Factors Influencing Occurrence of Diabetes Mellitus in Shieywe Location Kakamega County: A Cross-Sectional Study

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Abstract: This cross-sectional study sought to establish factors influencing occurrence of diabetes mellitus in Shieywe location Kakamega County.

Methods: Data was collected through face-to-face interview with selected respondents by a structured questionnaire. Results: 327 respondents took part in the survey, of which 135 (41.3%) were females and 192 (58.7%) were males. Only 23 (7.6%) of the respondents had attained tertiary education (post-secondary education). 91(29.9%) of the respondents had attained secondary education. Most of the respondents, 190 (62.5%) had acquired primary education. Although bicycling exercise is attributed to be a means of preventing diabetes mellitus but those who did were 13 (4.3%) as those who did not were 291 (95.7%). The non-diabetics seeking diabetes medical assistance who covered less than a kilometer to reach a health facility were 73 (24%), as those who covered between 2-5 kilometers being 161 (53%) and those who covered more than 6 kilometers were 70 (23%) to attend scheduled clinics and medical attention. Conclusion: most of diabetics covered more than 6 Kms and 2-5kms to reach a health facility. The Ministry of Health should provide comprehensive services for diabetes mellitus management at level two health facilities to make diabetes mellitus services accessible and affordable.

Keywords: Diabetes mellitus, socio-demographic, management, community.

1. BACKGROUND

More than 180 million people worldwide were diabetic of which 2.9 million people died from diabetes (1). Approximately, 7.1 million Africans were said to be suffering from diabetes mellitus that by the end of 2000, a figure that is projected to rise to 18.6 million by 2030.[2]

The change of lifestyle has resulted in diabetes mellitus cases in urban areas in Kenya [3] that accounts for between 6-12% of all health-care expenditure. [4] 20% of women and the 2003 Kenya Demographic and Health Survey indicated that 7% of men and 20% of women in the Kenya are overweight or obese thus being at risk of diabetes mellitus.

Diabetes mellitus is a disease in which the body is unable to properly use and store glycogen. Glucose backs up in the bloodstream causing one's blood glucose to rise too high [5]. Thus, causing frequent urination, excessive thirst, hunger - cells are starved for energy, unexplained weight loss, fatigue delayed wound healing, slurred speech, amputations. Severe diabetes mellitus complications lead to death.

Due to lack of comprehensive health education on diabetes mellitus, about 50% of diabetes mellitus cases remain undiagnosed, Guariguata, [6] this is incriminated to lead to damage and failure of kidney, heart and liver in the body [7].

Urbanization is another factor that contributes to increased cases of diabetes mellitus. Use of motorised transport and sedentary lifestyles are some of the cardinal risk factors for diabetes mellitus [8]. People have abandoned the healthier

traditional lifestyles of walking to work place. People have shied from traditional healthy foods rich in fibers, vegetables and fruits to more refined foods rich in carbohydrates, fats and sugars.

Distance to reach a health facility is a hindrance to honour scheduled diabetes mellitus clinics at health facilities. Comprehensive health education on management of diabetes mellitus was still missing at the household level [2].

2. METHODS

This was a descriptive cross-sectional study that involved 327 people drawn from Shieywe location, Kakamega County. Through simple random sampling Shieywe location was selected from the two urban locations in the urban area of the county. The study area had a higher burden of diabetes mellitus as reported in the health management and information systems reports by the Ministry of Health. The site is an urban area with all the characteristics required for this study that is motorized transport to and fro town and availability of 'western lifestyle' foods due to proximity to town with many retail shops and supermarkets. 384 respondents were considered adequate after calculation from the total population of 28,445 people in the study location. For non-diabetics at the community level only one respondent was interviewed for every household visited and diabetics found at the health facility were interviewed.

The questionnaires were peer reviewed by 2 colleagues including a biostatistician for validation of the questions. The questionnaire was then piloted on 4 respondents at Sabatia health centre in Vihiga County. This was done in order to assess the suitability of the contents and flow of the questionnaire which was later refined for final use. All questionnaires were in the English language, which is the official language.

Both first parts of the two questionnaires covered the respondent's socio-demographic information which included: sex of respondent, age, level of education, occupation and main source of income.

For the questionnaires for non-diabetics part two covered knowledge on diabetes mellitus with questions on what is diabetes mellitus, cause of diabetes mellitus, foods attributed to cause diabetes mellitus and harmful activities that cause diabetes mellitus and where do people with diabetes mellitus seek medical assistance.

Part three covered effects of diabetes mellitus which included questions on the signs and symptoms of diabetes mellitus, site effects of diabetes mellitus.

Part four covered management of diabetes mellitus with questions on what foods eaten for breakfast and in the day, exercise for prevention or control of diabetes mellitus and mode of transport, distance covered to the nearest health facility and type of medical attention given at the facility.

