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SELF-CARE PRACTICES AMONG ADULT PATIENTS NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN SELECTED LEVEL FIVE HOSPITALS IN KENYA

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ABSTRACT

Background: Self-care practices refers to patient's real-life application of the knowledge acquired on diabetes management. In Kenya, the prevalence of diabetes related complications has been on the rise and this has been linked to poor self-care practices.

Objective: To determine the self-care practices among adult patients newly diagnosed with Type 2 Diabetes Mellitus (T2DM).

Materials and Methods: Descriptive cross-sectional design was adopted. A total of 124 patients newly diagnosed with T2DM were randomly recruited from the selected hospitals. Data was collected using a questionnaire modified from the Diabetes Self-Management Questionnaire (DSMQ). Descriptive analysis was done to generate frequencies while chi-square was used to assess association between variables ($p \leq 0.05$ at 95% CI).

Results: Of 124 respondents, 70 (56.5%) were females with most 35 (28.2%) belonging to the age group between 60-69 years. Regarding the duration of T2DM since diagnosis, 45 (36.3%) reported that they were diagnosed at least four months ago. Poor self-care practices were noted in 69 (55.6%) of the respondents, with the mean and standard deviation being 4.92 (± 1.10), mean score ranging from 0 to 10. However, there was no significant association between self-care practices and respondents' characteristics.

Conclusion and Recommendation: Self-care practices among the respondents was poor, hence the need for clinicians to conduct a needs assessment among patients

newly diagnosed with T2DM in order to identify gaps in their self-care. This will also help in developing evidenced based diabetes education materials.

INTRODUCTION

The prevalence of Type 2 Diabetes Mellitus (T2DM) is rising drastically globally and in Africa due to the changing lifestyle patterns in the population above 18 years of age. International Diabetes Federation (IDF) recognizes diabetes mellitus as a major health problem with an approximate of 463 million adults living with the condition ¹. A study done to estimate the mortality attributed to diabetes among adults aged 20-79 years in 2019 found that globally, 4.2 million adults are estimated to die from diabetes, accounting for 11.3% of deaths from all causes. Further, the study reported that in Africa, 6.8% of all deaths are attributable to diabetes ².

In Kenya, the prevalence of T2DM has been on the rise making it a major concern in the country. North Eastern region of Kenya has the highest prevalence of T2DM at 2% followed by the Central region at 1.7% ³. There is a substantial increase in the number of people being newly diagnosed with T2DM in Kenya. For instance, the Ministry of Health has raised alarm over the growing number of people being newly diagnosed with diabetes mellitus in Muranga County, Kenya. By the year 2019, 28, 447 new cases were reported a rise from 14,950 in the year 2017 ⁴. Hence, there is a need to initiate active self-management in this population.

Individuals diagnosed with T2DM are required to effectively manage their health on their own in order to achieve normoglycemia. Self-care practices such as dietary management, drug adherence, physical activities, foot care, stress management and periodic health reviews determines patients glycaemic control ⁵. However, it has been

observed that when an individual is newly diagnosed with T2DM they struggle to adjust their lifestyle behaviours ⁶. The study attributed this to the fact that at the time of diagnosis patients are in dire need of information on how they can self-manage their condition.

Studies done in Kenya have reported deficit in self-care practices. In Kitui County, Kenya half 29 (50.9%) of patients diagnosed with T2DM were found not to adhere to the recommended self-care practices ⁷. Similarly, a study done in Thika, Kenya reported that patients diagnosed with T2DM scored 7.6 out of 14 in their self-care practices ⁸. If not properly managed diabetes can lead to stroke, heart attack, kidney failure and lower limb amputation and this is highly associated with high mortality rate ¹.

As the prevalence of diabetes mellitus rises in Kenya, a rise in diabetes related complications has also been observed. At Kenyatta National Hospital the largest referral hospital in Kenya, it has been observed that chronic kidney disease constituted the highest number of hospital admission due to diabetes related complications at 38.6% ⁹. Similarly, in central region of Kenya, only 28.6% of patients diagnosed with T2DM were found to have achieved optimal glycemic control glycated hemoglobin (HbA1c) < 7.0%. Of these patients, 35.3% had developed diabetes related complications ¹⁰. Therefore, there is need to develop evidenced based approaches to curb the rising morbidity and mortality rates.

