

Self- Efficacy and Self- Care Practices, In Glycemic Control among Adults with Diabetes Mellitus Receiving Care at Kitwe Teaching Hospital, Kitwe, Zambia

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ABSTRACT

Diabetes mellitus is a major public health problem that is approaching epidemic proportions worldwide. Uncontrolled disease can lead to complications which can eventually result in reduced life expectancy and major health cost. Glucose control is fundamental in delaying the onset of complications as such patients are required to practice regular self-care in order to achieve optimal blood glucose levels and prevent complications. Higher self-efficacy has been shown to contribute to improved self-care behaviour and better glycaemic control. The study therefore sought to evaluate the relationship between self- efficacy and self- care practices, in glycemic control among adults with diabetes mellitus, receiving care at Kitwe Teaching Hospital, Zambia.

A cross sectional correlational study design was utilized. A total of 112 patients participated in a study. They were selected using a simple random sampling method. A structured interview schedule was used to collect data on self-care practice. Self-efficacy was measured using a modified Diabetes Self-efficacy Scale and glycemic control was obtained by calculating the average of three consecutive fasting blood sugar results. Data was entered and analyzed using the Statistical Package for Social Sciences (SPSS) for Windows version 25.0. The Chi-square and Fisher's exact tests were used to test the associations between variables. The Binary logistic regression was used to determine the true predictor variables to glycemic control.

The study results showed that more than three quarters (79.4%) of the participants had poor glycemic control, more than half (61.6%) of the participants had high self-efficacy and about two thirds (66%) of the participants practiced good self-care. The study results showed a statically significant relationship between glycaemic control and self-efficacy $p < 0.001$. The finding of the binary logistic regression analysis was statistically significant ($p < 0.01$) as it showed that patients who practiced good self-care had 6.64 times greater odds of glycaemic control (OR: 6.64, CI: .46, .88). There is, therefore, need to strengthen the educational programs with emphasis on self-care activities to help achieve normal glycaemic levels. Self-efficacy should also be incorporated in the diabetic treatment protocols as it enhances self-care practice.

Keywords

Diabetes mellitus, Self-efficacy, Self-care practice, Glycemic control.

healthcare expenditure [1]. Complications can lead to an increased prevalence of coronary artery disease, peripheral vascular diseases, stroke as well as retinopathy and nephropathy [2].

Background

Diabetes mellitus is a syndrome of chronic hyperglycemia due to relative insulin deficiency, resistance or both. The disease causes both macrovascular and microvascular complications which eventually result in reduced life expectancy and ever-increasing

Diabetes mellitus is a major public health problem that is approaching epidemic proportions worldwide. The prevalence of Diabetes is increasing rapidly; with an estimated 463 million (9.3%) adults aged 20 to 79 living with Diabetes mellitus worldwide [3]. Additionally, data indicates that around 4 million deaths were

attributed to Diabetes mellitus annually [4]. The International Diabetes Federation estimated that 382 million people had diabetes in 2013, and the number is projected to increase to 592 million by 2035 [3]. In Zambia, Diabetes mellitus has been reported as one of the common non communicable diseases (NCD) which is increasing. In 2019, 274 thousand out of 8million adults (3.4%) in Zambia had Diabetes mellitus, [3]. The STEPs survey conducted in four selected districts reported that 8% of the studied population had raised blood sugars, with 3% Diabetes prevalence in males and 4% in females.

