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INFLUENCE OF HEALTH SEEKING BEHAVIOUR ON GLYCEMIC CONTROL AMONG TYPE 2 DIABETES MELLITUS FEMALE PATIENTS AGED 35-60 YEARS IN TAVETA SUB-COUNTY HOSPITAL

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INFLUENCE OF HEALTH SEEKING BEHAVIOUR ON GLYCEMIC CONTROL AMONG TYPE 2 DIABETES MELLITUS FEMALE PATIENTS AGED 35-60 YEARS IN TAVETA SUB-COUNTY HOSPITAL

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Abstract

Purpose: The study aimed to assess the effect of the health seeking behaviour on glycemic control among type 2 diabetes mellitus female patients aged 35-60 years in Taveta sub-County Hospital.

Methodology: A descriptive cross sectional design was adopted and systematic random sampling technique used to select 135 study subjects comprising of T2DM female patients aged 35-60 years who are registered at Taveta sub-County hospital diabetes outpatient clinic. Quantitative data was collected from informed consenting T2DM female patients using researcher administered structured questionnaire for health seeking behaviour factors, and glycemic control. The fasting blood sugar readings obtained from the patients' self blood sugar monitoring cards was used to establish glycemic control. Quantitative data was analyzed using Statistical Package for Social Scientists (SPSS) Version 22.

Findings: The odd of having a good glycemic control is 1.416 times higher for environment of the diabetes clinic room/area that is clean as compared to environment of the diabetes clinic room/area that is somewhat clean. The most used method to control glucose is the herbal remedies to manage diabetes.

Unique contribution to theory, practice and policy: The patients should attend to all scheduled clinic check-ups to get the health care personnel and nutritionists counsel the patients based on the progress assessment. The patients should moreover keep the progress communicated to the health officers when there are changes in their sugar levels. The monitoring of blood sugar should be done regularly. It is recommended for an increase in scope for creation of diabetic awareness and reach out to the patients and community.

Key terms: *Glycemic control, fasting blood sugar, hyperglycaemia*

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INTRODUCTION

Diabetes mellitus is a chronic metabolic blood glucose control condition characterized by hyperglycemia. It occurs due to failure of the pancreas to produce enough insulin or when insulin produced cannot be effectively used by the body's cells. Ninety per cent of all diabetes worldwide Present with type two diabetes mellitus which occurs when the body fails to use insulin effectively. With time, hyperglycemia causes irreversible damage to many tissues in the body, paving way to the onset and progression of life-threatening health complications (American Diabetes Association, 2015).

Global prevalence of diabetes has almost doubled from 4.7% in 1980 to 9.3% in 2019 among the adult population (IDF Atlas, 2019). In the past decade, there has been a fast increase in the occurrence of diabetes in low as well as in middle income countries (WHO, 2016). In the year 2019, approximately 463 million adults had diabetes with the likelihood that it will escalate to 700.2 million people in 26 years (IDF Diabetes Atlas, 2019).

In Africa the estimated prevalence for diabetes was 4.7% in 2019 and is predicted to grow to 5.2% by the year 2045 where 40.7 million people will have diabetes (IDF Atlas, 2019). In 2019, diabetes attributable mortality was 1.8 times higher in females and caused 234,500 deaths than in males where it caused 131,700 deaths (IDF Atlas, 2019). In Kenya, the overall prevalence of diabetes is 2.4%. Females have a higher prevalence of diabetes (2.8%) than males (2.0 percent prevalence) (Mohammed *et al.*,2018).

Glycemic control or to maintain blood glucose levels within recommended range in person with diabetes, is considered the main management goal for prevention of complications like kidney failure, amputations, stroke, blindness and heart attack, among diabetic patients (American Diabetes Association, 2016). Glycated haemoglobin (HbA1c) is used to monitor glycaemic control.HbA1c indicates a measure of the average plasma glucose in the previous 12 weeks. In the absence of HbA1c, fasting blood glucose values can be used to assess glycemic control. HbA1c concentration of less than 7% or fasting plasma glucose of <=7mmol/l and post prandial plasma glucose of <=9mmol/l indicate good glycemic control (IDF, 2020).