When T2DM is not properly managed, it will also lead to higher cost of health care creating immense financial burden on the patients, their families and the countries healthcare system. The estimated direct cost of diabetes care in Kenya is USD 413 per patient and USD

213 indirect cost¹¹. Hence the aim of this study was to determine the self-care practices among patients newly diagnosed with T2DM. Recommendations were also made on the approaches that clinicians can adopt to enhance self-care management, so as to improve patient's health and quality of life.

MATERIALS AND METHODS

Study design

This was a cross-sectional study design conducted between January and March 2023 as a baseline survey for a pretest–posttest non-equivalent quasi-experimental study.

Study Setting

The study was conducted at Murang'a and Kiambu level 5 Hospitals located in the central region of Kenya. According to the Kenya Demographic and Health Survey 2014, Central Kenya has the second highest cases of Non-Communicable Diseases at > 50% and out of this T2DM ranks the highest at 41%³. Therefore, the two Level 5 Hospitals were purposively selected.

Study Participants

Study participants consisted of 124 adult patients newly diagnosed with T2DM. The sample size was determined based on the formula for comparative studies using proportions then simple random sampling was used to recruit participants. The inclusion criteria included adult patients newly diagnosed with T2DM. A newly diagnosed patient was defined as an individual who had been registered as having been diagnosed with T2DM in the last six months by the time of data collection. This was according to the patients' registry for individuals attending the diabetes clinic in the study areas. Exclusion criteria included patients whose clinic records indicated that they had been diagnosed with diabetes related complications. This is because

at the time of the study they were also attending other specialized clinics and were therefore more likely to contaminate the study.

Study Tools

An interviewer-administered questionnaire was used to collect data on participant's socio-demographic and clinical data. A questionnaire modified from the Diabetes Self-Management Questionnaire (DSMQ) was used to assess patient's self-care practices¹². In this questionnaire, items that were negatively worded were reversed so that higher scale scores reflected more optimal self-care practices. It consisted of nine subscales: diet, medication adherence, monitoring of blood glucose, physical activity, foot care, smoking and alcohol intake, problem solving and healthcare use. Each item was designed for patients to self-describe their self-care practices over the past seven days using a four-point Likert scale (3 – “applies to me very much”; 2 – “applies to me to a considerable degree”; 1 – “applies to me to some degree”; 0 – “does not apply to me”). Total scores were calculated as total raw score divided by the theoretical maximum score and then transformed to a scale ranging from 0 to 10. A score of ≤ 5.0 was interpreted that the patient had poor self-care practices while a higher score represented better self-care practices¹².

Study Procedure

Study tools were pretested to ascertain their suitability, appropriateness and practicability. Face and construct validities were ensured to ascertain that the study tools were formulated based on the study objectives. Reliability of the tool as determined by Cronbach's α coefficient was at 0.81. Data was collected by the primary investigator together with two trained research assistants. The researcher first sought informed consent from the participants and then data was collected. The tools were then

checked for completeness and accuracy then coded before the data entry.

Data Management

Data Entry, Analysis and Presentation

Data was entered into Statistical Package for Social Sciences (SPSS) version 26 for analysis. Levene's test was used to ascertain similarity of variances between the two study areas ($p=0.365$). Socio-demographic and clinical characteristics were presented using descriptive statistics. Chi-square test of significance was used to assess the association between self-care practices and socio-demographic and clinical variables. A p-value of ≤ 0.05 was considered statistically significant. The data was presented in form of tables.

Ethical Considerations

Ethical approval was obtained from Kenyatta University Ethics Review Committee PKU/25602/E1726 and

NACOSTI/1/p/22/21150. Authorization to carry out the study was also sought from the Ministry of Health County Health Research Department. The aim of the study and all procedures were explained to the study participants. Voluntary and informed consent was then sought. Participants' names on the study tools were omitted to ensure anonymity. Confidentiality of data collected was observed.