A multifaceted approach is therefore recommended and with the disease being chronic, patients play a significant role in the management, Dinesh et al. [5] Individuals suffering from Diabetes mellitus are required to follow certain self-care practices to achieve euglycaemic state and prevent complications [6]. These practices include regular physical activity, appropriate dietary practices, compliance with treatment regimen, and tackling complications such as hypoglycaemic or hyperglycaemic episodes [5]. Regular practice of these activities is associated with good outcomes among people with diabetes mellitus. Development of diabetes complications is mainly influenced by poor awareness and practices among patients with diabetes mellitus. Therefore Health education should be enhanced in order to increase awareness, additionally health facilities should come up with strategies to address these challenge. Blood glucose control plays a significant role in delaying the onset of complications. Uncontrolled Diabetes mellitus can put the patient at risk for a host of complications that can affect nearly every organ in the body resulting from damaged blood vessels, nerves, or both. These complications include cardiac failure, retinopathy, nephropathy, neuropathy and the gums and teeth disorders, Almetwazi, et al., [2]. Successful daily self-management of Diabetes is essential to the achievement of positive health outcomes. Ultimate to successful self-management of any disease is a sense of self-efficacy, a feeling of confidence in ones self-management abilities [7]. According to Bandura [8], Self-efficacy is defined as people's belief about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Enhanced self- efficacy has a bearing on improving patient self- management. Self-efficacy affects patients' ability to perform self-care in a positive or negative way. Patient self-efficacy has been shown to positively contribute to improved self-care behaviour and better glycaemic control Tharek et al., [7]. Self-efficacy is the most consistent predictor of all adherence behaviors [9] It is evident that patients suffering from Diabetes mellitus require a lot of support in terms resources, information and confidence in order to carry out self-care effectively. High level of self-efficacy and adherence to self-care activities has a positive impact on the achievement of glycaemic goal among Diabetic patients Amer et al., [10]. Hence, patients should be taught on the activities that promote self-management in order to delay onset of complications and thus promote the quality of life .Amer et al., [10] also concluded that Self-efficacy was significantly associated with adherence to self-care activities and glycaemic control. It is apparent that patients who have high self-efficacy have a positive attitude towards caring out the self-care

activities that promotes health behaviors. According to a study conducted by Musenge, et al., [11], there was poor glycaemic control status among Diabetic patients which was associated with adherence to anti-diabetic treatment related factors. Although there is a rise in diabetes mellitus cases in Zambia, data on self -efficacy, self-care practices and glycaemic control remain limited. Therefore this study was designed to evaluate the relationship between self- efficacy and self-care practices in glycaemic control.

Material and Methods

Study design, setting and Participants

A cross sectional correlational study design was used to evaluate the relationship between self-efficacy and self-care practice in glycemic control. The study was conducted at Kitwe Teaching Hospital, a third level Hospital that provides specialized health care in various disciplines including Diabetes management. The population for the study comprised of all confirmed Diabetic patients male and female aged 18 years and above, who resided within Kitwe Teaching Hospital catchment area. Participants were recruited from the Outpatient Medical Clinic. All the confirmed type 1 or 2 Diabetic patients who were diagnosed for 1 year and above, and were aged 18 years and above were included in the study. The study participants were selected using simple random sampling method. They were considered eligible if they had Diabetic mellitus for over a year, aged 18 years and above, had blood glucose results and consented to participating in the study. The study excluded patients who were very sick at the time data collection and could not stand the interview. Patients who were newly diagnosed at the time of the interview were excluded from the study as well.

Data Collection Procedure

Ethical approval was sought from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) reference number-1104-2020. and National Health Research Authority (NHRA) Reference number NHRA000013/14/09/2020. Data was collected in a quiet private room using a structured interview schedule adapted from Diabetes Self-Management Questionnaire (DSMQ) and Self-efficacy for Diabetes Scale. Participants were assured of anonymity, confidentiality and informed that participation in the study was voluntary, therefore they were free to terminate contract any time if they so wished.

Instruments

A structured interview schedule was used to collect data on Self-Care Practices and Self- Efficacy. The interview schedule had been developed based on the Diabetes Self-Management Questionnaire (DSMQ) which was validated by Schmitt et al., [12] and had the cronbach's alpha of 0.84. Self-efficacy was measured using a validated Diabetes Management Self-efficacy Scale, the tool was validated by Messina et al., [13], and the Cronbach's alpha was 0.81. No permission was required for reuse of the two instruments because they are distributed under the terms of the Creative Commons CC BY license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited [13]. Data

on fasting plasma glucose (FPG) was obtained from a review of participant's medical records for the last two consecutive fasting blood sugar readings, and measurement of blood sugar on the day of data collection.

The structured interview schedule comprised of a series of closed ended questions and had three sections as follows; Section A had questions on demographic data, Section B assessed self-care practice activities and Section C assessed self-efficacy using a modified Diabetes Management Self-efficacy Scale.

Data from medical records were captured using a self-made instrument. The instrument comprised of two parts; Part A had patient's particulars including; serial number, year of diagnosis, type of diabetes and Part B captured information for plasma glucose measurement for the last three consecutive months and the average.

