Social Demographic Factors and Management of Diabetes Mellitus Type 11: An Empirical Investigation from Garissa County, Kenya

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Abstract:
Studies in East Africa, West Africa, and South Africa by Miller (2013) as well as Joshi& Aravind (2017) have reported a higher rate of DM2 in the urban dwellers with an increasing trend in prevalence rates. However, no particular study has conclusively examined health education intervention and behavioural change in the control and management of DM2 in Kenya. This particular study therefore aimed to fill this existing research gap. Therefore, this study determined the effect of social demographic factors on managements of DM2 at Garissa County Hospital. The study sample size 138 adults enrolled at the diabetes clinics at the Garissa County hospital. Structured questionnaires were used for data collection. Data analysis was conducted using IBM-SPSS version 21. The results of this study provided vital information for formulating strategies and policies for comprehensive and sustainable diabetes management by County and Ministry of health.

Keywords*: Diabetes Mellitus Type 11, diabetes knowledge, diabetes management, Garissa County, Kenya*

1. Introduction

Diabetes is a disease occurring when a patient's blood glucose or blood sugar rises to very high levels. Blood glucose is the main source of energy from the food consumed. Insulin, a hormone made by the pancreas, breaks down glucose from food to get into the cells to generate energy (Gregg, et al., 2012).Diabetes is a disease that impairs the body's ability to respond to or produce the hormone insulin resulting to abnormal carbohydrates metabolism hence high levels of glucose in the blood. Diabetes mellitus type II (DM2) presents with metabolic anomalies: chronic hyperglycaemia, resulting either from the defective secretion or action of insulin (insulin resistance), or both of them combined (WHO/IDF, 2008).

DM2 currently affects more than 250 million people worldwide (WHO, 2008). Diabetes was once considered a rare disease in sub-Saharan Africa, however recent statistics from the International Diabetes Federation (IDF) in 2010, estimated over 12 million people in sub-Saharan Africa as having diabetes, and over 330,000 people would die from diabetes-related conditions (IDF, 2015). Diabetes prevalence in 2008 was also highest in south Asia, Latin America and the Caribbean, and central Asia, North Africa, and the Middle East (Danaei, et al., 2011). The age-adjusted prevalence of DM2 in Sub-Saharan Africa was 5% in 2011 and was projected to increase to 5.9% by the year 2030 (Whiting, et al., 2011). The number of people with diabetes increased from 153 million in 1980, to 347 million in 2008 (Danaei, et al., 2011). Diabetes prevalence is likely to rise in the future if diabetes incidence is not curtailed (Gregg, et al., 2012).

The DM2 burden is increasing in Garissa County and there is no documentation on prevalence, health education intervention on DM2, and utilization of non-pharmacological intervention for the disease (MoH, 2014). The increasing DM2 problem is ascribed to deep-rooted lifestyle of physical inactivity and a diet rich in cholesterol from animal products (Chege, 2010). In addition, there are few health facilities with diagnostic capabilities leading to delayed diagnosis of the disease (MoH, 2014). The diabetic patients in the county are usually referred to Garissa county hospital for diagnosis and care and primarily receive pharmacological care. However, up to 35% default on the treatment increasing the risk of developing disease burden and death. There is need to assess the effect of health education on clinical outcomes, disease and plasma concentration of the biochemical markers in Garissa County as a way of reducing incidence, and burden and cost of management of DM2.

2. Literature Review

DM2 can develop at any age, although it is more common in middle-aged and older adults (Barhum, 2017). Studies conducted in Tanzania, Cameroon, Sierra Leone, Gambia, and Kenya, related the prevalence of DM2 to age distribution of patients (Miller, 2013). In a study conducted in Tanzania, participants with diabetes were statistically older than those without diabetes (Miller, 2013). Individuals aged 45–64 years are mostly affected by DM2 irrespective of being expected to drive most economic activities in the developing country (Maina, et al., 2010).

