KNOWLEDGE AND SELF-CARE PRACTICES AMONG DIABETIC PATIENTS-A CASE STUDY OF THIKA LEVEL 5 HOSPITAL, KENYA

Eunice Gathoni Wamucii , Dr. Florence Kyallo and Dr. Beatrice Kiage
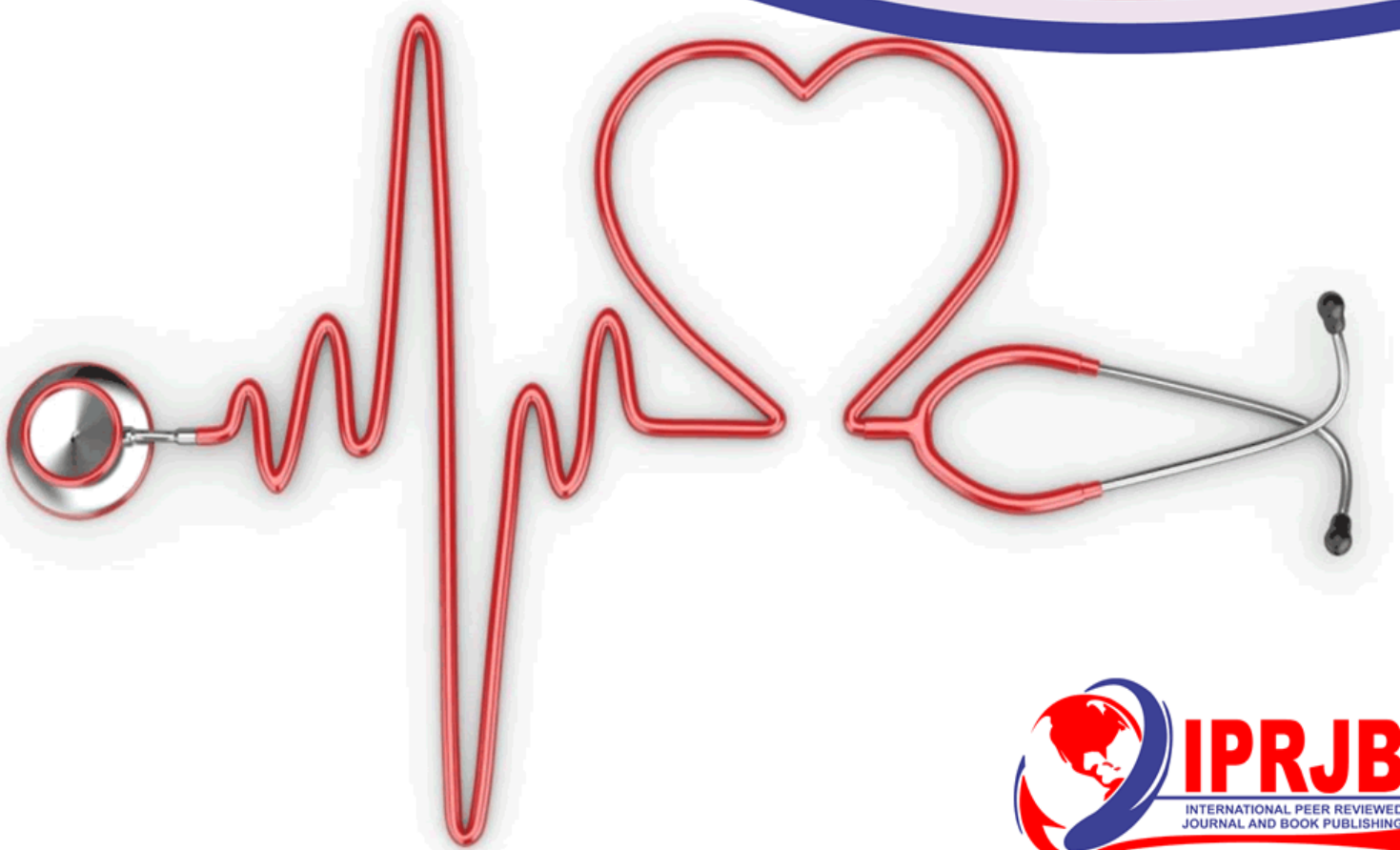
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KNOWLEDGE AND SELF-CARE PRACTICES AMONG DIABETIC PATIENTS-A CASE STUDY OF THIKA LEVEL 5 HOSPITAL, KENYA

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Abstract

Purpose: The main aim of the study was to determine the level of self-care knowledge and practices among diabetic patients in Thika level 5 Hospital.

Methodology: Cross-sectional study design was used in this study. The target population included patients living with diabetes seeking medical services at the diabetic clinic at Thika Level V hospital. Being the largest referral hospital that served patients form the entire Kiambu County, the hospital was purposely selected. Simple random sampling technique was used to select 190 respondents among patients visiting the diabetic clinic. Structured questionnaire that was interviewer administered was used to collect data. SPSS version 21 software was used for data analysis.

Findings: The mean diabetes knowledge score was 7.7 out of a total of 14 and the mean self-care activities score was 7.6 out of a total of 14, indicating a deficit in a number of key areas in the knowledge and self-management of diabetes. There was statistical significant relationship between patient's level of knowledge of diabetes self-care practices and age (χ^2 (4, N=190) = 10.189, p = .037), education level, (χ^2 (6, N=190) = 17.861, p = .007) and employment status, (χ^2 (6, N=190) = 16.655, p = .011).Statistically significant association was also found between adherence to recommended diabetes self- care practices and age, χ^2 (4, N=190) = 4.501, p = .034, education level, χ^2 (6, N=190) = 15.616, p = .016, employment status, χ^2 (1, N=190) = 3.830, p = .005. Pearson correlation between knowledge of diabetes self-care practices and adherence to diabetes self-care practices was weak in strength and statistically significant r (188) =0.367, p=< 0.01. This implies that the three factors are significant determinants of the level of self-care knowledge and practices among diabetic patients in Thika level V hospital.

