**International Journal of Medical Science and Health Research**

Vol. 3, No. 06; 2019

ISSN: 2581-3366

# Effect of Lifestyles on Management of Diabetes Mellitus Type 11: An Empirical Investigation from Garissa County, Kenya

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**Abstract**

Among all non-communicable diseases (NCDs), diabetes mellitus type II (DM2) is associated with the highest co-morbidities and complications affecting people of diverse social-economic status. In 2012, an estimated 422 million people in the world comprising 2.3 million in sub-Saharan Africa (SSA) had DM2. DM2 is an increasing public health burden in Kenya, and is projected to reach 4.5% by 2025. Effective interventions for DM2 comprise individualized health education, lifestyle and behavioral change, physical exercise, nutritional and diet, weight and blood glucose monitoring, and pharmacological programs. However, in Kenya individuals suffering DM2 are frequently diagnosed with advanced disease predisposing them to increased risk of developing co-morbidities and complications. Although records at Garissa County Hospital show that only one-hundred and twelve adults are currently attending diabetes clinics, the prevalence of the disease at county level is unknown. In addition, these patients mainly receive chemotherapeutic care, with 35% defaulting the treatment and predisposing them to increased disease burden and death. Despite studies showing that health education and behavioral change predict plasma levels of the biochemical markers and physiologic changes in the DM2 patients and those at risk of the disease, these markers have not been integrated into control and management of the disease in Garissa County. Therefore this study determined the effect of knowledge levels 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. Based on the finding, it was clear that most of the respondents were aware of several factors associated with diabetes. For instance, 68% of the participants were aware that it is not true that eating too much sugar and sweet foods is a cause of diabetes (Mean:1.18; SD=0.387),97% were aware that it is false that Diabetes is caused by the kidneys' difficulty in keeping the urine without sugar (Mean=1.83; SD=0.387), all the participants were aware that it is false that regular exercise increases the need for insulin or other medicine for diabetes (Mean=2.00; SD=.000),82% of the respondents were aware that it is false that Hypoglycemia (low blood sugar) is caused by too much food (Mean=1.99; SD=0.110). 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

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ISSN: 2581-3366

## 1.0 Introduction

DM2 is a significant global public health issue mostly in developing countries, Kenya included, due to its dramatic increase and rise in obesity (Fatema, et al., 2017) (WHO, 2014). WHO has called on governments to address to the increasing diabetes burden (WHO, 2014). Kenya Government's National Medium Term Plan (2014-2018) and National Health Strategic Plan (2014-2018) prioritize prevention and control of DM2.

Socioeconomic status highly dictates the lifestyle in individuals. Lifestyle is broadly defined by nutrition, physical activity and location of residence. Study in Middleborough and Cleveland U.K in a deprived community established an inverse relationship between the prevalence of diabetes and socioeconomic status (Connolly et al, 2000). According to literature, adaptation of urbanized lifestyle has contributed to a rise in levels of obesity and overweight in the population increasing the risk for diabetes (Maina, et al., 2010). Poor dietary habits are defined as risk factors for DM2 (WHO, 2007). Different lifestyles expose people to different dietary habits. Poor dietary habits including ingestion of food that is rich in low density lipoprotein found in red meat, eggs, and dairy products; refined starches as found in refined sugars (candy, cakes, etc.) are associated with increased risk for DM2 (Ruchugo, 2015). Poor dietary habits and lack of physical inactivity have been highly associated with overweight and obesity (WHO, 2014).

In Sao Paulo, Brazil, malnutrition in children, and obesity and overweight in adults were main risk factors (El-busaidy, et al., 2014). Data on the level of obesity in sub-Saharan Africa is inadequate, but it varies between 3-44% of the population, depending on ethnicity and urban or rural location (Ruchugo, 2015). A study in Bangladesh among children and adolescents established increasing trends in the prevalence of DM2 which was associated to increasing overweight and obesity (Biswas, et al., 2017). Study among under-privileged society in New Delhi established DM2 13% males and 16% females who were obese (Misra, et al., 2001). The 2003 Kenya Demographic and Health Survey found out that 20% of women and 7% of men in the country were overweight or obese (Maina, et al., 2010). WHO reported decline in physical activity as a result in increased dependence on motorized transport and replacement of playgrounds with buildings in Kenya, which also posed as a risk (WHO, 2014). In Kenya, abdominal obesity was a risk factor for the population especially females. A study on risk factors for DM2 among patients attending a rural Kenyan hospital established that childhood starvation and use of cassava for sustenance during childhood starvation as risk factors (Chege, 2010).

## 2.0 Literature Review

Some of Africa's most populous countries have the highest numbers of people with diabetes, including South Africa 2.3 million, Democratic Republic of Congo 1.8 million, Nigeria (1.6 million) and Ethiopia 1.3 million) (IDF, 2015). DM2 was reported to be on the rise in northern Tanzania (Miller, 2013). Crude prevalence estimate for DM2 in Tanzania was 9.0%, while the indirect age-adjusted prevalence rate was 2.79%.