People aged 45-59 years are 8.5 times more likely to develop diabetes than those aged 15-29 years; and those above the age of 60 are 12.5 times more likely to develop diabetes based on the present prevalence rates in sub-Saharan Africa (Ruchugo, 2015). 8.8% of adults aged 20-79, are estimated to have diabetes. 79.0% of diabetes related deaths in Africa occur in people under the age of 60 (IDF, 2015). The age of onset of DM2 in Kenya is roughly between 45 and 55, compared with 64 years in most developed countries (Maina, et al., 2010). Kinship was reported as a DM2 risk factor among rural patients in Kenya (Chege, 2010).

There are about 251.2 million men with diabetes globally and 199.5 women with diabetes thus there are 15.6 million more men than women with diabetes This difference is expected to decrease to about 15.1 million more men than women by 2040 (IDF, 2015). In a study conducted in Tanzania, proportion of participants with DM2 was higher in males than females (Miller, 2013). Study among underprivileged society in New Delhi established that the diabetes prevalence was higher in females than males (Misra, et al., 2001). The magnitude of DM2 was higher in males than in females in Ethiopia (Helamo, et al., 2017).

3. Materials and Methods

This study utilized quasi-experimental design combining qualitative and quantitative techniques of data analysis. The methodology was suitable because the purpose of the investigator was to check the degree of relationship between and between variables at a specific time point (Best & Kahn, 2006).

This study was conducted in the Garissa Central Sub-County Hospital. One of the three counties in the north-eastern region of Kenya, Garissa County is located in Garissa County, Kenya (Kenya National Bureau of Statistics, 2016). The target population was urban and peri-urban residents in Garissa County. The eligibility criteria for this study included patients diagnosed with type DM2; Patients living in the study county for the last 5 years; Patients aged 18 years and above, who are not suffering from NCD like hypertension or other serious diseases (heart, stroke, kidney or mental disease); Patients who had not developed complications; and Patients who were not using insulin; and who consent and are willing to participate.

This study excluded patients not diagnosed with type DM2; or diagnosed with DM2, however not living in the study counties, aged below 18 years, Those suffering from NCD or other serious diseases (heart, stroke, kidney or mental disease); who have complications and those using insulin; and who fail to consent and are not willing to participate. This study used purposive sampling to select Garissa Central Sub-County hospital due to its location and existing urban and peri-urban population. DM2 patients in the hospital who fit the inclusion and exclusion criteria formed the sampling frame. DM2 patients were voluntarily recruited into the treatment and control arms. The study was conducted in Garisa Level 5 hospital along with other two hospitals. The study sample size was 138 DM2 patients, that is 69 patients in the treatment arm and 69 patients the control arm.

The sample was determined by the formula for comparing two proportions (Carayannis et al, 2011) for non-inferiority clinical trials using Sakpalformula (Sakpal, 2010). The research instrument used in the study was a structured questionnaire. The questionnaire consisted of structured questions to collect data on Diabetes Knowledge (Menino, et al., 2017).

4. Results and Discussion

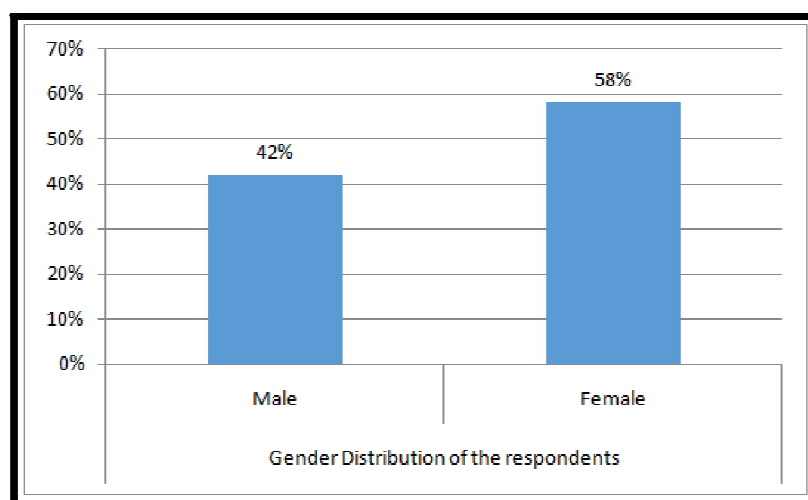*4.1. Socio-Demographic Characteristics of the Respondents*