The questionnaire for diabetics had questions on Sex of respondent, what is your age? What is your highest level of education? What are the long-term effects of diabetes mellitus? Which foods do you take in the day? During the past week did you do bicycling exercises, what is the distance to the nearest health facility and habits like smoking and taking alcohol?

The questionnaire for the diabetics was administered by interviewers with medical knowledge of diabetes mellitus and included community health extension workers. The questionnaires for the non-diabetics (the community) were administered through community health volunteers.

Prior to fieldwork the interviewers were taken through one day training on the data collection tools that included dry runs of the tools. The interviewers then embarked on data collection by moving from house to house within their allocated areas. The first person to be encountered in the household meeting the age criteria was interviewed. For those who declined, a second person was interviewed and in their absence the next household was visited.

All filled questionnaires were then submitted to the supervisors who checked their completeness before the interviewer left that area. In case the information was missing the interviewer revisited the respondent for further information unless they had initially declined to disclose. After entering the data analysis was done by descriptive statistics using SPSS software.

3. RESULTS

Do socio-demographic characteristics predict diabetes mellitus?

The study targeted 384 people of which 327 people were interviewed. 327 respondents took part in the survey, of which 135 (41.3%) were females and 192 (58.7%) were males (table 1). Only 23 (7.6%) of the respondents had attained tertiary education (post-secondary education). 91(29.9%) of the respondents had attained secondary education. Most of the respondents, 190 (62.5%) had acquired primary education (table 2).

Does being knowledgeable predict diabetes mellitus?

Majority of the respondents 135 (44.4%) perceived diabetes mellitus to be a disease of the affluent. A good proportion of the respondents 104 (34.2%) attributed diabetes mellitus to being a disease of the poor. The respondents who indicated that diabetes mellitus was when one had lots of sugar in the body were 56 (18.4%) as those who did not know being 9 (3%).

Majority 152 (50%) of the respondents attributed diabetes mellitus to lifting heavy loads (manual jobs). There were those who attributed diabetes mellitus to walking 60 (19.7%), bicycling 47 (15.5%), riding motor cycle 32 (10.5%) and those who did not link to any activity were 13 (4.3%).

Do the effects of diabetes mellitus predict its management?

Stretching exercise at 14 (4.6%) was done as those who did not do stretching exercise being 290 (95.4%). Those who did walking exercise were 23 (7.6%) as the majority who did not walk for exercise being 281 (92.4%).

Bicycling was done as an exercise but those who did were 13 (4.3%) as those who did not were 291 (95.7%). Bicycling as a means of preventing diabetes mellitus was done as an exercise but those who did were 13 (4.3%) as those who did not were 291 (95.7%) (Table 3)

The non-diabetics seeking diabetes mellitus medical assistance who covered less than a kilometer to reach a health facility were 73 (24%), as those who covered between 2-5 kilometers being 161 (53%) and those who covered more than 6 kilometers were 70 (23%).

4. DISCUSSION

The main aim of the study was to determine the factors influencing diabetes mellitus. The study took place on people who are not having diabetes mellitus (from the community) and those who are exposed to diabetes mellitus and seeking medical assistance from conventional health facilities. The study sought to find out the gender distribution of both non-diabetics (people from the community) and diabetics who sought health services from Elwesero model health center. More males 186 (61%) than females 118 (39%) took part in the study. This was attributed to the fact that men are in most cases the head of households so during this study the head of the household was to be interviewed but in case of absence then another person left with that responsibility was interviewed. An analysis on gender of diabetics indicated that more females 17 (73.9%) than males 6 (26.1%) sought medical assistance from the health centre. In some instances, during this study women had to seek permission to divulge health information of the household and this concurs with a study that women in most developing countries have a low social, health and economic status thus their participation in health issues is constrained. [9]

The level of education of the non-diabetics was used to determine the level of their understanding and assess how a socio-demographic characteristic predicts existence of diabetes mellitus in Kenya. Only 23 (7.6%) of the respondents had attained tertiary education (post-secondary education) and 91 (29.9%) secondary education. Most of the respondents, 190 (62.5%) had acquired primary education. Diabetics with formal education were likely to seek medical assistance from health facilities with confidence. There was a contrast of level of education in this community as a study [10] indicates that comprehensive health education is important in the management of diabetes mellitus.

