Self-Care Practices among Patients with Diabetes Mellitus

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ABSTRACT

Background: Diabetes Mellitus (DM) requires continuous self-care practices to prevent acute and chronic complications. With the possibility of several physical and psychological complications alongside affecting the social aspect of life, improving self-care is highly important in patients with DM. The aim of this study was to measure self-care practices among patients with DM and factors associated with inadequate self-care.

Methods: Information on self-care practices was collected using the summary of Diabetes Self-care Activities (SDSCA) in a hospital based cross-sectional study among 345 participants selected through sequential sampling. Data was analysed using descriptive and inferential statistics and results were presented with proportions and odds ratios with a 95% confidence interval (CI).

Results: We found that 30.7% of the participants had adequate self-care practices across all domains. A fairly substantial proportion had adequate self-care in diet and exercise related care with 87.5% and 65.5%, respectively. However, with foot care and blood sugar monitoring related care only a small to negligible proportion had an adequate level of self-care. Multivariate analysis showed that participants aged 65 years and above had higher odds of having inadequate self-care practices (aOR:5.20; 95%CI: 2.20-12.33); and those with diabetes for more than five years had twice the odds (aOR:2.10; 95%CI: 1.15-3.83) of having inadequate self-care.

Conclusions: A large proportion of the participants had inadequate self-care practices, and this was even poorer in domains of foot care and blood sugar monitoring. Age of the participants, marital status and duration of illness were factors independently associated with inadequate self-care. Targeted behavior change interventions for patients visiting hospitals and health care centers in Nepal could improve self- care practices among patients with DM.

Keywords: Diabetes mellitus; hospital; Kathmandu; Nepal; self-care

INTRODUCTION

Diabetes mellitus (DM) is a complex, chronic illness that requires continuous medical and self-care.[1,2] DM is a major public health problem with a significant impact on human life and health expenditures, and it's burden is rising in many parts of the world with economic development and urbanization.[3] The International Diabetes Federation estimates a total of 537 million people globally to have had DM in 2021 which is expected to increase to 783 million by 2045. While in Nepal the number is estimated to rise from nearly half a million in 2021 to 1.1 million in 2045.[4] Recent studies show prevalence of DM to be 8.5% among adults aged 20 years and above[5] and 5.8% among adults aged 15-69 years.[6] Association of factors like poor nutrition, reduced physical activity and increased sedentary behaviors with DM,[7] and physical, psychological and social complications resulting from DM[8-11] underscores the rationale and hence this study aimed at assessing the self-care practices of patients with DM visiting a tertiary hospital.

METHODS

We carried out a hospital based cross sectional descriptive study in Shree Birendra Hospital, Kathmandu which is a tertiary level hospital specially for the military people and their dependents. A sample size of 345 was determined using the formula for sample size calculation for proportion estimation (z^2pq/d^2) where z was considered

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1.96 for 95% confidence interval; p - the proportion was considered 0.33 (based on adherence to self-care practice in a previous study[12]; q was 1-p and d - the margin of error was considered to be 5%. We did not factor in non-response rate, since we planned a sequential sampling technique for this study, and we would continue to enroll the participants in the study until the required sample size was reached. With this the initial calculation have us 340 and we took slightly higher than that to ensure we have minimum sample size required if there were any missing values in any of the major variables during data collection. Ethical approval was obtained from the Institutional Review Committee of Nepalese Army Institute of Health Sciences. We obtained written permission from the administration at Shree Birendra Hospital to carry out the study. Our study population was patients with physician confirmed diagnosis of DM for more than 6 months (hereafter called participants). The diagnosis of DM was confirmed following an observation of the treatment book they had. We followed a sequential sampling technique meaning the participants meeting the criteria were approached for the participation in the study and enrolled in a sequential order until the required number was reached. Upon approaching the participants, we first explained to them the purpose of the study to obtain informed written consent. Participants who provided the consent were then enrolled in the study. Data collection was done by the researchers themselves at the medical out-patient department (OPD) of the hospital using an in-person interview from February to April 2022. Details about self-care practices were collected using the Summary Diabetes Self-care Activities (SDSCA).[13] The tool used in this study was validated outside Nepal, but has been used in similar settings in Nepal in the past.[12,14] Along with this, a structured questionnaire was used to capture background and illness related information. Pretesting was done among 20 patients in the same hospital where we collected the data, but that data was not used in the main study. Data was entered using SPSS version 20. Following a thorough cleaning of the data in SPSS itself, analysis for deriving both descriptive and inferential results was completed in Stata SE 18. The descriptive results were presented as proportions with 95% confidence interval (CI) and inferential statistics through multivariate logistic regression as adjusted odds ratio (aOR). The variables used for adjustment in regression analysis were age, sex, religion, education, marital status, duration of illness and presence of comorbidity. Firstly, binary logistic regression with a single covariate for the dependent variable (self-care practices) was carried out, followed by multivariate logistic regression to determine the associated factors for inadequate self-care practice.