Glycemic control and health outcome in T2DM are directly and indirectly associated with health seeking behavior factors (Walker *et al.*,2015). A study done in Libya on glycemic control among "type two diabetics and the role of their coping behaviours in managing diabetes" revealed that being female, unmarried, having primary education, unemployed Significantly correlated with impaired glycemic regulation.

Statement of the Problem

Poor glycemic control presents a significant public health concern and has been described as a risk factor for the onset and progression of complications linked to diabetes management. These have the ability to increase health care costs and reduce both life expectancy and quality of life. Despite this evidence, a high percentage of patients with diabetes remains poorly controlled. This is evidently the case for majority of patients under management who do not reach optimal glucose target of 7.2mmol/l (Kibirige et al., 2017).

About 75% of 4.2 million deaths attributable to diabetes in adult population aged 20-79 years occurred in people aged below 60 years (IDF Atlas, 2019). A study done in Korea, revealed low probability of women to achieve glycemic control after one year of treatment for type 2 diabetes (Choe *et al.*, 2018). Further, results of a systematic review and meta-analysis to determine glycemic control done in Ethiopia by Gebreyohannes *et al*. (2019) showed that only 34% of patients in 16 studies achieved glycemic control based on fasting blood sugar.

A national survey conducted in Kenya on the "Prevalence and factors associated with pre-diabetes and diabetes mellitus in Kenya in adults of 18-69 years of age" revealed that the prevalence of diabetes and prediabetes was 3.1% and 2.4% respectively and among those previously diagnosed with Diabetes and were currently on treatment only 7% had achieved control (Mohamed *et al.*,2018). Inadequate glycemic control leads to an increase in the incidence of diabetes complications that pose a risk to public health. (Alberti *et al.*, 2007).

Due to poor glycemic control, a high number of diabetes patients are referred for further management and specialized treatment at Kenyan National Referral Hospitals and hospitals in foreign countries. (NNSP, 2015). The proposed study seeks to determine the degree of glycemic control among female patients with type 2 diabetes mellitus aged 35-60 years in Taveta sub county, Kenya. The study will fill the conceptual gap by revealing the health seeking behaviours and how they affect glycemic control among female diabetes mellitus patients. It will answer the questions on health seeking behaviour factors that influence glycemia in women; health seeking behaviours of glycemic control among type 2 diabetes mellitus female patients aged 35-60 years in Taveta sub-County Hospital.

Purpose of the study

Findings of the study are aimed at adding to the existing literature with respect to the particular effects of the health seeking factors on the glycemic control among type 2 diabetes mellitus female patients aged 35-60 years. Findings will be used to institute gender specific approaches in glycemic control among type 2 diabetes mellitus patients in the study area and elsewhere.

Research Question

What is the effect of the health seeking behaviour on glycemic control among type 2 diabetes mellitus female patients aged 35-60 years in Taveta sub-County Hospital?

Limitations of the Study

Glycemic control will be assessed using fasting blood sugar and not HbA1C which is the gold standard. Patients are not able to afford HbA1C test.

The study was limited to women T2DM out-patients

LITERATURE REVIEW

Empirical Literature

An analysis done by International Diabetes Federation (2017) revealed that the prevalence of diabetes retinopathy among people with diabetes was 35% and this was associated with

deteriorating glycemic control; it also revealed that good glycemic control evidenced by HbA1c of 7% can lead to a 35% risk reduction of amputation.

The International Diabetes Federation (2019) reported that there is a considerable percentage of people with undiagnosed diabetes, those who do not know they have diabetes. This increases the possibility of developing chronic complications paving way to increased morbidity and mortality as evidenced by figures indicated on global estimates on diabetes prevalence.

Santos *et al.* (2014) established that that diabetes causes 50,000 people in United States of America to seek treatment for kidney failure, was attributed to 44 percent of all new cases of renal failure and also caused more than 73,000 lower limb amputations, which translated into 60% of all lower limb amputations.