RESULTS

Socio-demographic characteristics of the respondents

Majority 70 (56.5%) of the respondents were female. Eighty-nine 89 (71.8%) of the respondents were married while 71 (57.3%) resided in the urban set up. Most of the respondents had attained either primary education or secondary education at 58 (46.8%) and 46 (37.1%) respectively (Table 1).

Table 1
Socio-demographic Characteristics

Variable	Category	Frequency N (%)
Gender	Male	54 (43.5%)
	Female	70 (56.5%)
Age	20-29	5 (4.0%)
	30-39	17 (13.7%)
	40-49	30 (24.2%)
	50-59	29 (23.4%)
	60-69	35 (28.2%)
	>70	8 (6.5%)
Marital status	Single	14 (11.3%)
	Married	89 (71.8%)
	Widowed	12 (9.7%)
	Divorced/ separated	9 (7.3%)
Occupational status	Formal employment	22 (17.7%)
	Self-employment	55 (44.4%)

	Unemployed	31 (25.0%)
	Pensioner	16 (12.9%)
Religion	Christianity	122 (98.4%)
	Other	2 (1.6%)
Residence	Urban setting	71 (57.3%)
	Rural setting	53 (42.7%)
Level of Education	None	4 (3.2%)
	Primary	58 (46.8%)
	Secondary	46 (37.1%)
	College/university	16 (12.9%)

Respondents' clinical characteristics

From the time of diagnosis most 45 (36.3%) of the respondents had lived with diabetes for a

period of four months. In terms of Body Mass Index (BMI) only, 43 (34.7%) of the respondents had a healthy weight (Table 2).

Table 2
Clinical Characteristics

Variable	Category	Frequency N (%)
Clinical Duration of T2DM	One month and below	16 (12.9%)
	Two months	12 (9.7%)
	Three months	25 (20.2%)
	Four months	45 (36.3%)
	Five months	10 (8.1%)
	Six months	16 (12.9)
Treatment Regime	Oral anti-diabetic drugs only	92 (74.2%)
	Insulin only	18 (14.5%)
	Oral anti- diabetic drugs and insulin	11 (8.9%)
	Do not know	1 (0.8%)
	On diet only	2 (1.6%)
Body Mass Index (BMI)	Underweight (< 18.5)	6 (4.8%)
	Normal (18.5-24.9)	43 (34.7%)
	Overweight (25-29.9)	33 (26.6%)
	Obesity (>30)	42 (33.9%)

Respondents' Self-care practices

Interviewer administered questionnaire modified from the DSMQ was used to collect data on respondent's self-care practices. Respondents were required to describe their

self-care practices over the past seven days under each item using a 4-point Likert scale. The study found that only 11 (8.9%) of the respondents reported that they had followed a healthy eating plan as recommended. A high

proportion of the respondents reported that they were smoking and taking alcohol very much at 11(8.9%) and 16 (12.9%) respectively (Table 3).

Table 3
Respondents Self-care Practices

	Item	Does not apply to me (0)	Applies to me to some degree (1)	Applies to me to a considerable degree (2)	Applies to me very much (3)
		N (%)	N (%)	N (%)	N (%)
1	I have followed a healthy eating plan (on average per week in the last one month)	5 (4.0%)	63 (50.8%)	45 (36.3%)	11 (8.9%)
2	I eat five or more servings of fruits and vegetables in a day	8 (6.5%)	77 (62.1%)	34 (27.4%)	5 (4.0%)
3	I space my carbohydrates evenly throughout the day as recommended	6 (4.8%)	71 (57.3%)	42 (33.9%)	5 (4.0%)
4	I take my anti-diabetic drugs as prescribed by the doctor	8 (6.5%)	12 (9.7%)	32 (25.8%)	72 (58.1%)
5	I check and record my blood glucose levels as recommended	19 (15.3%)	56 (45.2%)	33 (26.6%)	16 (12.9%)
6	I engage in at least 30 minutes of physical activity 3-4 times in a week	7 (5.6%)	59 (47.6%)	53 (42.7%)	5 (4.0%)
7	I examine my feet as recommended by the healthcare provider	34 (27.4%)	62 (50.0%)	26 (21.0%)	2 (1.6%)
8	I inspect inside my shoes as recommended by the healthcare provider	37 (29.8%)	63 (50.8%)	22 (17.7%)	2 (1.6%)
9	I have smoked at least once in the last 7 days	110 (88.7%)	2 (1.6%)	1 (0.8%)	11 (8.9%)
10	I have taken alcohol in the last 7 days	106 (85.5%)	2 (1.6%)	0 (0.0%)	16 (12.9%)
11	I have learnt to solve problems and manage stress	16 (12.9%)	51 (41.1%)	55 (44.4%)	2 (1.6%)
12	I have adhered to all my scheduled diabetes clinics	15 (12.1%)	41 (33.1%)	28 (22.6%)	40 (32.3%)