Unique contribution to theory, practice and policy: The research demonstrated gaps in self-care knowledge and adherence to self-care practices. Moreover patient's level of knowledge hardly translated to good self-care practices. It is hence important to integrate behavioral change theories into the diabetes educational interventions which may facilitate problem solving skills that will enhance the application of acquired knowledge among the diabetic patients. In addition, more research is warranted to explore patients' perceptions and attitude towards the effectiveness of their self-care management so the diabetic education can be tailored according to patients' needs.

Key Words: Level of adherence, recommended self-care practices, Diabetes Mellitus patients, Thika Level V hospital.

1.0 INTRODUCTION

Diabetes mellitus (DM) is the 4th main cause of death among the non-communicable diseases (NCDs) globally, (Jones, 2013). Type 2 diabetes which was previously referred to as Maturity onset or Non-insulin Dependent diabetes is caused by the inadequate production of insulin, body cell insulin resistance or both. It is the most prevalent type of diabetes where about 85 - 90% of diabetes patients suffer from type 2 diabetes, (Quansah et al., 2018).

Over the past decades, the prevalence of diabetes has been rising at an alarming rate. The global burden of diabetes has risen from 108 million in the year 1980 to 246 million people in the year 2007, (Rocha Fernandes, et al., 2016). Currently, it affects over 366 million people worldwide and this number is estimated to double by 2030, (Mwaloma, 2016).The burden of this condition is highly felt in developing countries where it accounts for about 80% of all diabetes cases worldwide. Approximately, Africa sums 13.6 million people with diabetes while the Sub-Saharan African region counts about 7 million people with diabetes. Estimates for the number of DM in Sub- Saharan region for 2025 are likely to double and reach 15 million, (Quansah et al., 2018).

 In Kenya, the World Health Organization (WHO) estimates that the prevalence of diabetes to be 3.3% and forecasts a rise to 4.5% by 2025. However, this figure is likely to be an underestimation because over 60% of people with diabetes in Kenya are undiagnosed and a majority of them present to the health care facility with seemingly unrelated complaints, (Fitzgerald, et al., 2016). The disease is one of the most growing epidemics that threatens to overwhelm health services and affect economies, especially in developing countries, (Mbutiti, 2016). Healthcare expenditures on diabetes were estimated to be 11.6% of the total healthcare expenditure in the world in 2010, (Rocha et al., 2016). Being a developing country, Kenya has limited resources to take care of the additional burden of diabetes and its complications, (MOPHS, 2015).

Of all non-communicable diseases in Africa, DM has the highest morbidity and mortality rates. It is among the leading causes of reduced quality of life, disability, and death through its complications. DM is a risk factor for, cardiovascular diseases, amputations, visual impairment and renal failure all of which are life-changing through disruption of the physical, psychological, and social balance of an individual's life. Furthermore, complications of diabetes such as loss of sexual function, blindness, and amputations result in loss of self-esteem in individuals and change in social relationships, (Islam, et al., 2015)

Since diabetes has no cure, it is normally managed throughout the life of individuals suffering from it, (Formosa, 2016). Effective diabetes management requires a complex approach that is not merely just being adherent to medical advice but also involves the adoption of various skills and behaviour to effectively manage the disease. Change of personal lifestyle in a diabetic patient is enhanced through an enhanced self-management education program that provides knowledge and skills which motivates the patient to adopt a healthy lifestyle that helps them manage the disease, (Kones, 2016).

Self-care is the regimen of tasks that a diabetic individual performs daily to manage diabetes. The recommended self-care practices by the Kenya National guidelines for the management of diabetes includes regular physical activity, healthy dietary practices, daily foot care, compliance to the treatment regimen, tackling complications such as hypoglycemic episodes and regular blood glucose monitoring, (MOPHS, 2010).

Earlier studies have held the notion that education and knowledge correlate well with good self-care practices and a significant reduction in DM complications. Knowledge not only enables DM patients to

effectively follow their treatment but also improves their self-care behaviors, (Sharma et al., 2008). However, many diabetic individuals find the self-care routine challenging, difficult, and demanding when they are instructed to make certain changes in their entire lives especially in terms of food consumption and physical activity on top of their medications, (Choon et al., 2015).

According to the Ministry of Public Health and Sanitation, (2010), self-care practices guideline has been recommended by the Kenya national clinical guidelines for the management of diabetes Mellitus. However, limited evidence has been documented on the accuracy and content of self-care management in Kenya. This might consequently hinder efforts to address self-care management issues and the development of interventions to improve self-care management. This study hence aims to evaluate the level of adherence to recommended self-care practices among Diabetes Mellitus patients and also find out the factors associated with the level of adherence.

Problem statement and justification

Individual's care for diabetes has a great impact on their outcomes than those made by their health care professionals. Effective diabetes management should have a patient-centered model that puts the patient together with their household members at the center of care in partnership with the health care professionals. The health care professional's main role is to help diabetic individuals develop problem-solving skills and have the ability to apply self-care knowledge in real-life situations. Patients on the other hand are in charge of their self-care behaviors by making their own decisions and choices, (Mwaloma, 2016).

To date, health care requirements have traditionally been founded on the model designed to treat and manage acute illnesses. The model has the health care professionals as the main role player where they have the authority in diagnosis, treatment, and the patient's outcome in the management of diabetes, (Quansah et al., 2018). Inability of patients to successfully manage diabetes has been attributed to the failure of compliance to prescribed medication regimes in majority of health facilities. Consequently, patients have been putting little effort into the management of diabetes mellitus. Poor self-care has been associated with poor glycemic control among the majority of people living with diabetes mellitus which has been associated with multiple complications and co-morbidities. The two have been attributed to be the most common causes of death among diabetes patients,(Jones, 2013).