A cross sectional study done involving 98 diabetes mellitus patients conducted on "Awareness, Practices and Treatment Seeking Behavior of Type 2 Diabetes Mellitus Patients" in Delhi by Kishore *et al.* (2015) aimed to evaluate the patient's understanding of their illness and its symptoms, practices, behavior-seeking care and the average cost of managing it. A diagnosis was established through conducting two community surveys and interviewed by administering pretested questionnaire. Data was analyzed using SPSS software, version 17. The study results revealed that the patients did not know the usefulness of regular treatment and management, consequently most of them were not taking diabetes medication.

Atwine & Hjelm (2016) in their study on perspectives of traditional healers on healthcare-seeking behavior and T2DM management; established that healthcare seeking pattern was influenced by living conditions and lacked consistency with patients alternating among diverse healthcare providers. Results of the study also revealed that Patients with diabetes sought healthcare in the professional healthcare sector principally to address severe symptoms linked to diabetes or glycemic control. Females focused on diabetes management follow up and infections or joint pain while males described fewer problems.

Findings of a study on "care seeking dynamics among patients with diabetes mellitus and Hypertension in selected rural settings in Kenya" by Karinja *et a*l.(2019) revealed that 58% of the 1100 respondents had regular scheduled clinic visits with their healthcare provider and that having social support while on treatment and hospitalization had positive association with appropriate health seeking behaviour .In the study, it was established that differences in health protective behavior between diabetic males and females aiming to maintain glycemic control have been noted. Women have been found to be less compliant because adherence to traditional sex roles presents a hidden barrier. The woman may not be willing to modify her family's lifestyle to accommodate her health needs, feel she has limited support from her family or fail to disclose her illness to her family.

Theoretical framework

Dorothea Orem's theory

This theory of self-care deficiency nursing was established between the year 1959 and 2001. Theory emphasizes on the ability of each person to do self-care, defined as the practice of actions that individuals initialize and carry out on their own behalf in protection of life, well-being and

health. It is predominantly used in recovery and primary care, where the patient is allowed to be as independent as possible.

This theory is particularly relevant to the study because the management of type 2 diabetes is individualized and the patient is independent in managing their condition to achieve set goals.

Conceptual framework

The following is the conceptual framework.