Data Analysis

Data were collected, coded, entered and analyzed using the Statistical Package for Social Sciences (SPSS) for Windows version 25. Chi-Square was used to test the association between the predictor variable, (self-efficacy and self-care practices) and outcome variables (Glycaemic control). For those cells having a frequency of less than 5 a fisher's exact test was used. The confidence interval (CI) of 95% was set and a P- value of 0.05 or less was considered statistically significant. The binary logistic regression analysis was used to determine true predictor of glycemic control.

Results

The interview was conducted on 112 participants of whom more than three quarters (79.5%) were female. Close to half (48.2%) were aged 60 years and above. Half of the participants (50.0%) were married. Close to half of the participants (45.5%) had attained secondary education. Furthermore, (45.5%) of the participants were self - employed and 29.5% were unemployed.

Table 1: Demographic Characteristics of participants (n=112).

Characteristic	Frequency	Percentage
Gender		
Male	23	20.5
Female	89	79.0
Total	112	100
Age		
18-29	5	4.5
30-39	12	10.7
40-49	17	15.2
50-59	24	21.4
60 and above	54	48.2
Total	112	100
Marital status		
Single	6	5.4
Married	56	50.0
Widowed	41	36.6
Divorced	9	8.0
Total	112	100

Education		
No formal education	7	6.3
Primary	43	38.4
Secondary	51	45.5
Tertiary	11	9.8
Total	112	100
Occupation		
Formal employment	14	12.5
Self-employed/business	51	45.5
Retired	14	12.5
Unemployed	33	29.5
Total	112	100

Table 1 shows that more than three quarters (79.5%) of the participants were female. Close to half (48.2%) were aged 60 years and above. Half of the participants (50.0%) were married. Close to half of the participants (45.5%) had attained secondary education. Furthermore, (45.5%) of the participants were self - employed and 29.5% were unemployed.

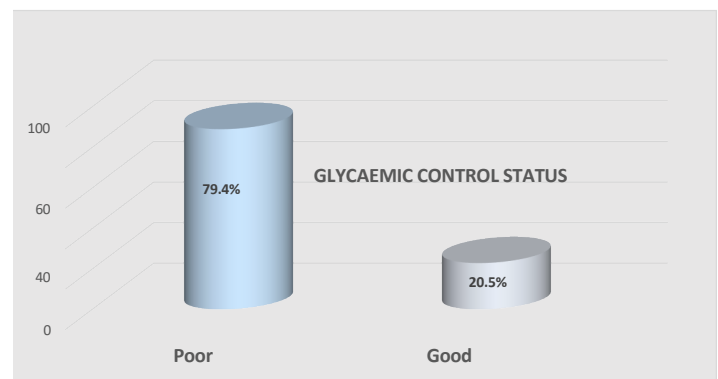


Figure 1: Participant's glycaemic control status (n=112).

Figure 1 above shows data on the participant's glycaemic control status, data was aggregated based on information from (Table 2) on average blood glucose levels. More than three quarters (79.4%) of the participants had poor glycaemic control while less than half (20.5%) had good glycaemic control.



Figure 2: Participant's overall self efficacy status (n=112).

Figure 2, shows the overall self-efficacy of Diabetes mellitus patients in performing self-care activities. The figure shows that two thirds (61.6%) of the participants had high self-efficacy, while (38.4%) had low self- efficacy.

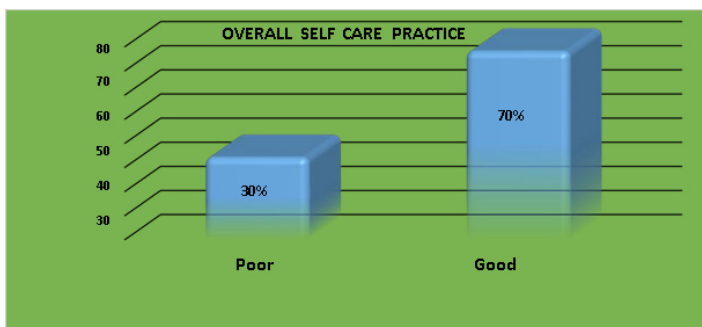


Figure 3: Overall self-care activities practiced (n=112)

Figure 3 shows that more than two thirds (70%) of the participants practiced good self-care, while (30%) practiced poor self-care.

