	0.120	0.680

Table 4. Association between BMI and HbA1c and diabetes self-care activities

Variables	Diabetes self-care activities in different domains (95% confidence intervals)					
	General diet	Specific diet	Physical activity/exercise	Blood sugar testing	Foot Care	Medications
BMI						
Underweight (<18.5) (N=9)	6.55(5.21-7.89)	6.11(4.21-8.01)	4.66(3.17-6.15)	5.22(2.48-7.96)	7.55(5.27-9.83)	11.67(10.45-12.88)
Normal (18.5–<25) (N=141)	6.32(5.96-6.65)	5.39(5.04-5.73)	3.90(3.55-4.24)	5.09(4.62-5.55)	7.90(7.48-8.31)	11.80(11.38-12.22)
Overweight (25–<30) (N=170)	6.44(6.14-6.74)	45.28(4.95-5.61)	3.90(3.28-4.24)	5.02(4.61-5.43)	8.01(7.61-8.41)	11.74(11.37-12.11)
Obese (N=90)	6.31(5.95-6.68)	5.40(4.95-5.84)	3.73(3.28-4.18)	4.93(4.38-5.48)	7.78(7.26-8.31)	11.32(10.79-11.85)
p-value	0.910	0.723	0.655	0.974	0.880	0.506
HbA1c						
HbA1c<7% (Good glycemic control) (N=54)	6.70(6.17-7.23)	6.16(5.40-6.92)	4.66(4.14-5.18)	5.75(5.01-6.50)	8.18(7.41-8.95)	12.12(11.45-12.80)
HbA1c>7% (Poor glycemic control (N=361)	6.23(6.12-6.52)	5.24(5.03-5.45)	3.76(3.53-3.98)	4.92(4.63-5.20)	7.87(7.61-8.13)	11.59(11.33-11.85)
p-value	0.183	0.003	0.004	0.037	0.410	0.141

4. CONCLUSION

Overall the level of self-care activities among diabetic patients in our study was quite low. The general awareness regarding both general and specific diet, physical activity/exercise, blood sugar, testing, foot care and medications were poor in our study. There is a need for ongoing self-management education programs in all hospitals, for patients and caregivers. Peripheral level health functionaries should conduct regular information, education, and communication activities and one-to-one counseling sessions for diabetic patients.

CONSENT AND ETHICAL APPROVAL

The research was approved by a committee of research ethics OPJS university. Written consents were obtained from diabetic patients after a concise explanation of the study with their right to withdraw at any time. The confidentiality of the diabetic patients was maintained. The study participants were not exposed to any increased risk as a result of the study. The result from the study helped the patient in receiving appropriate treatment, hence beneficial. At the end of the study, the diabetic patients were counseled about preventive measures and health awareness were given. Participation in the study was fully voluntary and informed consent was obtained from all participants.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. 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;9(1):31704.
2. Shrivastva A, Phadnis S, Rao N K, Gore M. A study on knowledge and self-care practices about diabetes mellitus among patients with type 2 diabetes mellitus attending selected tertiary healthcare facilities in coastal Karnataka. Clinical Epidemiology and Global Health. 2020; 8(3):689–92.
3. Areej K, Zafar M, Saleem K, Zafar M. Analysis of risk factors among diabetic patients visiting diabetic research clinic at Nishtar Hospital Multan-Pakistan. Asian Journal of Medicine and Health. 2017; 8(1):1–8.
4. Schmitt A, Reimer A, Hermanns N, Huber J, Ehrmann D, Schall S et al. Assessing diabetes self-management with the diabetes self-management questionnaire (DSMQ) can help analyse behavioural problems related to reducedglycaemic control. PLoS ONE. 2016;11(3):1–12.
5. Selvaraj K, Ramaswamy G, Radhakrishnan S, Thekkur P, Chinnakali P, Roy G. Self-care practices among diabetes patients registered in a chronic disease clinic in Puducherry, South India. Journal of Social Health and Diabetes. 2016;04(01):025–9.
6. Raithatha SJ, Shankar SU, Dinesh K. Self-care practices among diabetic patients in Anand district of Gujarat. ISRN Family Medicine. 2014;2014(December 2009):1–6.
7. Schmitt A. The Diabetes Self-Management Questionnaire (DSMQ). Journal Health and Quality of Life Outcomes. 2013; 11(1):1.
8. Aschalew AY, Yitayal M, Minyihun A, Bisetegn TA. Self-care practice and associated factors among patients with diabetes mellitus on follow up at University of Gondar Referral Hospital, Gondar, Northwest Ethiopia. BMC Research Notes. 2019;12(1):1–6.
9. Al shayban D. Using diabetes self-management questionnaire (DSMQ) to assess diabetes self-care activities for diabetes patients in King Fahad University Hospital - Saudi Arabia. Value in Health. 2017;20(9):A482–3.
10. Jannoo Z, Wah YB, Lazim AM, Hassali MA. Examining diabetes distress, medication adherence, diabetes self-care activities, diabetes-specific quality of life and health-related quality of life among type 2 diabetes mellitus patients. Journal of Clinical and Translational Endocrinology. 2017;9:48–54.
11. Kassahun T, Gesesew H, Mwanri L, Eshetie T. Diabetes related knowledge, self-care behaviours and adherence to medications among diabetic patients in

Southwest Ethiopia: A cross-sectional survey. BMC Endocrine Disorders. 2016; 16(1):1–11.

12. Kushwaha A, Kumari S, Kushwaha N. Self care in diabetes: A study amongst diabetics in an urban community. International Journal of Community Medicine and Public Health. 2016;3(1): 293–8.

13. Dedefo MG, Ejeta BM, Wakjira GB, Mekonen GF, Labata BG. Self-care practices regarding diabetes among diabetic patients in West Ethiopia. BMC Research Notes. 2019;12(1):1–7.