The ministry of health and sanitation is addressing the need for improvements through various strategies such as development of the Kenyan National Diabetes Strategy developed in 2010, the Diabetes Education Programme and, the National Clinical Guidelines for Management of Diabetes (Chali, et al., 2018). All these were developed to improve the quality of life of diabetics by reducing complications and premature mortality. However, there is limited knowledge among the majority of both the health care professionals and the diabetic patients which causes ineffective diagnosis, treatment, control and, management of the disease, (Gesare,2016).

The majority of the researches done in Kenya focused more on the medical prescriptive approach which is only one aspect of self-management. This traditional compliance model does not enforce shared decision making or the independent thinking needed in diabetes self-management. Little therefore is known about the factors that influence compliance to self-care practices among the diabetics in Kenya. This has resulted in limited information on diabetes mellitus patients' adherence to recommended self-care practices and factors that influences adherence. This could be used to guide the policymakers to

make informed suggestions for improvements in the approach to managing the disease. A study hence is needed to shed more light on the same.

This study looked at other components of self-management that helped shed light on the reasons for the poor self-care of diabetes and poor glycemic control prevalent in many diabetic people in Kiambu County. The information gathered may then help policymakers to make informed suggestions for improvements, assist in priority setting for diabetes management among diabetic persons by the health facilities and relevant NGOs.

2.0 THEORETICAL FRAMEWORK AND CONCEPTUAL FRAMEWORK

2.1 Theoretical framework

Orem's self-care theory for persons with type 2 diabetes mellitus self-care management

According to Dorothea E. Orem (2001), Orem's self-care model is a complete self-care theory that offers a good clinical guide for planning and implementing the principles of good self-care, (Craven et al., 2010). Human beings can always take care of themselves and whenever their capacity is distorted, nurses can assist the individual to recover their ability by providing direct care, and compensatory educational support, (Hemmati et al., 2012)

The theory indicates that the nurse's task and responsibility is facilitating and also acting as the agent of change, (Lippincott, et al., 2011). The main goal of nursing care is to help the patient be in charge and also become independent in his or her self-care, (Lippincott &Wilkins, 2011).To be able to organize and perform their self-care, patients need education, mental and practical skills and also motivation. This study hence applied Orem's theoretical framework to investigate if the patients had capacity to control their diabetes and maintain their health.

2.2 Conceptual framework

This study conceptualizes that factors such as demographic factors, cultural factors, social-economic factors, clinical factors, social support status and diabetic patient knowledge level (independent variables) affects the level of adherence to recommended self-care practices for a person living with diabetes (dependent variable).
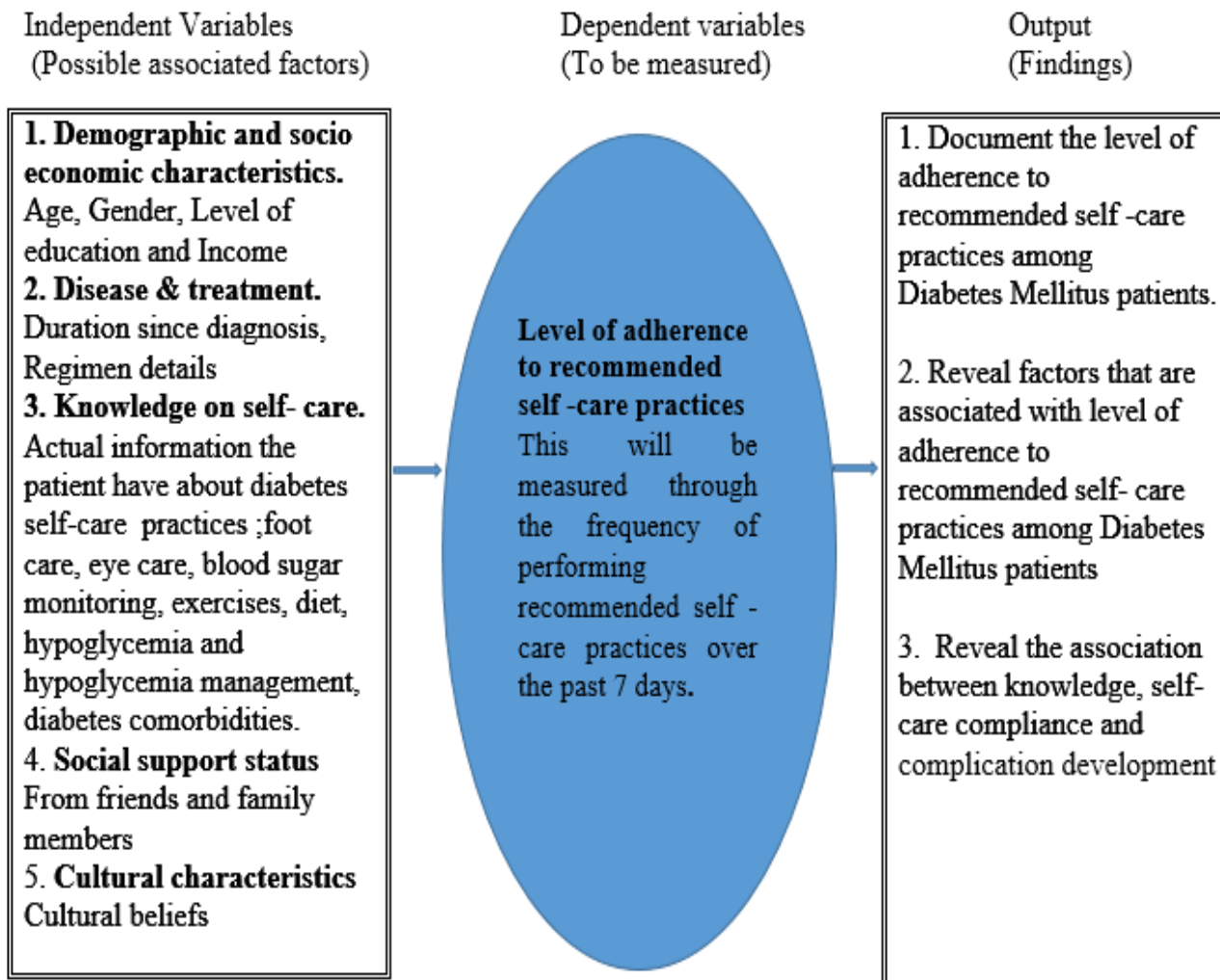
Independent Variables
(Possible associated factors)