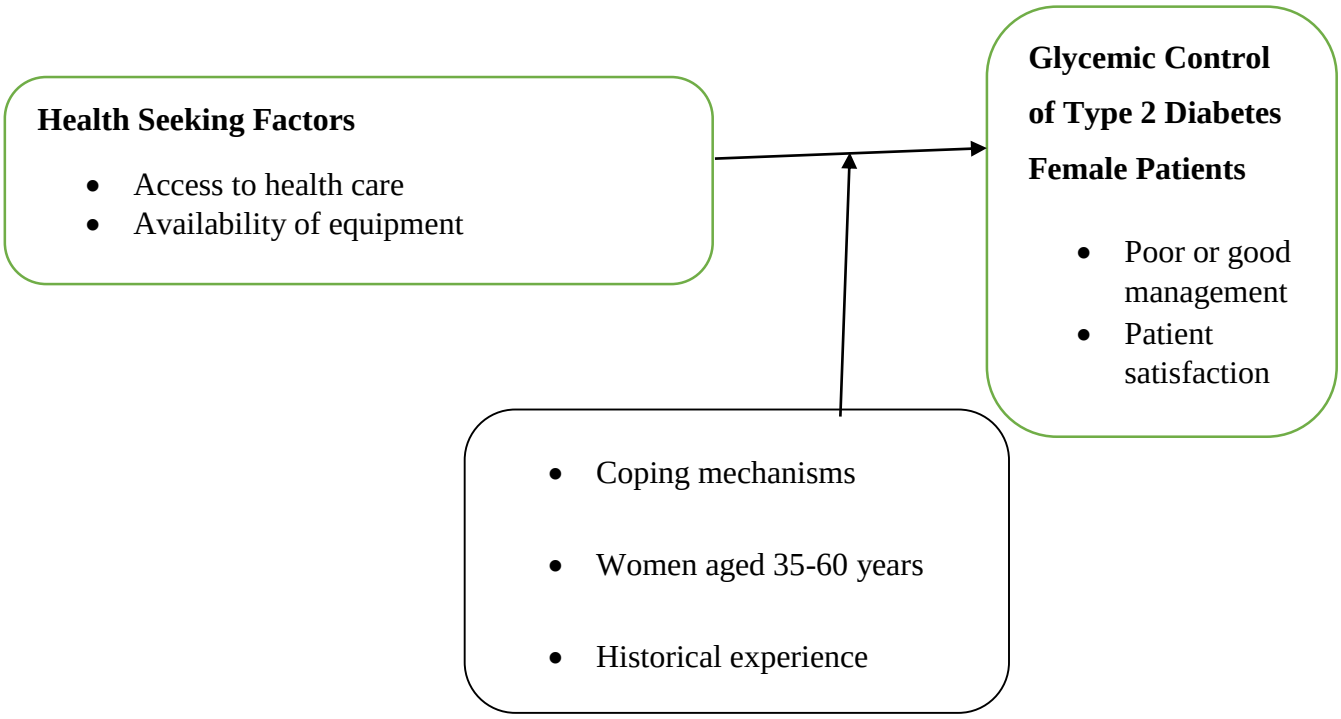

Figure 1 Conceptual Framework

Plenty of literature supports the valuable effects of socio-economic factors such as diet and physical activity therapy for improving and maintaining glycemic control among T2DM patients. Adherence to diet and physical activity therapy is considered adequate when a T2DM patient Performs at least 150 minutes of physical exercise per week.

More than 50% of T2DM patients believe that management of socio-economic factors would improve their condition, however greater proportion face difficulty to start and sustain physical activity. However, patient adherence to diet and physical activity recommendations can be enhanced by improving diabetic education, shaping perception, increasing motivation, and self-management.

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RESEARCH METHODOLOGY

Research Design

This study adopted a cross sectional descriptive design. Both quantitative and qualitative approaches of data collection were utilized to obtain pertinent and precise information and help elicit observations, opinions and attitudes concerning health seeking behavior for glycemic control among T2DM patients attending Taveta sub-County Hospital.

Inclusion criteria

Female patients aged 35-60 years living with T2DM and attending Taveta sub-County Hospital outpatient clinic for at least six months who gave informed consent to participate in the study.

Exclusion criteria

Patients who met the inclusion criteria but required emergency medical attention, or were expectant and or lactating.

Independent variable

Health seeking behavior factors

- Access to healthcare was assessed by ease or limited access to healthcare
- Availability of equipment was assessed by possession of a glucometer by the patient and number of times patient does self-monitoring of blood glucose per week.

Outcome variable/dependent variable

Glycemic control-Fasting blood glucose was used to assess glycemic control. This was determined by taking the average of the last two consecutive fasting blood glucose readings. Good glycemic control was a fasting blood glucose measurement of ≤7.0mmol/l determined by taking the average of the last two consecutive FBG readings.

Poor glycemic control was a fasting blood glucose measurement of ≥7.0mmol/l determined by taking the average of the last two consecutive FBG readings. Sustained glycemic control measure among the patients is useful in prediction compared to instantaneous glycemic control measure, which prompted the recording and averaging of patients' glycemic control levels.

Location of the study

The study site was Taveta sub–County Hospital. Taveta sub-County has a total population of 91,222 persons; 47,410 males and 43,812 females according to 2019 national census. Taveta sub-County was purposively selected because it is a marginalized area, border town with heavy commercial activities. The target population comprised of every patient who comes to the diabetic outpatient clinic at Taveta sub-County Hospital.

Sample and Sampling procedures

A sample was constituted by selecting the required number of respondents from the population, using systematic Random sampling technique. Approximately 60 patients are seen on every clinic day conducted once a week. On completing interview, the procedure was repeated on the next available clients until a sample of 15 participants were selected every day. This was repeated on

subsequent clinic days until the sample of 110 respondents was attained. This sample size was adopted from the study by Nduati *et al*. (2016) who assessed factors associated with glycemic control among type 2 diabetes patients attending Mathari National Teaching Hospital.