Average scores for individual categories of care and overall self-care were calculated which were then used for analyzing adequacy of care using the levels as explained further. As a first step, the scores on fatty diet were reversed during data cleaning to ensure consistency on the direction of the scores. The maximum possible individual and average score was 7, and to calculate adequate and inadequate care practices a cut-off value of 3.5 was taken based on a previous study in Nepal.[14] An average score of less than 3.5 was considered as inadequate self-care and more than or equal to 3.5 as adequate self-care. Self-care level was looked upon category wise (diet, exercise, blood sugar monitoring, and footcare) as well as in an overall aspect with all the categories combined. Potential bias in the study was mainly related to recall bias. The participants enrolled in the study were asked about the major variable of the study (self-care practices) for the last 7 days from the time of data collection, which we believe has helped at minimizing this bias.

RESULTS

Table 1 gives an overview of the background characteristics of the participants along with some of the illness related characteristics that were assessed in the study. Slightly above half (55.1%) of the participants were female. About two-fifths (43.5%) and one third (34.4%) of the participants were from the age group 50 to 64 years, and 65 years and above respectively. Just above three quarters (77.4%) of the participants belonged to Hindu religion. A major proportion of them were illiterate (56.2%) with around 20% each having up to 7 years of education and 8 to 12 years of education. Most (84.1%) of the participants were currently married. It was found that more than half (54.8%) of the participants had DM for up to 5 years and the remaining suffered from DM for more than five years at the time of study. Similarly, it was found that 60% of participants had co-morbid conditions with a huge 43.5% having co-morbid hypertension.

Table 1. Background & illness related characteristics

Variables	Attributes	Frequency (n=345)	Percent
Age in years	30-49	73	21.2
	50-64	150	43.5
	65 and above	122	35.4
Sex	Male	155	44.9
	Female	190	55.1
Religion	Hindu	267	77.4
	Non-Hindu	78	22.6

Table 1. Background & illness related characteristics

Variables	Attributes	Frequency (n=345)	Percent
Marital status	Currently Married	290	84.1
	Separated/ Widowed/ Divorced	55	15.9
Educational status	Illiterate	194	56.2
	Up to 7 years of education	79	22.9
	8 to 12 years of education	72	20.9
Duration of diabetes	Up to 5 years	189	54.8
	More than 5 years	156	45.2
Presence of Comorbid disease	No co-morbid disease	139	40.3
	Hypertension	150	43.5
	Other diseases	56	16.2

Table 2 below presents the proportion of participants with adequate and inadequate self-care practices in specific categories. We found that more than two thirds (69.3%) of the participants had inadequate self-care practice in relation to overall self-care that took into consideration all domains assessed namely diet, exercise, blood sugar monitoring and footcare related care. With regards to diet related care, the majority (87.5%) of the participants had adequate self-care practice. Likewise, almost two thirds (65.5%) of the participants had an adequate level of exercise-related self-care. Regarding blood sugar monitoring related care almost all (99.7%) participants had inadequate self-care. A large majority (85.8%) of the participants also had inadequate foot care related self-care practice.

Table 2. Proportion of participants with adequate and inadequate care practices.

Variables	Attributes	Frequency (n=345)	Percent
Diet related care	Inadequate	43	12.5
	Adequate	302	87.5

Table 2. Proportion of participants with adequate and inadequate care practices.

Variables	Attributes	Frequency (n=345)	Percent
Exercise related care	Inadequate	119	34.5
	Adequate	226	65.5
Blood sugar monitoring related care	Inadequate	344	99.7
	Adequate	1	0.3
Footcare related care	Inadequate	296	85.8
	Adequate	49	14.2
Overall self-care	Inadequate	239	69.3
	Adequate	106	30.7

Table 3 below presents the mean score of specific categories of care practices. The mean score on diet related care was 4.65 (±1.04 standard deviation - SD), exercise related care was 4.14 (±2.44 SD), blood sugar monitoring related care was 0.79 ±0.45 SD) and that on foot related care was 1.11 (±1.79 SD), which was also below the cut off value, showing inadequate self-care practice. The mean score on overall self-care was 3.07 (±0.79 SD).