Dependent variables
(To be measured)

Output
(Findings)

1. Demographic and socio economic characteristics.
Age, Gender, Level of education and Income
2. Disease & treatment.
Duration since diagnosis, Regimen details
3. Knowledge on self- care.
Actual information the patient have about diabetes self-care practices ;foot care, eye care, blood sugar monitoring, exercises, diet, hypoglycemia and hypoglycemia management, diabetes comorbidities.
4. Social support status
From friends and family members
5. Cultural characteristics
Cultural beliefs

Level of adherence to recommended self -care practices
This will be measured through the frequency of performing recommended self - care practices over the past 7 days.

1. Document the level of adherence to recommended self -care practices among Diabetes Mellitus patients.

2. Reveal factors that are associated with level of adherence to recommended self- care practices among Diabetes Mellitus patients

3. Reveal the association between knowledge, self-care compliance and complication development

Figure 1: conceptual framework

2.3 Literature Review

Diabetes is a chronic condition characterized with chronic hyperglycemia which may end up damaging major human organs as the majority of people with diabetes mellitus remain for a long time unaware of the complication, (ADA, 2013). Its management would need sufficient levels of knowledge, self-care behaviour and adherence to medications, (Fitzgerald, et al., 2016) . Patients therefore, need to adopt various skills and behaviour that helps in glycemic control and protects against complications. Knowledge of diabetes self-care practices has been seen to nurture adherence to medications and proficiency to diabetes self-care management practices which in turn plays a vital role in the management of diabetes, (Formosa & Muscat, 2016). However, previous studies of diabetes education programs have reported conflicting results regarding outcomes, Increase in knowlegde on diabetes self-care practices alone has been recognized not to be sufficient to enhance adherence to patient's self-care practices, (Amiri et al., 2016).

Several diabetes educational programs that also address behavioral or psychosocial aspects have been shown to improve the patients' outcomes successfully. (Lippincott et al., 2011). Several guidelines have also been published such as the American Diabetes Association, the American Association of Diabetes Educators and International Diabetes Federation, indicating the methodology on how diabetes education should be implemented. Despite these guidelines being widely available, implementation of patient education activities have been varying in different countries, and most use primarily didactic education (Lamis et al., 2015). This inconsistency has resulted to only about 50% to 80% of persons living with diabetes worldwide having inadequate knowledge regarding the management of diabetes and adherence to self-care, (Khattab et al., 2010)

Few research studies have focused on the factors that contribute to poor knowledge level and adherence to the recommended diabetes self-care practices which are significant for improving diabetes outcomes. Furthermore, few research studies have been done in Kenya regarding the knowledge level and self-care practices among diabetes patients and besides, no research findings have yet been published from Kiambu County.

This research aimed to address the lack of understanding regarding nature and factors that determine both the level of diabetes-related knowledge and the adherence to diabetes self-care practices in patients living with Type 2 diabetes. We hypothesized that patient's characteristics have no effect on both the level of knowledge and adherence to self-care practices among people living with Type 2 diabetes. Information gathered will help inform the future development of educational interventions that are more effective in the management of diabetes.

3.0 METHODOLOGY

The data was collected from the month of November 2019 to January 2020 at Thika Level 5 Hospital diabetic clinic. A cross-sectional study design was used in this study where a simple random sampling technique was used to select 190 respondents who were then recruited to participate in the study. Eligible study participants were patients with Type 2 diabetes. The study relied on primary data basing on the fact that few of the related studies in Kiambu had been done and therefore using and relying on secondary data would not be appropriate. An interviewer-administered questionnaire was designed for data collection. This was done through the help of diabetes validated data collection tools. The data was then analyzed using SPSS version 21. Descriptive statistical analysis was used to calculate the percentages, means and standard deviations of the patient's characteristics, knowledge level and level of proficiency in diabetes self-care practices. Chi-square test statistic was used to test for the association between the patient's characteristics and knowledge level of diabetes self-care practices and also the relation between patient's characteristics and level of proficiency to self-care practices. Pearson correlation analysis was used to assess the relationship between the level of adherence to diabetes self-care practices and knowledge of diabetes self-care practice.

4.0 RESULTS AND DISCUSSION

4.1 Response Rate

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Table 1: Response Rate

Response	Frequency	Percent
Returned	190	95%
Not returned	10	5%
Total	200	100%

As indicated in Table 1, 200 questionnaires were administered to patients attending diabetic clinic at Thika level V Hospital. The numbers of questionnaires returned, correctly filled and accepted by the researcher were 190 in number (95% of the administered questionnaires). Since a response rate of above 50 % is permissible for analysis (Babbie & Rubin, 2008) it was therefore correct to analyze data from the returned 190 questionnaires.

4.2 Results

4.2.1 Social demographic characteristics of the study participants

Table 2:Social demographic characteristics of the study participants.