The study population was approximated to be 178. Female Adults aged 35-60 years of with T2DM as the primary diagnosis have managed the condition for at least six months and are attending diabetic clinic between October 2020 and November 2020 was included in the study.

The study collected both primary and secondary data. Secondary data obtained from scholarly paper reviews and client record on fasting blood sugar level. Quantitative data was collected by use of structured questionnaires. Qualitative data was obtained through one key informant interview with the in charges of diabetes clinic and one focused group discussions with the patients.

Data collection methods

The data collection process was conducted by the researcher assisted by two trained personnel. On the days of the medical appointments, standardized questionnaires were administered to all diabetes type 2 patients who gave informed consent. These questionnaires were only issued to those patients of age bracket 35 and 60 years.

Data analysis techniques

Qualitative and quantitative data was obtained. This was done using the chi-square and the odd ratios regression. The odd ratio regression and the Chi-square tests were carried out to test for association between variables. The association between exposure and an outcome is measured by Odds Ratio (OR).

Qualitative data from key informant interviews and focused group discussions were evaluated, classified based on research objectives and reported as narrations from respondents.
Quantitative data was cleaned, entered and statistically analyzed using SPSS version 20.
$P<0.05$ at 95% confidence interval was considered significant (Taylor, 2001). The research results and interpretation was presented in tables, pie charts and bar graphs to describe, organize and summarize data. The conclusions were used for discussion and recommendation.

FINDINGS, ANALYSIS AND PRESENTATION

Demographic analysis

This study is a social study and therefore needs to consider the demographic characteristics of the respondents

Table 1 Demographic analysis

		Frequency	Percent
Marital status	**Married**	**78**	**70.9**
	Divorced	**4**	**3.6**
	Separated	**14**	**12.7**
	Widowed	**11**	**10**
	Co-habiting/living in	**3**	**2.7**
Age bracket	**35-45 years**	**36**	**32.7**
	46-55 years	**43**	**39.1**
	56-60 years	**31**	**28.2**
Education level	**Primary**	**54**	**49.1**
	Secondary	**36**	**32.7**
	College	**17**	**15.5**
	University	**3**	**2.7**
Religion	**Roman catholic**	**52**	**47.3**
	Protestant/other Christian	**44**	**40**
	Muslim	**12**	**10.9**
	No religion	**2**	**1.8**

The results show that majority of the patients (70.9%) in the diabetic outpatient clinic were married, 12.7% of the patients were separated, 10% were widowed, 3.6% were divorced whereas 2.7% were Co-habiting partners.

From the results, majority of the respondents were aged between 46 – 55 years (39%), 33% were aged between 35 to 45 years, whereas 28% were aged between 56 to 60 years. Since the patients were selected randomly, the distribution of respondents was uneven in terms of age.

From the results, majority of the respondents had gone up to primary education (49%), 33% had gone up to secondary education, 16% had gone up to college education, whereas 2.7% had gone up to university education.

The results show that majority of the patients (47%) in the diabetic outpatient clinic were Roman Catholic, 40% of the patients were Protestants, 10.9% were Muslims whereas 1.8% were not in religion.

Health seeking behavior

The study evaluated the health seeking behavior factors influencing glycemic control among type 2 diabetes mellitus female patients. The analysis was based on the objective of health seeking behavior factors. The illustrations on dietary practices are as shown in Table 2.

Table 2 Clinic checkups attendance

	Never	Rarely	Often
How often do you go for unscheduled checkups	7.3%	51.8%	40.9%
How often do you go for scheduled clinic checkups	1.8%	8.2%	90.0%

Majority (51.8%) noted that they rarely go for unscheduled checkups, 40.9% noted that often times they go for unscheduled checkups while 7.3% noted that they never go for unscheduled checkups. Most respondents (90%) noted that they often go for scheduled clinic checkups, 8% indicated that rarely go for scheduled clinic checkups while 2% noted that they never go for scheduled clinic checkups. Scheduled clinic checkups enhance the management of glycemic levels, with the consistent and relevant advice from health practitioners. A cross sectional study done involving 98 diabetes mellitus patients conducted on “Awareness, Practices and Treatment Seeking Behavior of Type 2 Diabetes Mellitus Patients” in Delhi by Kishore *et al.* (2015) revealed that the patients did not know the usefulness of regular treatment and management, consequently most of them were not taking diabetes medication.