Respondents' self-care practices scores

Respondents' different aspects of self-care practices were represented by a single score ranging from 0 to 10 in the current study. The

self-care practices scores were then classified as (≤ 5.0) poor self-care practices and (≥ 5.1) as good adherence to self-care practice. The study findings showed that majority 69 (55.6%) of the

respondents had poor adherence to the recommended self-care practices (Table 4).

Table 4
Respondents' Self-care Practices Scores and the Mean

Self-care practice	Descriptive Statistics			
	N (%)	Mean	Std. Error	Std. Deviation
Poor	69 (55.6%)			
Good	55 (44.4%)			
Total	124	4.92	0.0990	1.1019

Distribution of self-care practices according to Respondents' socio-demographic characteristics
Irrespective of their socio-demographic characteristics most of the respondents scored poor self-care practices. Good adherence to self-care practices was registered in respondents who were between the age of 30-

39 years and in formal employment at 10 (8.1%) and 7 (5.6%) respectively. Overall there was no statistically significant association observed between self-care practices and respondent's socio-demographic characteristics (Table 5).

Table 5
Distribution of Self-care Practices according to Respondents' Socio-demographic Characteristics

Variable	Category	Self-care practices		df, χ^2	P value
		Poor	Good		
Gender	Male	31 (25.0%)	23 (18.5%)	25, 21.976	0.637
	Female	39 (31.5%)	31 (25.0%)		
Age	20-29	3 (2.4%)	2 (1.6%)	125, 108.436	0.850
	30-39	7 (5.6%)	10 (8.1%)		
	40-49	17 (13.7%)	13 (10.5%)		
	50-59	17 (13.7%)	12 (9.7%)		
	60-69	20 (16.1%)	15 (12.1%)		
	>70	5 (4.0%)	3 (2.4%)		
Marital status	Single	10 (8.1%)	4 (3.2%)	75, 56.910	0.941
	Married	46 (37.1%)	43 (34.7%)		
	Widowed	8 (6.5%)	4 (3.2%)		
	Divorced/ Separated	5 (4.0%)	4 (3.2%)		
Occupation	Formal Employment	15 (12.1%)	7 (5.6%)	75, 78.659	0.364
	Self-employed	31(25.0%)	24 (19.4%)		
	Unemployed	18 (14.5%)	13 (10.5%)		
	Pensioner	5 (4.0%)	11 (8.9%)		
Religion	Christianity	68 (54.8%)	54 (43.5%)	25, 11.471	0.990
	Other	1 (0.8%)	1 (0.8%)		
Residence	Urban setting	38 (30.6%)	33 (26.6%)	25, 26.141	0.400

	Rural setting	31 (25.0%)	22 (17.7%)		
Level of Education	None	3 (2.4%)	1 (0.8%)	75, 80.402	0.314
	Primary	34 (27.4%)	24 (19.4%)		
	Secondary	23 (18.5%)	23 (18.5%)		
	College/ University	9 (7.3%)	7 (5.6%)		

Distribution of self-care practices according to Respondents' clinical characteristics

Respondents who had lived with T2DM for four months registered better adherence to self-care practices 23 (18.5%). Moreover, the study found that respondents who were

overweight and obese had poor self-care practices at 21 (16.9%) and 22 (17.7%) respectively. The study found no significant association between self-care practices and respondents clinical characteristics (Table 6).