Variable	Frequency	Percentage %
Respondents ages in years (N=190)		
18-35 years	14	7.4
35- 50 years	61	32.1
Above 50	115	60.5
Gender of the respondents (N=190)		
Male	58	30.5
Female	132	69.5
Marital status of the respondents (N=190)		
Married	162	85.3
Single	14	7.4
Divorced	7	3.7
Widowed	7	3.7
Social support status of respondents with diabetes (N=190)		
5 and above score	66	34.7
less than 5 score	124	65.3

Table 2 show that majority of the study participants were above 50 years old forming 60.5% of the study population. Almost three quarters of the study participants were female (69.5%). More than three-quarter of the study respondents (85%) were married and 65.3% of the study population scored less than half of the total social support scores (65.3%).

4.2.2 Social cultural characteristics

Table 3: Social cultural characteristics of respondents with diabetes

Variable	Frequency	Percentages
Beliefs that herbal medicine can cure diabetes (N=190)		
Yes	26	13.7
No	163	85.8
I don't know	1	.5
Belief that faith to cure diabetes (N=190)		
Yes	82	43.2
No	108	56.8

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While only 13.7% believed that herbal medicine can cure diabetes, 43.2% believed that religious faith could cure diabetes. This is with reference to data presented on table 3.

3.2.3 Economic characteristics of the study respondents

Table 4: Economic characteristics

Variable	Frequency	Percentages
Employment status N=190		
work at home	41	21.6
Farmer	69	36.3
business person	48	25.3
formally employed	32	16.8
Means of payment of medical bills N=190		
income/pension	89	46.8
friends and family support	54	28.4
saved money	43	22.6
selling property	4	2.1

Table 4 indicates that farming was the major economic activity practiced by majority of the study population (36.3%) and income and pension was the main means of payment of medical bills (46.8%) used by majority of the respondents.

3.2.4 Clinical characteristics of the study participants

Table 5: Clinical characteristics of the study participants

Variable	Frequency	Percentage
Duration since diagnosis with diabetes (N=190)		
0-2 years	46	24.2
3-5 years	48	25.3
6-8 years	21	11.1
9-11 years	18	9.5
More than 11 years	57	30.0
Diabetes related complications (N=190)		
Cardiovascular diseases	99	52.1
Visual Impairment	8	4.2
Amputations	3	1.6
None	57	30.0
More than one condition	23	12.1
Type of Treatment (N=190)		
Insulin	49	25.8
oral antidiabetic agents	105	55.3
Insulin and oral antidiabetic agents	34	17.9
Diet	2	1.1
Do the patient have a glucometer		
Yes	62	32.6
No	128	67.4

As presented in table 5, patients who had lived with diabetes for more than 11 years since diagnosis were the majority (30%). More than half of the participants suffered from cardiovascular diseases, in addition to diabetes (52.1%). However, a substantial percentage, (30%) of the study population did not have any diabetes related complications. Majority of the study population (55.3%) were on oral

antidiabetic agents, with only 25.8% using insulin. On the other hand, 68% did not have a glucometer for self-glucose monitoring.

3.2.5 Knowledge level of diabetic self-care practices as assessed by Spoken Knowledge in Low Literacy in Diabetes Questionnaire (SKILLD)

Table 6: Knowledge level diabetic self-care practices

Variable	Frequency	Percentage
Knowledge on diet N=190		
Have knowledge	147	77.4
limited knowledge	43	22.6
Knowledge on hyperglycemia signs and symptoms N=190		
Have knowledge	120	63.2
Have limited knowledge	70	36.8
Do not have any knowledge	1	0.5
Knowledge on hypoglycemia signs and symptoms N=190		
Have knowledge	89	46.8
Have limited knowledge	98	51.6
Do not have any knowledge	3	1.6
Knowledge on management of hypoglycemia N=190		
Have knowledge	84	44.2
Do not have knowledge	106	55.8
Frequency of foot care N=190		
Knowledgeable	127	66.8
Have no knowledge	63	33.2
Knowledge on importance of foot care N=190		
Have knowledge	130	68.4
Do not have knowledge	60	31.6
Knowledge on eye care N=190		
Have knowledge	107	56.3
Do not have knowledge	83	43.7
Knowledge on frequency of blood sugar test N=190		
Knowledgeable	71	37.4
Do not have knowledge	119	62.6
Knowledge on Random blood glucose levels N=190		
Knowledgeable	104	54.7
Do not have knowledge	86	45.3
Knowledge on Fasting blood sugar levels N=190		
Knowledgeable	85	44.7
Do not have knowledge	105	54.3
Knowledge on HBAIC N=190		
Knowledgeable	43	23.6
Do not have knowledge	147	76.4
Knowledge on the frequency of exercises N=190		
Knowledgeable	99	52.1
Do not have knowledge	91	47.9
Knowledge on long term complications associated with uncontrolled diabetes N=190		
Knowledgeable	121	63.7
do not have knowledge	69	36.3

From table 6, more than three quarters (77.4%) of the study population had adequate knowledge on the appropriate diet for a person with diabetes. With more than half (63.2%) being able to recall at least 2

clinical signs and symptoms of hyperglycemia. However, more than half of the study population were unable to recall at least 2 signs and symptoms of hypoglycemia (51.6%) and in fact, 55.8% of the patients did not know how to deal with hypoglycemia complications. Conversely, when they were given signs and symptoms of hypoglycemia and asked what they normally do when they experience them, 61.2% of them reported that they either rested or ate any form of sugar.

Majority of the patients acknowledged that diabetic patient should check their feet for complications daily (66.8%). It is no wonder that more than half (68.4 %) of the study population knew the importance of wearing flat and closed shoes 68.4% as presented in table 5. When participants were asked whether eye check-ups for at least once annually was important, 56.3% were in agreement. On other hand, about a third (62.6%) of the study population had no right knowledge on the frequency of blood glucose level monitoring even though more than half (54.7%) of the study population showed adequate knowledge on the normal random blood glucose levels. Conversely, 54.3% and 76.4% were not aware of the normal fasting blood glucose level and the existence of HbAIc blood sugar test, respectively. However, a third (63.7 %) of the study population were able to recall at least 2 complications of uncontrolled diabetes.