The study assessed treatment that Health care workers give the diabetes patients. Illustrations are as per Table 3.

Table 3 Health care workers behavior

	Frequency	Percent
Never	1	0.9
Sometimes	19	17.3
Often	90	81.8

Majority (81.8%) noted that often health care workers treat them with courtesy and respect when they visit a clinic, 17.3% noted that sometimes health care workers treat them with courtesy while 0.9% noted that health care workers never treat them with courtesy.

On assessing the environment of the diabetes clinic room, findings are as shown in Table 4.

Table 4 Clinic room environment

	Frequency	Percent
Somewhat Clean	24	21.8
Clean	86	78.2

Majority (78.2%) noted that the environment of the diabetes clinic room/area is clean, while 21.8% noted that the environment of the diabetes clinic room/area is somewhat clean. The findings on the cleanliness of clinic rooms is due to the choice of the respondents to attend clinics where the health conditions and the quality of services is high.

The study assessed the frequency of monitoring the blood sugar. Illustrations are as per Table 5.

Table 5 Monitoring the blood sugar

	Frequency	Percent
Daily	38	34.5
At a visit to health care facility	45	40.9
Weekly	27	24.5

Majority (40.9%) noted that they monitor the blood sugar at a visit to health care facility, 34.5% noted that they monitor the blood sugar daily while 24.5% noted that they monitor the blood sugar weekly.

On assessing the nearness of the clinics attended, findings are as shown in Table 6.

Table 6 Nearness of clinic

	Frequency	Percent
Near	53	48.2
Far	39	35.5
Very far	18	16.4

Majority (48.2%) noted that the health care facility they attend is near, 35.5% noted that the health care facility they attend is far while 16.4% noted that the health care facility they attend is very far.

The respondents in the key interview noted that some women are involved with alcohol drinking and cigarette smoking leading to poor glycemic effects. Further it was noted that the love for junk foods and poor feeding lifestyles influenced by social media adversely affect glycemic levels. The respondent further noted that poor weight control is linked to poor feeding habits which affect the glycemic levels of patients. The respondents of the interviews noted that non-adherence to appointments and lack of equipment and materials for blood sugar monitoring are the main challenges faced by diabetic patients. It was noted that some patient seek health services when condition of diabetes is out of control.

The study assessed the influence of Health seeking factors on glycemic control among type 2 diabetes mellitus female patients. Findings are as presented in Table 7.

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Table 7 Bivariate Regression Results of Health seeking factors on glycemic control

Health seeking factors		Glycemic control						Regression Results			
		Poor	%	Good	%	N	Chi sig	Sig.	OR	95% CI	
										Lower	Upper
HS1_unscheduled_checkups	Never	0	0.0	8	100.0	8	6.107 (0.047)	0.192	REF	REF	REF
	Rarely	10	17.5	47	82.5	57		0.999	0	0	.
	Often	15	33.3	30	66.7	45		0.999	0	0	.
HS2_scheduled_clinics	Never	1	50.0	1	50.0	2	16.107 (0.001)	0.010	REF	REF	REF
	Rarely	0	0.0	9	100.0	9		0.009	10.62	6.233	15.23
	Often	24	24.2	75	75.8	99		0.007	13.125	10.188	51.888
HS3_respect_treatment	Never	1	100.0	0	0.0	1	6.107 (0.047)	0.147	REF	REF	REF
	Sometimes	0	0.0	19	100.0	19		0.999	2.61E+18	0	.
	Always	24	26.7	66	73.3	90		1	4.44E+09	0	.
HS4_clinic_environment	Somewhat Clean	3	12.5	21	87.5	24	21.828 (0.006)	0.047	1.416	0.113	1.53
	Clean	22	25.6	64	74.4	86					
HS5_sugar_monitoring	Daily	18	47.4	20	52.6	38	20.204 (0.000)	0.000	REF	REF	REF
	At a visit to health care facility	5	11.1	40	88.9	45		0.001	0.2	0.0333	2.219
	Weekly	2	7.4	25	92.6	27		0.003	0.25	0.0329	4.333