Figure 1: Sex Distribution of the Respondents
Source: Survey Data (2019)

Figure 1 Presents Data on the Sex Distribution of the Respondents, Based On the Data, 58% Of The Respondents Were Female While 42% Were Male.
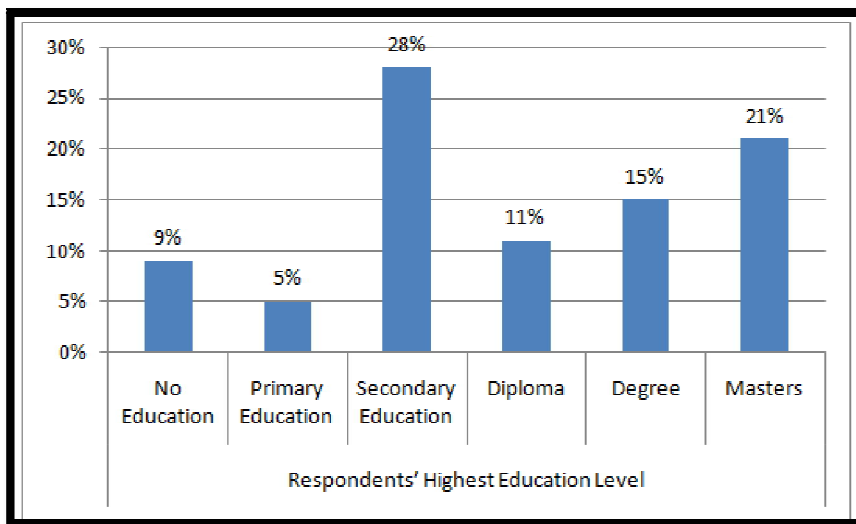
Figure 2: Highest Levels of Education Attained By the Respondents
Source: Survey Data (2019)

Figure 2 presents data on the highest education levels attained by the respondents, based on the data, 39% of the respondents indicated they had no education, 31% had primary education, 17% had Diplomas, while 3% and 2% had secondary education and Masters degree respectively. None of the respondents had PhD qualifications. The findings imply that a greater proportion of the respondents had the satisfactory level of education necessary for understanding diabetes.
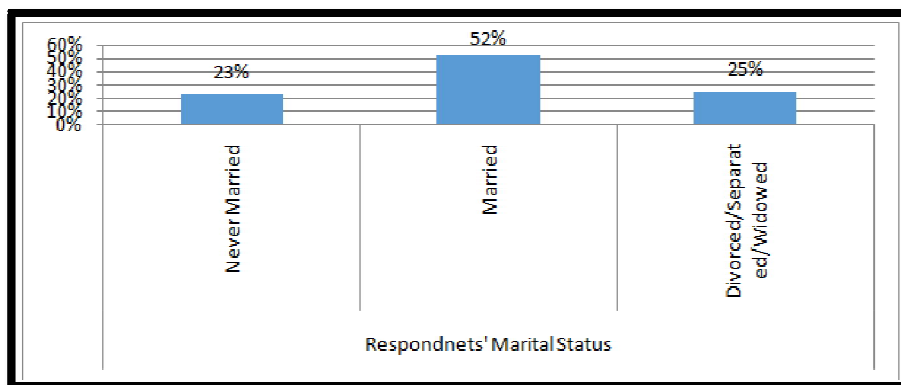