Table 3. Mean score of specific categories of care practices.

Variables	Mean (SD)
Mean score on diet related care	4.65(1.04)
Mean score on exercise related care	4.14(2.44)
Mean score on blood sugar monitoring related care	0.79(0.45)
Mean score on footcare related care	1.11(1.79)
Mean score on overall self-care	3.07(0.79)

Table 4 presents the proportion of inadequate care practices by background characteristics with 95% CI. A similar proportion of around 69% across both sexes had inadequate self-care practice. Most of the participants of age group 65 and above (87.7%) and 50-64 years category (69.3) had inadequate self-care practice, while a lower proportion (38.4%) among younger age group of 30-49 years had inadequate self-care practice. Self-care practice was found to be similar among Hindu (68.2%) and non-Hindu (73.1%) participants. Self-care practice was found to be better among those with higher number of

years of education, with nearly four-fifth (78.9%) of illiterate participants having inadequate self -care practice. This gradually lowered among those with up to 7 years of education (65.8%) and those with 8 to 12 years of education (47.2%). Similarly, self-care practice was found to be poor among separated/divorced/widowed participants with 94.5% having inadequate self-care while only about two thirds (64.5%) currently married participants had inadequate self-care. The longer the disease duration, poorer the self-care practice. About 84% of the participants who had diabetes for more than 5 years had inadequate self-care practice, while this proportion was about 57% among those with diabetes for less than 5 years. About 84% of the participants having other diseases had inadequate self- care practice, and 76.6 % of participants having hypertension as co-morbid condition had inadequate self -care practice. Self-care practice on the other hand, was found slightly better among those without any co-morbid disease conditions with 55.4%.

Table 4. Proportion of participants with inadequate care practices.

Variables & attributes	Frequency	Proportion with inadequate self-care	
		Percentage (%)	95% CI
Sex			
Male	155	69.7	62.0-76.4
Female	190	68.9	62.0-75.1
Age in Category			
30-49 Years	73	38.4	27.9-50.0
50-64 Years	150	69.3	61.5-76.2
65 Years and above	122	87.7	80.6-92.5
Religion			
Hindu	267	68.2	62.3-73.5
Non-Hindu	78	73.1	62.2-81.8
Education			
Illiterate	194	78.9	72.5-84.1
Up to 7 years of education	79	65.8	54.7-75.4
8 to 12 years of education	72	47.2	36.0-58.7
Marital Status			
Currently Married	290	64.5	58.8-69.8
Separated/Widowed/Divorced	55	94.5	84.4-98.2
Illness related Variables			
Duration of having diabetes			
Up to 5 years	189	57.1	50.0-64.0
More than 5 years	156	84.0	77.3-89.0
Presence of Co-Morbidity			
No comorbid disease	139	55.4	47.0-63.5
Hypertension	150	76.7	69.2-82.8
Other diseases	56	83.9	71.9-63.5

In table 5 below, we present the results from multivariate analysis showing a number of factors being significantly associated with diabetes self-care after adjusting for the covariates assessed during the study. Increasing age was one of those factors with participants' age of 50 to 64 years having two and half times (95%CI: 1.33-4.97)) and 65 years and above having 5 times (95%CI: 2.20-12.33) higher odds of inadequate self-care practice compared to those in the age group 30 to 49 years. Similarly marital status appeared to be another factor associated with inadequate self-care with separated/widowed/divorced participants having nearly four times higher odds of having inadequate self-care but with

a wider CI (95%CI:1.10-13.93). Finally, participants having diabetes for more than five years had twice as high (95%CI: 1.15-3.83) odds of having inadequate self-care practice compared to those with diabetes up to 5 years.

Table 5. Factors associated with Inadequate Self-care.