Table 2: Relationship between glycaemic control and the overall self-efficacy (n=112).

Variable		The glycaemic control			P – Value
		Poor	Good	Total	
The overall self-efficacy	Low	43 (100%)	0 (0.0%)	43 (100%)	0.001
	High	46 (67%)	23 (33%)	69 (100%)	
The overall self-care practices	Poor	11 (32%)	23 (68%)	34 (100%)	0.001
	Good	78 (100%)	0 (0%)	78 (100%)	

Table 2 Shows that there was a statistically significant association between glycaemic control and overall self-efficacy as 23 (33%) of the participants who had good glycaemic control also had high self-efficacy. The table also shows that the 43(100%) of the patients who had poor glycaemic control had also low self-efficacy. The association was statistically significant with the $p < 0.001$. The fisher’s exact test showed a statistically significant association between the dependent and independent variables $p < 0.001$.

Table 3: Binary logistic regression analysis on the effect of Self-efficacy and Self-care practices on Glycaemic control.

Variable level	P value	Odds ratio Ex (B)	95% C.I. for EXP(B)	
			Lower	Upper
Age	.451	.779	.408	1.490
Marital status	.730	1.199	.428	3.359
Overall self-efficacy (1)	.998	2.05	1.05	3.98
Overall Self Care practice (1)	0.01	6.64	.46	.88
Constant	.734	1.331	.408	1.490

Table 3 shows the binary logistic regression test which was used to determine the impact of (predictor variables) self-efficacy and self-care practice on (outcome variable) glycaemic control. The results revealed that changes in patient’s self-care practices would contribute significantly to the regression model while changes in other variables would contribute insignificantly. The table also showed that patients who practiced good self-care activities had 66.4 times greater odds of Glycaemic control compared to those who had poor Self-care practice. (OR: 6.64, CI: .46, .88). The association was statistically significant ($p < 0.01$).

Discussion of Findings

Demographic characteristics of participants

The results in Table 1, showed that more than three quarters (79.5%) of the patients were females while (20.5%) were males. The results were similar to a study conducted by Nyirongo et al., 2021 on adherence to treatment by patients with type 2 Diabetes Mellitus which also reported that there were more females being treated for Diabetes Mellitus than males [14]. Hai et al., 2019, in their study conducted in Pakistan on Diabetes Self-care Activities and their relation with Glycemic Control also established that (72.6%) of participants were female [15]. These results could be attributed to good health seeking behaviors of women as opposed to men hence the high number of females accessing services for Diabetes Mellitus treatment. The study also determined that (48.2%) of the participants were aged 60 years and above. This is because there is an alteration in physiological activities in the elderly including the loss of first-phase insulin release [11]. Additionally, aging is associated with impaired glucose tolerance which is manifested by post prandial hyperglycemia which is a prominent characteristic of type 2 Diabetes Mellitus [16].

Glycaemic Control among Adults with Diabetic Mellitus

The findings of the current study (Figure 1) revealed that more than three quarters (79.4%) of the participants had poor glycaemic. This could be attributed to that less than half 48.2% of the participants were aged 60 years and above and mostly older patients depend on their family members especially children to help them carry out the required self- care activities. This is consistent with the Orem’s self-care model which guided the study and stated that family and social support have an effect on behavioural factors such as adherence to dietary recommendation, exercises, adhering to the prescribed treatment which in turn influences glycaemic control. The results are also in conformity to what Kassahun, et al., [17] in their study on diabetes related knowledge, self-care behaviours and adherence to medications found, respondents who were aged between 40 and 60 years were less likely to have low knowledge levels than those in age group of more than 60 years.

Another contributing factor to poor glycaemic control could be limited choice of food available for patients’ affordability as most of diabetic diets are expensive hence they could not adhere to the prescribed dietary plan and consume whatever was available. The current study also revealed that slightly more than half (55.4%) of participants reported to have been consuming carbohydrates, proteins and vitamins. The study results were consistent with a study conducted by Fiseha et al., [18] which revealed that more than two-third (70.8%) of diabetic adults had poor glycaemic control. The results were attributed to not adhering to dietary plan. Probably patients could have been exposed to a particular type of food that could not have a significant effect on glycaemic control. The current study further revealed that patients were least self-efficacious in tasks relating to adhering to the recommended diet. This could be attributed to the cost of diabetic diet as less than half (45.5%) of the participants were unemployed as a result they opted for the types of food they could afford.