Figure 3: Respondents' Marital Status
Source: Survey Data (2019)

The data presented on figure 3 presents data on the respondents' marital status, based on the data, 52% of the respondents were married, 25% were divorced/separated/widowed, while 23% had never married.
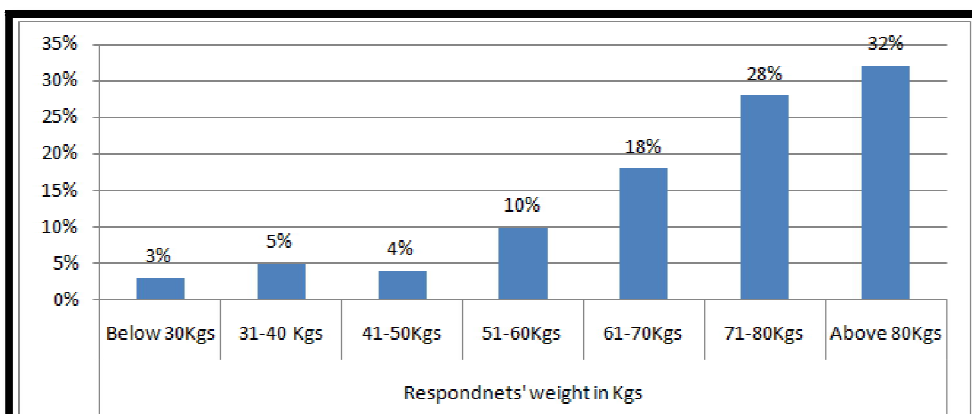

Figure 4: Respondents' Weight in Kilograms (Kgs)
Source: Survey Data (2019)

The study sought to establish the weight of the respondents, based on the data presented on figure 4.4, 32% weighed above 32Kgs, 28% weighed between 71-80Kgs, 18% weighed between 61-70 Kgs while 10% weighed between 51-60 Kgs.
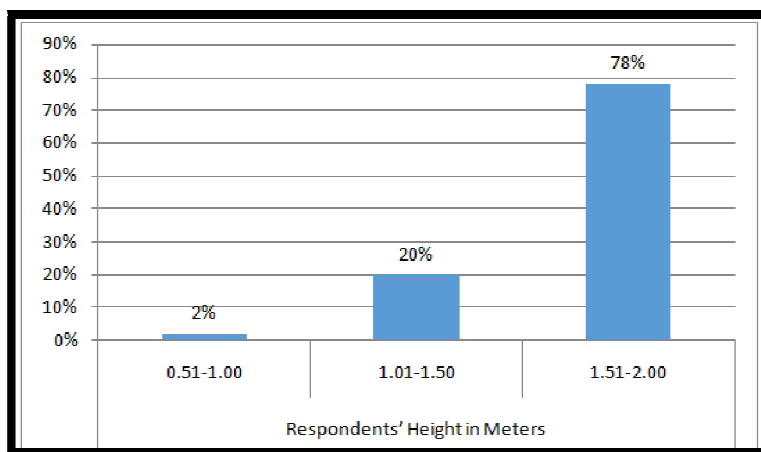
Figure 5: Respondents' Height in Meters
Source: Survey Data (2019)

The researcher recorded the heights of the respondents, this was used in the calculation of BMI, based on the data 78% of the participants recorded a height of 1.511-2.00 meters, 20% recorded heights of 1.01-1.50 meters while only 2% recorded heights ranging between 0.51-1.00 meters.
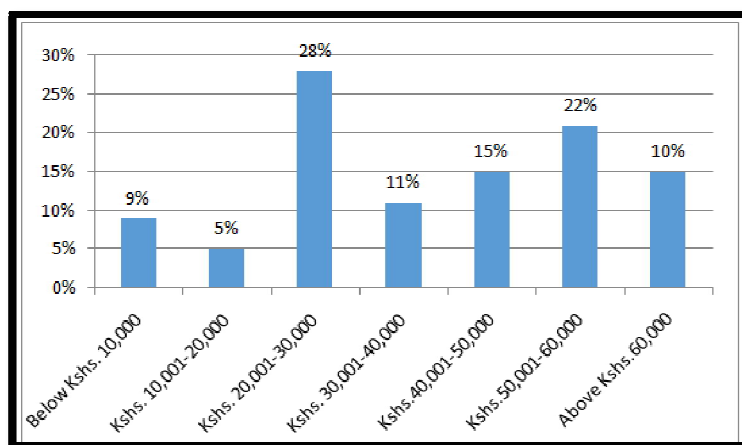