3.3 Proficiency to Diabetic Self-Care Practices

3.3.1 Self-care practices as assessed by the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA)

Table 7: Self-care practices as assessed by The Summary of Diabetes Self-Care Activities Questionnaire (SDSCA)

VARIABLE	Frequency of respondents who adhered to the self-care practice	percentage of respondents who adhered to the self- care practice	Mean/SD
Diet plan	68	35.8	3.7 0±3.2
Intake of at least 5 servings of vegetables	26	13.7	4.6 ± 2.8
Adherence to insulin use	85	90.4	6.5 ± 1.6
Adherence to antidiabetic drugs use	144	88.9	6.5 ± 1.7
Feet check	53	27.9	4.4 ± 3.2
Use flat closed shoes	128	67.4	1.7 ± 2.8
Dried between toes after washing	154	81.1	6.0± 1.2
Usual exercise of at least 30min	121	63.7	4.9 ±.2.9
specific exercise other than usual exercises	41	21.6	0.9 ± 2.1
Blood sugar monitoring of at least once in the previous week	71	37.4	1.0 ± 1.8

Note. In this research, respondents were asked to recall the number of days they practiced specific recommended self-care practices for the past one week. Forty five respondents were not on antidiabetic drugs and 87 respondents were not using insulin

From Table 7, 35.8% of the respondents followed a specific diet plan however a substantive number (44.7%) of them did not follow any diet plan at all. Also, the mean number of days where a diet plan was followed by all patients was 3.7 days. In fact, half of the study population (54.2%) failed to consume at least 5 servings of vegetables in a day for the previous week with only 13.7% of the study population reporting consumption of at least 5 servings of vegetables per day over the past one week. Indeed, the mean number of days where all the patients consumed at least 5 servings of vegetables a day

was 2.8.The respondents presented with good adherence to medication as 90.4% and 88.9% of the respondents had 100% adherence to antidiabetic drugs and insulin respectively.

As presented in table 7, the mean number of days where patients checked their feet for infections was 4.4 days. With slightly about one-third (27.9%) checking their feet at least once a day, however more than half of the patient (56.8%) did not check their feet at all in the previous one week. More than half 67.4%) of the respondents reported wearing flat and closed shoes during the previous one week and the mean number of days that patients wore flat and closed shoes was 1.7 days. Additionally, more than three quarters of the respondents (81.1%) dried in between their toes. The mean number of days where the patients dried in between their toes was 6 days.

A very small proportion (2.4%) of the study population were smokers. On the other hand, more than half of the respondents (62.6%) did not monitor their blood sugar levels even once in the previous week. This could have been as a result of lack of a glucometer since only 32.6% had glucometer at home with the rest checking their blood glucose in the nearby pharmacy and health care centers.

3.3.2 Medical adherence as assessed by the Modified Morisky Medication adherence scale

Table 8: Medical adherence as assessed by the modified morisky medication adherence scale

Variable	frequency	percentage
Number of respondents who sometimes forgets to take oral antidiabetic agents N=145		
Yes	20	14
No	125	86
Number of respondents who sometimes forgets to use insulin N=103		
Yes	14	13.6
No	89	86.4
Number of respondents who stop using insulin and oral antidiabetic agents the moment they feel better N=190		
Yes	31	16.3
No	159	83.7

Note. Respondents were asked whether they sometimes forget to use either diabetic drugs or insulin .Forty five respondents were not on oral diabetic pills and 87 respondents were not on insulin.

With reference to table 8, the respondents were keen on adherence to medical therapy as more than three quarters of the study population had good adherence to both Insulin and oral antidiabetic agents that is 86.4% and 86% respectively. Only 16.3% acknowledged to stop using insulin and oral antidiabetic agents the moment they feel better.

3.3.3 Factors influencing the knowledge level of diabetes self-care practices

Table 9: Influence of demographic characteristics on knowledge to self-care practices

Variable	Adherence to self-care practices (*percentages*)		
	Low	Moderate	High
Age χ^2 (4, N=190) = 10.189, p = .04			
18-35 years	0	35.7	64.3
35-50 years	16.4	49.2	34.4
Above 50 years	20.9	50.4	28.9
Gender χ^2 (2, N=190) = 4.363, p = .11			
Male	12.1	44.8	43.1
Female	20.5	50.8	28.9
Marital status χ^2 (6, N=190) = 9.24, p = .16			
Married	18.5	50.6	30.9
Single	0	42.9	57.1
Divorced	28.6	28.6	42.9
Widowed	28.6	42.9	28.6
Education level χ^2 (6, N=190) = 17.861, p = .007			
non-formal education	32.1	53.6	14.3
primary school	20.7	50	29.3
secondary school	11.3	49.1	39.6
tertiary school	0	35.3	64.7
Belief that Religious faith and herbal medicine would cure diabetes, χ^2 (4, N=190) = 2.014, p = .733			
Yes	13.4	46.3	40.2
No	21.3	50.9	27.8
Employment status χ^2 (6, N=190) = 16.655, p = .01			
work at home	24.4	48.8	26.8
Farmer	17.4	58	24.6
business person	18.8	50	31.3
formally employed	9.4	28.1	62.5
Duration since diagnosis χ^2 (8, N=190) = 12.941, p = .11			
0-2 years	21.7	50	28.3
3-5 years	14.6	50	35.4
6-8 years	38.1	52.4	9.5
9-11 years	11.1	50	38.9
more than 11 years	17.9	48.9	33.2
Presence of comorbidities, χ^2 (8, N=190) = 12.127, p = .14			
Cardiovascular	17.2	45.5	37.4
visual impairment	37.5	50	12.5
Amputations	0	66.7	33.3
None	12.3	61.4	26.3
more than one condition	30.4	30.4	39.1