DM2 is the more prevalent in Kenya whereby the age of onset is lower than others in developed countries (Mcferran, 2008). Currently, there are more people with diabetes in urban (269.7

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ISSN: 2581-3366

million) than in rural (145.1 million) areas. In low- and middle-income countries, the number of people with diabetes in urban areas is 186.2 million while 126.7 million live in rural areas. By 2040, globally the difference is expected to widen, with 477.9 million people living in urban areas and 163.9 million in rural areas (IDF, 2015).

In the African Region, majority of people with diabetes live in urban areas, even though the population in the region is predominantly rural (IDF, 2015). Studies in East Africa (Tanzania, Kenya, & Mozambique), West Africa (Cameroon, Nigeria, Ghana, & Guinea), and South Africa identified a higher rate of DM2 in the urban dwellers with an increasing trend in prevalence rates (Miller, 2013; Joshi & Aravind, 2017).

High prevalence of diabetes in under-privileged communities has been attributed to poor eating habits and high level of physical inactivity (El-busaidy, et al., 2014). In Kenya, abdominal obesity was associated with risk of diabetes in the population especially among the females (Chege, 2010). With urbanization and the busy office jobs, the tendency to inactivity has risen significantly. People ride vehicles to work, take lifts to their offices and spend hours seated (Ruchugo, 2015). Recent studies have shown even higher figure of 60.3% and 19.5% for women and men respectively in urban areas this is compared to 22.6% and 10% in women and men respectively in rural areas (Maina, et al., 2010).

## 3.0 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

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inclusion and exclusion criteria formed the sampling frame. DM2 patients were voluntarily recruited into the treatment and control arms. The study was conducted in Garissa 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).

## 4.0 Results and Discussion

The researcher sought to establish the frequency of alcohol intake by respondents. Figure 1 presents data on the participants' level of alcohol intake, based on the data, a greater proportion of the participants (20%) reported taking 1-2 bottles of alcohol in a week, 70% didn't take alcohol at all while only 10% took more than 2 bottles of alcohol in a week.

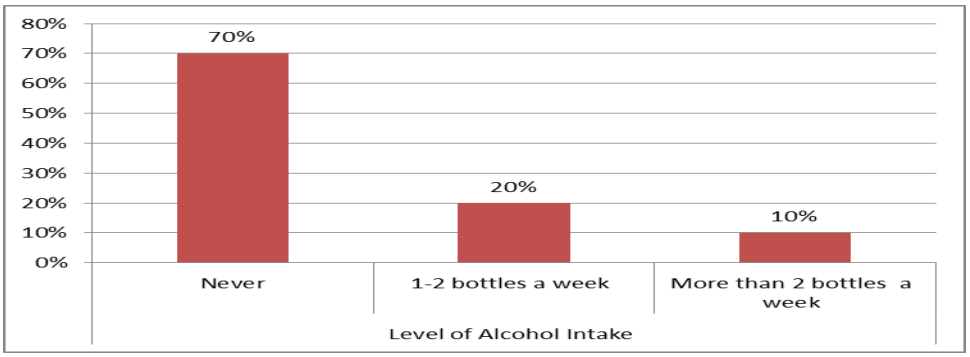


**Figure 2:** Frequency of Alcohol Intake

**Source:** Survey Data (2019)

The researcher sought to establish the frequency of cigarette smoking by the respondents during midterm, based on the data 71 % of the participants reported having never used tobacco, 10% used tobacco once a week while 19% used more than once a week.

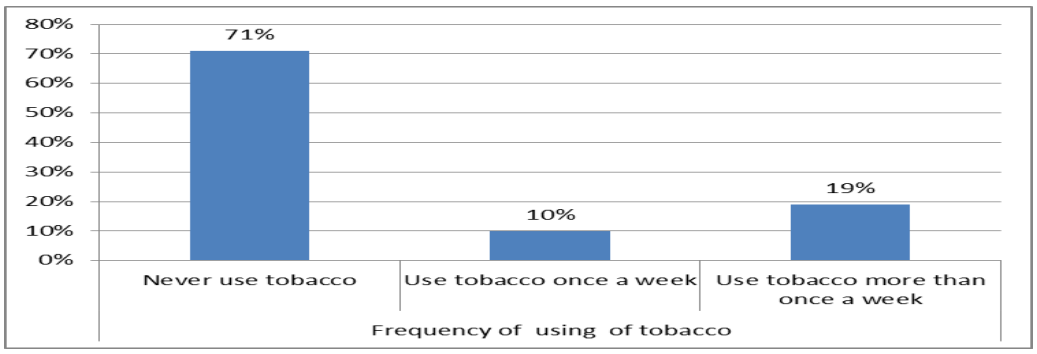


**Figure 2: Frequency of Cigarette Smoking/use of tobacco**

**Source:** Survey Data (2019)

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**5.0 Conclusions, Recommendation and Suggestions for Further Research**

Results from data analysis indicated that cigarette smoking and alcohol consumption affects of diabetes Mellitus type 11. The study therefore conclused that there is a positive relationship between lifestyle and diabetes mellitus type 11. The results of this study provides key information for formulating strategies and policies for comprehensive and sustainable diabetes management by County and Ministry of health.

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