Variables & attributes	Frequency	Crude OR		Adjusted OR	
		OR	95% CI	OR	95% CI
Sex					
Female	190	1	1	1	1
Male	155	1.03	0.65-1.64	0.85	0.48-1.51
Age in Category					
30-49 Years	73	1	1	1	1
50-64 Years	150	3.63	2.02-6.53	2.57	1.33-4.97
65 Years and above	122	11.46	5.60-23.49	5.20	2.20-12.33
Religion					
Hindu	267	1	1	1	1
Non-Hindu	78	1.28	0.72-2.23	1.49	0.78-2.85
Education					
8 to 12 years of education	72	1	1	1	1
Illiterate	194	4.17	2.34-7.43	1.87	0.94-3.69
Up to 7 years of education	79	2.15	1.12-4.15	1.81	0.89-3.70
Marital Status					
Currently Married	290	1	1	1	1
Separated/Widowed/Divorced	55	9.55	2.91-31.33	3.91	1.10-13.93
Illness related Variables					
Duration of having diabetes					
Up to 5 years	189	1	1	1	1
More than 5 years	156	3.93	2.35-6.58	2.10	1.15-3.83
Presence of Co-Morbidity					
No comorbid disease	139	1	1	1	1
Hypertension	150	2.65	1.60-4.38	1.04	0.56-1.93
Other diseases	56	4.20	1.91-9.24	1.26	0.49-3.24

DISCUSSION

DM is a challenging chronic disease condition which continuously requires to follow regular self-care practices in diet, exercise, foot care and regular blood glucose monitoring. Better self-care practice has been found to have been associated with better outcomes with reduced morbidity and complications. Identification of factors that predict these self-care practices deemed important in the Nepalese context. We carried out a cross-sectional hospital-based study which assessed the self-care practice among patients with DM.

We found that only three among ten participants had adequate self-care practice in this study. Similar result was observed in different studies from Ethiopia, which reported an adequate level of self-care practice between 35 to 40%.[15-17] However, this finding is inconsistent with the results from a study in eastern Nepal, which showed 70.0% of participants had good self-care practice.[18] There were several other studies from across the world which showed a higher percentage (between 50 to 60%) of participants with adequate or good level of self-care practice.[19-22] The difference could be because of difference in study population, study area, cultural settings and interventions related to diabetes care.

Among the recommended self-care practices, our study revealed adequate level of diet related care and exercise related care among majority of the participants. This is consistent with findings from a study in North-East India, where nearly four-fifth (78.85%) of the participants followed healthy eating plan.[23] However, there were studies from South Ethiopia[24], South India[25], and including a systematic review and meta-analysis of studies from Ethiopia[26] that showed only about one in two participants having adequate diet related self-care which is lower than that of our study. The same studies also showed that nearly half of the participants (proportion ranging from 44 to 50%) had adequate exercise related self-care.[24-27] The study from eastern Nepal had relatively similar proportion of patients with adequate level of exercise related care (60%) to that of our study.[18]

This study showed that a huge majority (85.8%) of the participants had inadequate foot-care related self-care, and almost all (99.7%) had inadequate blood sugar monitoring related self-care practice. These findings are supported by another study in rural Karnataka in India which showed 99.5% of participants having poor foot care practice and 65% of participants (though slightly lower than the current study) having poor self-care practice of monitoring of blood sugar.[28]

Our findings of higher proportion of illiterate people and people with co-morbid disease condition having inadequate self-care corresponds with another study from Nepal which showed that 80% of illiterate participants and 76.2% of participants with co-morbid disease condition had inadequate self-care practice.[29] Diabetes self-care was seen to be deteriorating with increasing age in our study, and this finding is supported by a study in Ethiopia where younger age group (25-34 years) had almost 9 times higher odds of having good self-care practice,[30] but was not consistent with a finding from a study in India that reported a substantially poorer level of self-care practice among patients aged less than 60 years.[20]

A significant association of being separated/widowed/divorced with inadequate self-care in our study was also supported by a study in southern India which showed that currently married participants of the study had higher odds of having diet, exercise and blood sugar monitoring related care.[31] We found participants having diabetes for more than 5 years had about twice as higher odds of having inadequate self-care practice, which is inconsistent with a study from West Bengal, India, where the participants with longer duration of diabetes had three times higher odds of adequate self-care practice.[32]

With regards to the strengths and limitations, this study comes with the strengths such as a good sample size where we have captured patients with diabetes at the point of care. Interviewing patients at the point of care comes with higher chances of minimising recall bias for information related to their condition. All the cases included in the study had physician confirmed diagnosis verified with patient records. Nevertheless, this also has certain limitations, that it might give a true representative picture of a wider community, since this only captured the perspective of those visiting hospital.

CONCLUSIONS

A substantial proportion of the participants having inadequate self-care practices underscores the importance of self-care education and awareness among patients with DM. Behavior change interventions targeting the need for regular blood sugar monitoring might be helpful to improve blood sugar monitoring related care. Targeted approach for elderly patients and patients with the condition for longer years might help addressing the issue alongside general behavior change interventions.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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