In assessing the associations among knowledge of diabetes self-care practices as assessed by Spoken Knowledge in Low Literacy in Diabetes Questionnaire (SKILLD), demographic characteristics, economic factors and clinical factors (table 9), the following chi-square test results were found. Statistically significant associations were found between knowledge of diabetes self-care practices and age, (χ2 (4, N=190) = 10.189, p = .037), education level, (χ2 (6, N=190) = 17.861, p = .007), employment status, (χ2 (6, N=190) = 16.655, p = .011). On the other hand, there was no statically significant associations found between knowledge of diabetes self-care practices and gender, (χ2 (2, N=190) = 4.363, p = .113), marital status, (χ2 (6, N=190) = 9.24, p = .161), belief that Religious faith

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and herbal medicine would cure diabetes, (χ2 (4, N=190) = 2.014, p = .733). Similarly a chi-square test results of the association between durations since diagnosis and presence of co-morbidities with knowledge of diabetes self-care practices showed no statistical significance, (χ2 (8, N=190) = 12.941, p = .114), (χ2 (8, N=190) = 12.127, p = .147) respectively.

3.3.4 Barriers to adherence to recommended diabetes self- care practices amongst diabetic patients

Table 10:Barriers to adherence to recommended diabetes self- care practices amongst diabetic patients

Variable	Knowledge level (*percentages*)		
	Low	Moderate	High
Age χ^2 (4, N=190) = 4.501, p = .034			
18-35 years	0	71.4	28.6
35-50 years	1.6	73.8	24.6
Above 50 years	5.2	78.3	16.5
Gender χ^2 (2, N=190) = 0.075, p = .963			
Male	3.4	77.6	19.0
Female	3.8	75.8	20.5
Marital status χ^2 (6, N=190) = 7.724, p = .269			
Married	3.1	79	17.9
Single	7.1	57.1	35.7
Divorced	14.3	42.9	42.9
Widowed	0.0	85.7	14.3
Education level χ^2 (6, N=190) = 15.616, p = .016			
non-formal education	7.1	82.1	10.7
primary school	4.3	82.6	13.0
secondary school	0.0	67.9	32.1
tertiary school	5.9	58.8	35.3
Belief that Religious faith and herbal medicine would cure diabetes, χ^2 (2, N=190) = 5.012, p = .078			
Yes	4.9	68.3	26.8
No	2.8	82.4	14.8
Employment status χ^2 (1, N=190) = 3.830, p = .005)			
work at home	7.3	73.2	19.5
Farmer	2.9	82.6	14.5
business person	4.2	77.1	18.8
formally employed	0.0	65.6	34.4
Duration since diagnosis χ^2 (8, N=190) = 6.493, p = .592			
0-2 years	4.3	69.6	26.1
3-5 years	2.1	81.3	16.7
6-8 years	4.8	85.7	9.5
9-11 years	11.1	72.2	16.7
more than 11 years	1.8	75.4	22.8
Presence of comorbidities, χ^2 (8, N=190) = 8.406, p = .395			
Cardiovascular	4.0	79.8	16.2
visual impairment	12.5	62.5	25.0
Amputations	0	33.3	66.7
None	3.5	77.2	19.3
more than one condition	0.0	69.6	30.4

With reference to table 10, the association among adherence to recommended diabetes self- care practices as assessed by the summary of diabetes self-care activities questionnaire (SDSCA) and demographic characteristics, economic factors and clinical factors was assessed. Statistically significant association was found between adherence to recommended diabetes self- care practices and age, χ^2 (4, N=190) = 4.501, p = .034, education level, χ^2 (6, N=190) = 15.616, p = .016, employment status, χ^2 (1, N=190) = 3.830, p = .005. On the other hand, there was no statically significant associations found between knowledge of diabetes self-care practices and gender, χ^2 (2, N=190) = 0.075, p = .963), marital status, χ^2 (6, N=190) = 7.724, p = .269, belief that Religious faith and herbal medicine would cure diabetes, χ^2 (2, N=190) = 5.012, p = .078. Similarly a chi-square test results of the association between durations since diagnosis and presence of co-morbidities with adherence to recommended diabetes self-care practices showed no statistical significance, (χ^2 (8, N=190) = 6.493, p = .592), χ^2 (8, N=190) = 8.406, p = .395) respectively.

3.4 Correlation among knowledge of diabetes self-care practices level, social support status with adherence to self-care practices

Table 11: Relationship between knowledge of diabetes self-care practices level, social support status and adherence to self-care practices

Correlations	knowledge level of the patient	the patients level of adherence	Social support
knowledge level of the patient	1		
the patients level of adherence	.367**	1	
Social support		-.004	1

Note. **. Correlation is significant at the 0.01 level (2-tailed).

As indicated in table 11, the Pearson correlation analysis results indicated that the relationship between the level of adherence to diabetes self-care practices and knowledge of diabetes self-care practices was positive, weak in strength and statistically significant r (188) =0.367, p=< 0.01. On the other hand, the correlation between level of adherence to diabetes self-care practices and patient's level of social support score was negative, weak in strength and not statistically significant r (188) =-0.004, p=.957.