The findings were similar to a study conducted by, Alzaheb and Altemani, [19] which showed a high prevalence of poor glycaemic control among patients in their study conducted in Saud Arabia. This was attributed to family history of diabetes mellitus, longer diabetes duration, low level of physical exercise, and higher body weight. In the present study, approximately two thirds (66%) of participants had relatives with diabetes mellitus and more than three quarters (80.4%) of patients had Type 2 diabetes mellitus which tend to run in families. A possible explanation of why patients with a history of type 2 diabetes mellitus are at higher risk of having poor glycaemic control is that the disease has innate genetic risk factors which have the power to influence its duration and severity hence difficult to control. Likewise a longer type 2 diabetes mellitus duration is also associated with poor glycaemic control, because of the progressive restriction of insulin secretion over time caused by B-cell failure which means that a patient's positive response to changes in diet, or oral agents, is less likely. This can be supported by a study by Geetha, et al., [20] on the impact of family history of diabetes among type 2 diabetes mellitus patients, they observed that more than two thirds (68.8%) of the participants had family history of diabetes mellitus. Similarly a study conducted by Ashur et al., [21] showed a considerable prevalence of uncontrolled and poor glycaemic control among patients with type 2 diabetes mellitus. In the same study it was noted that medications adherence was the most important behavioural predictor of glycaemic control, followed by exercise.

Contrary to the findings of the current study more than two thirds (66%) of the participants adhered to diabetes mellitus medication. Patients can be taking the drugs everyday but they may not be taking the correct dosage and the correct frequency. Moreover, diabetic medication works well with regular blood glucose monitoring. Additionally, glycaemic control is a manifold battle which requires commitment to all other self-care activities including dietary control. These results highlight the need to work more on optimum management of diabetes, as maintaining good glycaemic control is main therapeutic goal for all patients with diabetes mellitus. Further studies should be conducted to determine how much information patient receive at each visit regarding self-care practices. The study further showed a statistically significant relationship between glycaemic control and self-care practice of $p < 0.001$. The results revealed that changes in patient's self-care practices would contribute significantly to the regression model while changes in other variables would contribute insignificantly. The results further revealed that patients who practiced good self-care activities had 66.4 times greater odds of glycaemic control compared to those who had poor self-care practice. (OR: 6.64, CI: .46, .88). The association was statistically significant with ($p < 0.01$).

The observed trend in this study was found to be statistically significant as the fisher's exact test yielded a $p < 0.001$, which is greater than the threshold of 0.05. Hence, we reject the null hypothesis and conclude that there was an association between self-care practices and glycaemic control among patients with diabetes mellitus.

Overall self-efficacy in glycaemic control

In the current study the findings in figure 3 shows self-efficacy in carrying out self-care activities. In this study self-efficacy was assessed using the validated but modified Diabetic Self-Efficacy Scale. The study result showed that more than half (61.6%) of participants had high self-efficacy. The study also demonstrated a moderate high mean self-efficacy score of (4.54) and participants were found to be most self-efficacious in tasks relating to following doctor's appointment date, medication intake and judging if changes in illness means visiting the doctor or not and least self-efficacious in adhering to the recommended diet. The study findings are consistent with study conducted by Ojewale et al., [29] on Diabetes Self-Efficacy and Associated Factors among People Living with Diabetes in Ibadan, Southwestern Nigeria, they observed that more than half (55%) of the participants had a high self-efficacy level. This was attributed to educational level and having a health professional as a relative. They also noted that patients who had high self-efficacy had better glucose control. They recommended that individually tailored diabetes education and support be provided for people with poorly controlled glucose level, to improve their self-efficacy. Therefore, educational talks and programs should be intensified in clinical settings to boost the self-efficacy levels of patients at the initial stages of their disease. This would make them believe in themselves and manage the disease better on their own. Furthermore the current study also showed that half (50%) of the participants were married. This also contributed to the high self-efficacy recorded. Similarly, Reisi et al., [22] also noted that patients with Type 2 diabetic mellitus who were married and had received diabetes education performed self-care regimens successfully. Family members can be great allies of health care professionals in achieving this glycaemic control. The study also showed that less than half (45.5%) of the participants had attained secondary education. Patients with high education level easily understand health related education and counseling offered from the health facilities and are able to read and get health information through reading and internet which increases the pool of knowledge. Reisi et al., [22], also observed that communicative and critical health literate patients had better self-care activities. The study suggested that self-efficacy-enhancing strategies should be considered in diabetic management to overcome the barriers imposed by low levels of health literacy. This entails that patients should be empowered with adequate information and education needed for them to assertively manage themselves at home. Further patients should to provided with necessary resources required to confidently manage themselves. However, the current study did not explore the role of communicative and critical health literacy. Therefore further research should be conducted to determine simple and user friendly communicative health literature for diabetic patients, simple pamphlets in various languages should be developed.