HS6_nearest_clinic	Near	15	28.3	38	71.7	53	6.107 (0.047)	0.316	REF	REF	REF
	far	8	20.5	31	79.5	39		0.396	1.53	0.574	4.077
	very far	2	11.1	16	88.9	18		0.156	3.158	0.646	15.436

At a significance level of 0.05 to ordinal scale and a bivariate logistic Data was transformed and conducted to determine the influence of Health seeking factors on glycemic control among type 2 diabetes mellitus female patients aged 35-60 years, and thus screen the Health seeking factors for inclusion in multivariable logistic regression. The result revealed that the odd of having a good glycemic control is 10.62 times higher for women who rarely go for scheduled clinic checkups as compared to women who never go for scheduled clinic checkups (Odds= 10.62, p=0.009). The odd of having a good glycemic control is 13.125 times higher for women who often go for scheduled clinic checkups as compared to women who never go for scheduled clinic checkups (Odds= 13.125,p=0.007). Scheduled clinic checkups enhance the management of glycemic levels, with the consistent and relevant advice from health practitioners. A similar research aimed at identifying glycaemia regulation determinants among people with T2DM was done in Bangladesh by Afroz *et al*. (2019) and results showed poor glycemic control was associated with low level of education, infrequent follow up check-ups, and insulin use.

The odd of having a good glycemic control is 1.416 times higher for patients who feel the environment of the diabetes clinic room/area that is clean as compared to patients who feel the environment of the diabetes clinic room/area that is somewhat clean (Odds=1.416,p=0.047). The odd of having a good glycemic control is 0.2 times higher for women who monitor their blood sugar at a visit to health care facility as compared to women who monitor their blood sugar daily (Odds= 0.2,p=0.001). Further, the odd of having a good glycemic control is 0.25 times higher for women who monitor their blood sugar weekly as compared to women who monitor their blood sugar daily (Odds= 0.25,p=0.003). The hygiene levels and regular monitoring of blood sugar among the patients are factors that maintain the blood sugar levels at good state. Results from a study conducted in Ethiopia by Mamo *et al*. (2019) seeking to identify the determinants of poor glycemic revealed that, failure to do blood glucose level self-monitoring, engaging in physical exercise for three days or less per week and total cholesterol of 200 mg/dl or more were the independent determinants of poor glycemic control.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The result revealed that the odd of having a good glycemic control is 13.125 times higher for women who often go for scheduled clinic checkups as compared to women who never go for scheduled clinic checkups. The scheduled clinic checkups are necessary for the health care

personnel and nutritionists to counsel the patients based on the progress assessment. The odd of having a good glycemic control is 1.416 times higher for environment of the diabetes clinic room/area that is clean as compared to environment of the diabetes clinic room/area that is somewhat clean. The level of cleanliness and order in the clinic are assurances of better services and thus patients follow the guidelines outlined by the health officers on their diabetes treatment standard. The odd of having a good glycemic control is 0.2 times higher for women who monitor their blood sugar at a visit to health care facility as compared to women who monitor their blood sugar daily. Daily monitoring of blood sugar is advised, since the patients gets the current condition of the blood sugar and thus correct precautionary measures are advised based on the condition of the patient.

Recommendations

The study recommends that the medication follow-up and dietary practices for the diabetic patients should be a community affair, both relatives and friends, to ensure that the diabetic patients have followed the prescribed lifestyle and precautionary health measures.

The patients should be trained by health professionals to attend all scheduled clinic checkups to get the health care personnel and nutritionists counsel the patients based on the progress assessment. The patients should moreover keep the progress communicated to the health officers when there are changes in their sugar levels. The monitoring of blood sugar should be done regularly. It is recommended for an increase in scope for creation of diabetic awareness and reach out to the patients and community. The creation of support system by the government involving family and members of the community affected is necessary.

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