The respondents were asked about their main occupation as a means financial sustainability in order to determine if there were any disparities in occupation among the respondents. A majority of the respondents practised farming, 159 (52.3%), those who did business were 99 (32.6%), and those employed were 37 (12.2%). Those who engaged in other paying

activities were 9 (3%). A Majority of the respondents did farming which, could be attributed to the fact that they produced foods to supplements the household income expenditure on foods and also since they owned or had leased pieces of land in the surrounding of Shieywe location where they live. The foods so produced in the farms could be another source of indigenous foods that are recommended for diabetics. Indicates that diabetes mellitus mostly affects the most productive segment of any society and most of these cases remain undiagnosed.[6]

The study sought to find out what the respondents perceived diabetes mellitus to be? Majority of the respondents 135 (44.4%) perceived diabetes mellitus to be a disease of the affluent. A good proportion of the respondents 104 (34.2%) attributed diabetes mellitus to being a disease of the poor. The respondents who indicated that diabetes was when one had lots of sugar in the body were 56 (18.4) as those who did not know being 9 (3%). Most of the respondents attributed diabetes mellitus to the rich people in the community as they are people who can buy sugar for tea and thus contract diabetes mellitus in due course. The description of diabetes mellitus reflects how well the community can prevent such conditions.[11]

The study sought to find out the activities which the community in Shieywe location thought was the cause of diabetes mellitus. Majority 152 (50%) of the respondents attributed diabetes to carrying heavy loads. This was linked to people who do manual jobs. There were those who attributed diabetes mellitus to people who walk for long distances 60 (19.7%), bicycling 47 (15.5%), riding motor cycle 32 (10.5%) and those who did not link to any activity were 13 (4.3%). This annulled the equal distribution of harmful activities that cause diabetes mellitus. According to (12) study during gestation period, women are at a risk of developing GDM leading to hyperglycemia and adverse pregnancy outcomes.

The study sought to find out whether the respondents take breakfast when they wake up. This is an important of dieting in prevention of diabetes mellitus. The respondents who took breakfast were majority 261 (85.9%) as those who said did not take breakfast were few 43 (14.1%). Skipping breakfast impacted negatively of the metabolic processes in the body. [13] In this study majority of the respondents took breakfast which was a good indication in maintaining sound health.

The study showed that stretching exercise 14 (4.6%) was done as those who did not do stretching exercise being 290 (95.4%). It was reported that those who did walking exercise were 23 (7.6%) as the majority who did not walk for exercise being 281 (92.4%). The study sought to identify if bicycling was done as an exercise but those who said yes were 13 (95.7%). Most of people in this location were not doing exercises for diabetes mellitus therefore this was risk factor for diabetes mellitus. This finding concurs with a study [14] that obesity is a major risk factor for Cardio-Vascular Diseases (CVD) and this risk is said to be accentuated when obesity has a predominantly abdominal component. When people do not exercise through walking, stretching and weight lifting they are at a higher risk of concentrating lots of fats in the muscles.

The study sought to establish the distance covered to reach the nearest health facility. The non-diabetics (community) who covered less than a kilometre were 73 (24%), as those who covered between 2-5 kilometres being 161 (53%) and those who covered more than 6 kilometres were 70 (23%). A study indicates that management of diabetes mellitus in higher risk group is often further complicated by additional barriers like distance to health facilities. The diabetics who covered less than two kilometres to reach a health facility were 2 (8.7%), those who covered between 2-5 kilometres were 13 (56.5%) as those who covered more than 6 kilometres were 8 (34.8%). Distance covered to reach a health facility is important to people who need prompt follow-ups and drug adherence like diabetics. [15]

5.   STUDY LIMITATIONS

The questionnaires were in English and their administration relied on the translation of interviewers for the respondents to understand and answer as truthfully as possible. The responses depended on the truthfulness of the respondents which was assumed to be reliable. The interviewers were trained in order to reduce misinterpretations of the responses.

6.   CONCLUSION

Most of the respondents had reached primary level of education therefore key messages on diabetes mellitus was difficult to share at the household level. Distance to health facilities was one of the factors influencing diabetes mellitus in the diabetics as they could not attend scheduled diabetic clinics. Diabetes mellitus health education is an important aspect on factors influencing diabetes mellitus as we focus on comprehensive diabetes mellitus prevention, control and management. Information on factors influencing diabetes mellitus is needed for individuals and communities to take

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action to control the disease. However, research to assess knowledge deficiencies on health-seeking behaviour on diabetes mellitus is lacking in developing countries.

Competing interests:

The authors declare no conflict of interest.

Authors' contribution:

WMC participated in proposal preparation, obtaining the ethical approval, study design, data analysis and in drafting the manuscript. AM participated supervision, supervision of data collection, literature review and final thesis review. CM participated in the review of the proposal and supervision of correction of thesis preparation.

Tables and figures:

Table 1: Gender distribution among diabetics and non-diabetics

Table 2: Level of education

Table 3: Exercise for diabetes mellitus

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APPENDIX - A

Table 1: Gender distribution among diabetics and non-diabetics

Gender	Males (%)	Females (%)
Non diabetics	186 (61.2)	118 (38.8)
Diabetics	6 (26.1)	17 (73.9)

Table 2: Level of education

Level of education	Frequency	%
Primary education	190	62.5
Secondary education	91	29.9
Tertiary education	23	7.6
Total	304	100.0

Table 3: Exercise for diabetes mellitus

Exercise	Yes (%)	No. (%)
Stretching	14 (4.6)	290 (95.4)
Walking	23 (7.6)	281 (92.4)
Bicycling	13 (4.3)	291 (95.7)