Figure 6: Respondents' Household Income
Source: Survey Data (2019)

The study sought to establish the household income of the respondents, based on the data presented on figure 4.6, 28% reported a monthly household income of Kshs.20,001-30,000, 22% reported a household income of Kshs.50,001-60,000,10% indicated an household income of 40,001-50,000 while 11% indicated an household income of Kshs.30,001-40,000 also 9% of the respondents reported a household income of below 10,000 and 5% of the respondents reported a household income of 10,001-20,000. Only 15% of the respondents reported a monthly household income above Kshs. 60,000.

Family	Frequency	Percentage
Parent	8	10
Brother/Sister	30	36
Grandfather/Mother	3	4
None	42	54
Total	83	100

Table 1: Closest Family Member with DM2
Source: Survey Data (2019)

Based on the data presented on Table 1, 54% of the respondents reported none of their closest family members had diabetes mellitus 2, 36% reported that brother/sister had diabetes mellitus 2, 10% indicated that parent had diabetes mellitus 2 while only 4% reported that grandfather/mother had diabetes mellitus 2. The findings imply that disease was not as a result of hereditary factors among a greater proportion of the respondents but as a result of their lifestyle. This further shows that there was low level of knowledge and information on diabetes risks factors as well as management among the respondents targeted for the study
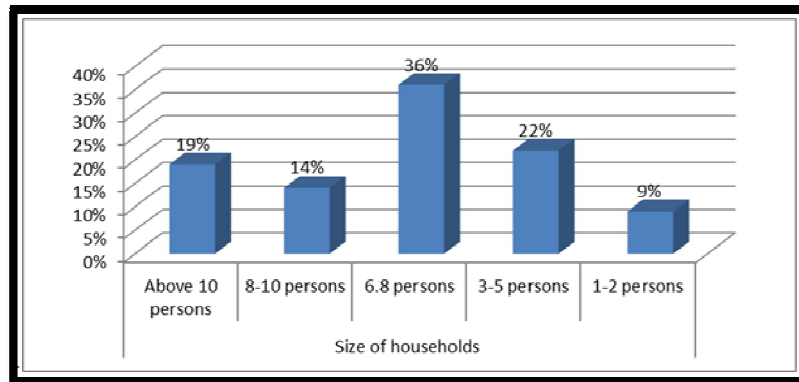
Figure 7: Size of Household
Source: Survey Data (2019)

Figure 7 presents data on the size of household of the respondents, based on the data, 36% of the respondents reported a household of 6-8 persons, 22% reported a household of 3-5 persons,14% reported a household of 8-10 persons while 19% reported a household of above 10 persons. However, only 9% of the respondents reported a household of 1-2 persons.
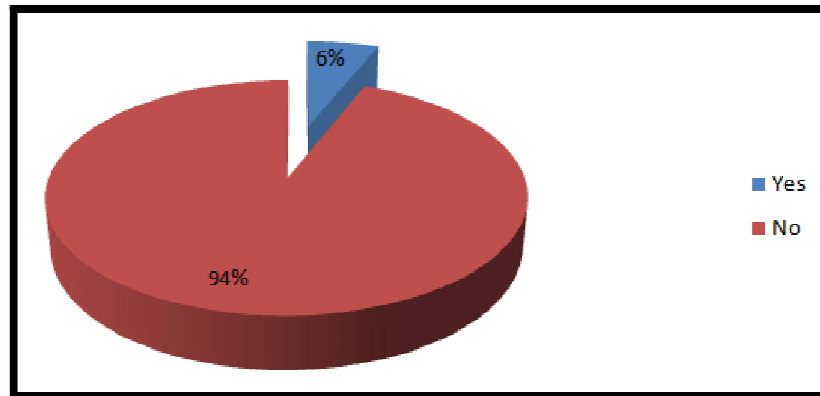