The cross tabulation between glycaemic control and self-efficacy showed a statistically significant association as about 33% of the participants who had good glycaemic control also had high self-efficacy. It further showed that the 43(100%) of the patients

who had poor glycaemic control also had low self-efficacy. The observed trend was statistically significant as the fisher's exact test $p < 0.001$. The yielded a $p < 0.001$, which is less than the threshold of 0.05. Hence, we reject the null hypothesis and conclude that there is an association between self-efficacy and glycaemic control among diabetic patients.

Overall Self-Care Practices among Patients with Diabetes Mellitus

The study evaluated the following self-care activities; dietary control, regular physical activity, drug compliance, self- blood glucose monitoring and medical follow ups. Less than three quarters (70%) of the participants practiced good self-care. This could be attributed to the fact that two thirds (65%) of the participants followed the recommended diet. The possible reasons for following the recommended diabetic diet could be that most of the participants could afford to buy roller meal for nshima and vegetables which was most mentioned. Although, the most consumed food was nshima, brown bread and rice, patients should be offered other food alternative of low glycaemic index which is affordable such as soy products, beans and fruits. In a study conducted by Ojo et al., [23] it was noted that the low-Glycaemic Index (GI) diet (such as legumes, lentils, and oats usually contain carbohydrates which break down slowly during digestion and are slowly assimilated) is more effective in controlling glycated haemoglobin and fasting blood glucose compared to a higher-Glycaemic Index diet (foods that are composed of carbohydrates which break down quickly during the process of digestion such as white bread). It was also observed that foods with high Glycaemic Index not only rapidly increase blood glucose, but also leads to insulin resistance following the consumption of food. This results into glucose not being effectively cleared from the blood after eating which can add to more glucose in the blood. Similarly, Wang et al., [24] also observed that low carbohydrate diet can improve blood glucose more than low fat diet, it can also regulate blood lipid, reduce body mass index, and decrease insulin dose in patients with type 2 diabetes mellitus.

The current study also revealed that slightly more than three-quarter (79.4%) of the participants reported to have been regularly performing physical exercises. Physical activity is a low- cost intervention that helps prevent most non- communicable diseases [25]. Physical activity can help people with diabetes mellitus achieve a variety of goals, including increased cardiorespiratory fitness, increased vigour, improved glycaemic control, decreased insulin resistance, improved lipid profile, Blood Pressure (BP) reduction and maintenance of weight loss. Further, more than three quarters (85%) of the participants performed physical exercises 3-7 days in a week and (15%) exercised less than 3 days in a week. However, among those that regularly performed physical exercise, slightly more than half (55%) did walking as an exercise and only (37%) exercised for 30 minutes while others exercised for less than 30minutes. One possible reason could be that majority of the participants were elderly so they could not manage any other type of exercise apart from walking. The findings are consistent with a study conducted by Bailey et al., [26] on diabetes mellitus