3.5 Discussion

Associations among knowledge of diabetes self-care practices with demographic characteristics, economic factors and clinical factors

Chi-square test was used to assess the association between demographic, economic and clinical factors and knowledge of self-care practices (table 8).The statistically significant association between age and knowledge level to diabetes self-care practices indicated that knowledge of diabetes self-care practices decreased with age, (χ^2 (4, N=190) = 10.189, p = .037). Young people tend to have more knowledge on self-care practices, good cognitive function, more likely to retain what they were taught and less hindering factors to effective self-care practices compared to their old counterparts' education, (Adisa, 2009). This indicates that older people were at a higher risk and thus there would be a need to develop targeted programs to address the inequity that existed between age groups. Similar results were indicated in a study done in Kenya here middle-aged females were seen to adhere to self-care practices including regular medical checkups, (Gesare, 2016).

Knowledge of diabetes self-care practices seemed to increase with the level of education, (χ^2 (6, N=190) = 17.861, p = <.01) where patients with a tertiary level of education being more knowledgeable (Table 9). This is not unexpected as knowledge is attained through education. These findings were consistent with other studies from a cross-sectional survey in Ethiopia, where a significant difference in the low level of knowledge of diabetes was observed among illiterates than those who attained higher secondary education, (Eshetie, et al., 2016).

Employment status showed a statistically significant association with the level of knowledge of diabetes self-care practices where respondents formally employed being more knowledgeable employment status, (χ^2 (6, N=190) = 16.655, p = .011). Since the majority of formally employed individuals have higher educational levels, these results are not surprising as knowledge is gained through education (Formosa, 2016).

Associations between social-demographic, economic and clinical factors influencing adherence to diabetic self-management practices

Adherence seemed to decrease with age (χ^2 (4, N=190) = 4.501, p = .03). Young people tend to put into action knowledge of the recommended diabetes self-care practices, have a good cognitive function, more likely to retain what they were taught and less hindering factors to effective self-care practices compared to their old counterparts, (Adibe et al.,2014). Similar results were indicated in a study done in Kenya were middle-aged patients were seen to adhere to self-care practices including regular medical checkups, (Gesare,2016)

There was strong evidence indicating the level of proficiency in diabetes self-care practices seemed to increase with a rise in educational level, (χ^2 (6, N=190) = 15.616, p = .01). Respondents with lower education status have been reported to have low self-management behaviour, lower self-efficacy and lower continuity of care, (Gurmu, et al., 2018). This finding was consistent with other studies from the United Arab Emirates (UAE) and Bangladesh, (Islam, et al., 2015). It is therefore important to note that measures to improve literacy level would be cost-effective to reduce diabetic morbidity and mortality, (Chali, et al., 2018).

Formally employed individuals had a high level of proficiency in self-care practices compared to all others, ($\chi2$ (1, N=190) = 3.830, p = <.01). This could be related to the level of education as it was obvious that the majority of individuals formally employed had higher educational levels as compared to farmers and house-wives. Furthermore, low socioeconomic status is associated with limited access to education, information and transportation, which are necessary drivers to required necessary services including medications, (Mayberry & Osborn, 2012).

Association between knowledge level and proficiency to self-care practices

The weak positive correlation between knowledge level to diabetes self-care practices and adherence indicated an increase in knowledge raised the level of adherence to diabetes self-care practices. The ability to retain the knowledge and apply it to real-life situation is reported to improve behavioral change among patients, (Kones, 2016). The results were consistent with the previous study's findings where knowledge had a significant effect on self-care behaviour and adherence to medications, (Ayele et al., 2012).

5.0 CONCLUSION AND RECOMMENDATION

Conclusion

The majority of the respondents had a moderate level of awareness of diabetic management however this awareness failed to lead to full adherence to self-care practices for diabetes management. This could have been as a result of the patients not being sufficiently equipped with the knowledge to comprehensively manage their disease.

The levels of knowledge might have been ascribed to patient inherent characteristics which were significantly associated with the level of knowledge. This included, the respondents being young, educated, having lived with the disease for a long duration of time. The presence of social support from friends and family members also showed a significant relationship with knowledge level. Knowledge deficit was evident in, awareness of hypoglycemia signs and symptoms, frequency of blood sugar test, the normal levels for fasting blood sugar levels and awareness of the existence of HbAIc tests.

The majority of the patients showed a moderate level of proficiency in self-management practices. This could be ascribed to age, level of education and employment status. Areas that showed a low level of proficiency included, adherence to diabetic diet plan, foot care and blood glucose monitoring.

From the study findings, we can conclude that management of diabetes requires a comprehensive approach where patients should be enriched by all stakeholders with knowledge, training, motivation and support.

Recommendation

The study results stimulate discourse about what is crucial to improve self-care practices in this population. Innovative approaches to education and care are required to help diabetic patients make necessary changes in their lifestyle that could lead to improved health outcomes. Flexible self-practices interventions that are responsive to daily individuals' unique needs are recommended.

It's recommended that health care providers shift from the infamous traditional biomedical model of care and traditional didactic diabetes-related education approach, which has been shown to fail in a variety of settings to the adoption of the innovative, patient-centered biopsychosocial model of care. This could be achieved by listening more carefully to the unique needs of each individual attending the diabetic clinic, showing empathy, and supporting and equipping patients with the necessary skills required during consultation visits to help them adapt to the necessary changes required in their daily health behaviors.

Health-care service providers and regulators need to allocate more resources to address this problem because it is clear that in the diabetic clinic, the patients may not be receiving adequate education and skills training to help manage effectively the disease. A shortage of health care professionals also hinders the effective teaching of diabetes self-management education to patients as a result of busy clinic schedules. In addition, more research is warranted to explore patients' perceptions and attitudes towards the effectiveness of their self-care management so that resources for diabetes education can be tailored according to patients' needs.

Abbreviations and Acronyms

WHO- World Health Organization

DM- Diabetes Mellitus

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NCDs- Non-Communicable Diseases

ADA- American Diabetes Association

MOPHS- Ministry of Public Health and Sanitation

IDF- International Diabetes Federation

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