Figure 8: Previous Training on Diabetes Management
Source: Survey Data (2019)

As presented in figure 4.8, 94% of the respondents indicated that they had not undergone any training on diabetes management, only 6% of the respondents agreed that they had undergone training on diabetes management.
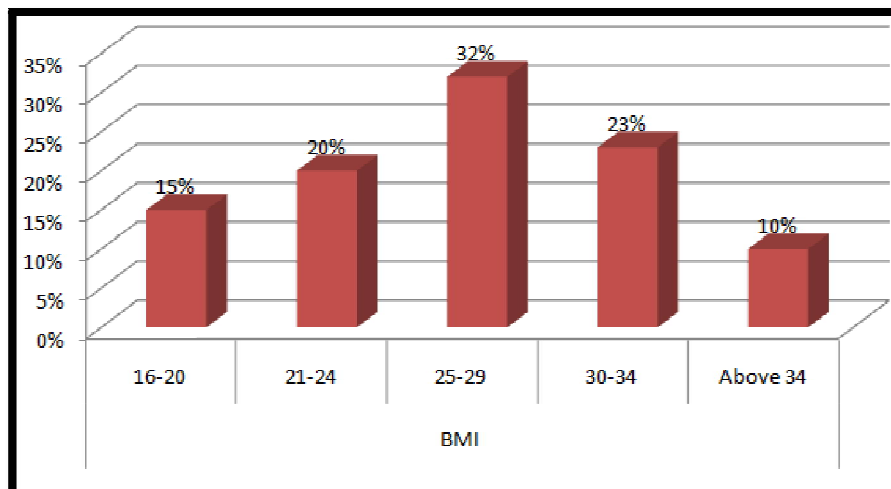
4.2. Intervention Baseline

Figure 9: BMI

Figure 4.9 presents data on BMI of the respondents, based on the data, 32% recorded a BMI ranging between 25 Kg/m² and 29 Kg/m², 23% recorded BMI values ranging between 30-34 Kg/m², 20% recorded a BMI ranging between 21 Kg/m² and 24 Kg/m². Only 10% of the respondents recorded BMI values above 34 Kg/m².

5. Conclusions, Recommendation and Suggestions for Further Research

The findings of this study revealed an insignificant change in the levels of BMI and total Cholesterol in baseline and midterm, the insignificant changes in the levels of BMI and total cholesterol may be attributed to the improvement of living standards, changes in dietary structure, and reduction of physical activity due to low levels of knowledge and awareness on effective diabetes management. The findings are in line with a study by Trento et al. (2014) which established that BMI decreased over 6 months among study participants (−1.4, 95% CI; −2.0 to −0.7), but there was no statistically significant difference observed. Furthermore, a difficulty in the reduction of BMI was mentioned in the study by Scainet al., (2009) which also showed no differences when compared with normal care, although the BMI did decrease significantly when compared with the baseline. An effective model to deliver diabetes care as group education sessions, which improves clinical outcomes, patients' quality of life, and clinicians' satisfaction while optimizing use of the typically limited resources of busy clinics should also be considered.

To reduce the time spent on health education, it is essential to provide health education materials with pamphlets and booklets used as good references by educated patients.

All health education should be provided with booklets and video as a matter of urgency particularly in those that do not have enough T2DM health educators. Therefore, the provision of health education materials is a matter of urgency.

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