in Zambia and the Western Cape Province of South Africa on prevalence, risk factors, diagnosis and management, the highest risk groups identified were of older age and those with obesity. This is because aging can lead to physical inactivity and immobility due to reduced bone strength, muscle tone and elasticity, while obesity could be attributed to sedentary life styles. Therefore physical exercise should be strengthened and diverse means of exercises apart from walking which can benefit the elderly should be introduced. The study also showed that approximately two thirds (66%) of the participants adhered to diabetic drugs they were taking. The study further revealed that close to three quarters (71%) of the participants had not missed any dose of the drug they were taking. These findings are supported by Gordon, et al., who observed that medication adherence was highest in the oral hypoglycaemic agents monotherapy cohort (81.6%), followed by dual-therapy (80.8%), they concluded that increasing medication adherence can bring about meaningful improvements in HbA1c control as the requirement for treatment escalation increases. On the contrary, Kassahun, et al., [17] reported a significant number of diabetic patients with low level of adherence to medications. This can be attributed to the high number of male participants in the study (61.8%). Males generally have a poor health seeking behavior. Despite the good adherence to medication, (91%) of participants stopped taking medication at one point in time. This could be attributed to erratic supply of drugs in the health facilities, lack of money to buy, bad side effects of drugs and the emergence of Covid-19 pandemic which led to restriction in the number of patients attending clinic at each visit. These results were inconsistent with a study conducted by Nyirongo, et al., [14] on adherence to treatment by patients with type 2 diabetes mellitus, the results showed that more than half (56.5%) of diabetic patients had poor adherence to treatment despite having high knowledge about the disease.

Two thirds (61.6%) of participants were able to monitor their blood glucose levels. Monitoring blood glucose is most effective when combined with an education programme that incorporates instructions for people with diabetes on healthy behaviour changes in response to blood glucose values and for health-care providers on how to adjust anti hyperglycaemic medications in response to Blood Glucose readings [15]. This suggests that Blood glucose monitoring cannot singly control blood glucose level it should be combined with self-care activities such as dietary control and medication adherence.

The results of this study showed that more than three quarters (84.8%) of the participants kept the doctors' appointments. Raman and Hansdak, [27] in their study on the effect of regular treatment, follow-up, and lifestyle practices in diabetic patients with ocular manifestations they noted that more than half (55.7%) of the participants regularly followed up medical checkups. They highlighted the importance of regular treatment and follow-up by patients with diabetes in relation to development of ocular manifestations. The study also noted that ocular manifestations among diabetes patients were higher among those who were not on regular treatment and follow-up, which included control of blood

glucose levels. Without medical follow up, drug resistance and complications cannot be identified early which can result in poor quality of life and high mortality. Similarly, Nyirongo, et al., [14] also observed that poor adherence to treatment recommendations was attributed to polygonal factors such as distance to the hospital, poor attitude towards self-care management and the health care system. Distance to the health facility can negatively affect the patient's medical follow up as patients may not have the means of reaching to the health facility in terms of transport.

The binary logistic regression analysis test which was used to analyze the combined impact of dependent (glycaemic control) and independent variables (self-efficacy and self-care practices) revealed that changes in patient's self-care practices would increase the odds of improving glycaemic control by 6.64 times. This meant that patients who practiced good self-care were more likely to have improved glycaemic control.

Conclusion

The results revealed poor glycaemia control which was mainly attributed to inconsistent supply of drugs, failure to adhere to recommended diet and inability to regularly monitor the blood glucose levels. However, there was high overall self-efficacy among the participants. There was also an association between self - efficacy and glycaemic control. There is need to strengthen the educational strategies to empower patients with accurate information that will help them address the challenges of self - management thereby improving glucose levels. Further, improved provision of medical supplies, procurement of machines that can measure HbA 1c that reflects the glucose concentration over a period of time, this will help maintain euglycaemic status. There is also need to develop simple IEC materials in various local languages in order to raise the knowledge levels.

Additionally self - efficacy should be incorporated and strengthened in the diabetic treatment protocols in form of psychological counseling.

Limitations of the Study

- i. The use of Fasting Blood Glucose (FBG) over HbA1c was a limitation to the study since a standardized method of measuring accurate glucose levels through HbA1c was not available. To ensure "near" accuracy of blood glucose levels among diabetic patients, the study only included those who had the previous two consecutive results of FBG and the current blood glucose level was measured at the clinic on the day of data collection for all participants.
- ii. Insufficient sample size (n=112) instead of 127 for statistical measure owing to the outbreak of COVID-19 pandemic which resulted in restricted hospital visits for routine medical checkups. The study was conducted on a small sample size (n=112) hence the results should be generalized with caution. The problem was confounded by the closure of the clinic for about 2 months. However, the period for data collection was extended and the researcher managed to interview 112 participants only [28].

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