Table 6

Distribution of Self-care Practices according to the Respondents' Clinical Characteristics

Variable	Category	Self-care practices		df, χ^2	P value
		Poor	Good		
Clinical Duration of T2DM	One month and below	13 (10.5%)	3 (2.4%)	125, 135.344	0.249
	Two months	7 (5.6%)	5 (4.0%)		
	Three months	13 (10.5%)	12 (9.7%)		
	Four months	22 (17.7%)	23 (18.5%)		
	Five months	5 (4.0%)	5 (4.0%)		
	Six months	9 (7.3%)	7 (5.6%)		
Treatment Regime	Oral anti-diabetic drugs only	50 (40.3%)	42 (33.9%)	100, 102.876	0.402
	Insulin only	11 (8.9%)	7 (5.6%)		
	Oral anti-diabetic drugs and Insulin	7 (5.6%)	4 (3.2%)		
	Diet	0 (0.0%)	3 (2.4%)		
BMI	Underweight < 18.5	4 (3.2%)	2 (1.6%)	25, 32.845	0.135
	Normal 18.5-24.9	22 (17.7%)	21 (16.9%)		
	Overweight (25-29.9)	21 (16.9%)	12 (9.7%)		
	Obesity >31	23 (18.5%)	19 (15.3%)		

DISCUSSION

The present study was conducted to determine self-care practices among adult patients newly

diagnosed with T2DM. Analyses of the various aspects of diabetes management showed that adherence to prescribed medication was the most adhered self-care practice. These findings

were consistent with a study done in Ethiopia where majority of patients diagnosed with T2DM reported that they adhered to their treatment as prescribed¹³. The high adherence to medication compared to other self-care practices could indicate that patients diagnosed with T2DM prefer taking medications rather than adjusting their lifestyle behaviours.

Self-care practices plays a very crucial role in achieving normoglycemia among patients diagnosed with T2DM. This study showed that most respondents had poor compliance to the recommended nutrition. Similar findings were reported in a study done in Kenya where only half of the participants had adhered to the recommended dietary plan⁷. In the current study, only few of the respondents reported to have engaged in 30-minute physical activity for at least five days in a week as recommended. Poor adherence to exercise was also described in a study done in Malaysia where most of the participants did not engage in the recommended physical activity¹⁴. The poor performance to physical activity was associated to age, since almost half of the participants in the study were aged more than 60 years.

Proper foot care is crucial in preventing diabetes complications such as foot ulcer and limb amputation. However, this study found that most respondents did not perform foot care as recommended by their healthcare provider. These findings are inconsistent with a study done in Saudi Arabia where foot care compliance was the most adhered self-care practice¹⁵. Adherence to foot care in this study was associated with the Islamic practice of ablution where individuals wash their feet in preparation for prayers and the cultural dress code of wearing open shoes with feet and toes exposed.

In the current study, the mean self-care practices score was low, indicating a deficit in key areas of diabetes management. The findings are closely related to another study done in Kenya where the mean self-care practices score was below average⁸. Current findings were inconsistent with a study done in Malaysia where participants recorded a high mean DSMQ score. The study further found that poor self-care practices was significantly associated with duration of T2DM less than one year¹⁶. The contrasting findings pertaining self-care practices observed in different countries could be influenced by the cultural and socio-economic differences of these countries.

CONCLUSION

The findings from this study imply that a noticeable proportion of the patients newly diagnosed with T2DM had inadequate self-care practices, more so in terms of diet therapy, foot care and follow up visits. In addition, the study recorded that smoking and taking alcohol were prevalent among patients newly diagnosed with T2DM.

RECOMMENDATIONS

Effective self-care practices make the management of T2DM easier for the patients. It also eases the burden of diabetes management on the patient and the caregivers as well. Therefore, continuous effort should be made by the healthcare professionals to determine precisely how an individual newly diagnosed with T2DM can adhere to the recommended lifestyle modifications. Additionally, there is need to identify factors that enhance better prognosis among individuals diagnosed with T2DM. As thus, there is need to develop targeted evidence

based educational approaches among patients newly diagnosed with T2DM. This will aid in empowering them at an early stage and narrowing the existing gaps on diabetes self-care management.

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