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Knowledge on Risk Factors of Diabetes Mellitus 2 Among Students in Selected Universities in Rwanda

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Abstract:-

- ***Background or Objectives:***

The incidence of diabetes mellitus 2 among youths has increased. The objectives were to assess the level of knowledge regarding risk factor for Diabetes mellitus 2 in selected universities in Rwanda.

- ***Methods:***

A descriptive cross-sectional study was done on. The study employed both proportionate stratified sampling and simple random sampling techniques to select the participants. A close-ended and pretested questionnaire was used to capture students' information. A total of 384 students filled the questionnaire satisfactorily. Data was verified for comprehensiveness and uniformity, entered in computer and coded using SPSS (Statistical Package for Social Scientist) version 26 for data analysis.

- ***Results:***

Most of the respondents (61.5%) had moderate level of knowledge on risk factors of Diabetes mellitus 2. However, about a quarter (25.3%) had low level of knowledge and those with high level of knowledge on the same were 12.9%.

- ***Conclusion And Implications For Translation:***

The study concludes that the overall level of knowledge on risk factors for Diabetes mellitus 2 among students was above average and adequate.

Keywords:- *[Mount Kenya University; Diabetes Mellitus 2; Knowledge]*

I. INTRODUCTION

A. Background of the Study

The incidence of diabetes mellitus 2 is on the rise globally. According to the 2017 International Diabetes Federation (IDF) estimates, about 425 million adults have diabetes mellitus. This figure is projected to increase to 629 million adults by 2045, which is a 48% increase (IDF Diabetes Atlas 8th Edition 2017)

Internationally there was a record of 53 million deaths in the year 2010; Forty (40) million of these deaths which represent 75% were caused by non-communicable disease. Diabetes accounted for 0.8 million of the total deaths which is about 2% of the total global deaths globally (WHO, 2014).

Diabetes mellitus 2 is major challenge for health and development in Africa in the 21st century. This disease is for sure a preventable disease but it is currently a killer disease accounting for millions death annually, bankruptcy, and high degree of morbidity. It does not discriminate poor or rich, all are bowed down by it. Currently Africa has an estimated 16 million adults living with Diabetes mellitus 2 , this translate to a regional prevalence of 3.1 %.Global projection indicate that it will experience an exponential increase in incidence of diabetes of about 156% by year 2045 (IDF Diabetes Atlas 8th Edition 2017).

Disease pattern is changing from communicable to non-communicable in Rwanda like other low-income countries due to epidemiological shift (Ministry of Health, 2014). Diabetes happens to be among the overriding NCD in Rwanda, other common and non-communicable disease that have high prevalence include cancer, respiratory diseases, injuries caused by road accident and physical disability (Ministry of Health, 2014).

In 2014, World Health Organization non-communicable diseases analysis of Rwanda recorded 78,000 deaths, of this death 28,080 were attributed to non-communicable disease which represent 36% of total deaths (WHO, 2014). The prevalence of diabetes in Rwanda is about 3.06 % (Rwanda non-communicable disease report 2015).

The genesis of diabetes mellitus 2 is associated with environmental factor and genotypic factors. Environmental factor includes poor eating habits, inactiveness, certain physiological conditions in the body, alcohol and tobacco consumption (Finlayson *et al*, 2012).

The basic characteristic of diabetes is total or relative shortage of insulin hormone; it is the only hormone that is involved in glucose metabolism in the body therefore bringing blood glucose concentration down. Reduced secretion of insulin by pancreas cell and diminished sensitivity of body cells to it action begets Diabetes mellitus 2 (American Diabetes Association 2010). Diabetes mellitus 2 will strike in at the age of 40, but some time the onset can come earlier at the age of 20 years. It is occasioned when the body is not able to utilize or produce optimum insulin whose purpose is to get glucose inside the body cells (Bilous, 2010).

B. Objectives of the Study

➢ *Specific Aims and Hypothesis*

To assess the level of knowledge regarding risk factor for Diabetes mellitus 2 among students in selected universities in Rwanda.

II. METHODS

A. Study Population

The study population in this study consisted of 2780 students enrolled in Mount Kenya University Kigali campus and 978 students enrolled in Gitwe University Rwanda. It is also from this group that the researcher obtained the study sample.

B. Research Design

Descriptive cross-sectional study design research was used for this study.

C. Sample Size Determination

The sample size was calculated using Yamane formula for sample size determination for defined small population (N) (2780 and 978 =3758) and margin error of 5% (Yamane, 1967). Then the sample size was distributed according to the proportion of population size (n_x = (N_x / N) * n) in each university.

$$n = N / \left(1 + N\left(e\right)^2\right)$$

n = 3758 ÷ [1+3758(0.05) ^2] =362,
F
or Mount Kenya University = n_x = (N_x / N) * n = 2780/3758*362 =268

For Gitwe University= = n_x = (N_x / N) * n = 978/3758*362 ==94

This actual number was then derived from sample sizes from the stratums (departments) calculated through proportionate stratification in a manner that allowed sample size of each stratum to be directly proportional to their respective population size using the formula highlighted below:
n_x = (N_x / N) * n
key,
n is total sample size
n_x is the sample size for stratum *x*
N_x is the population size for stratum *x*
N is total population size,

University	Stratum	Population	Formula	Sample Size
Mount Kenya university	Department of Medical Laboratory science	146	n_x = (146 / 2780) * 268	14
	Department of Nursing	266	n_x = (266 / 2780) * 268	26
	Department of business management	1280	n_x= (1280 / 2780) * 268	123
	Department of Public Health	180	n_x = (180 / 2780) * 268	18
	Department of journalism	208	n_x= (208 / 2780) * 268	20
	Department of education	700	n_x = (700 / 2780) * 268	67
Gitwe university	Department of education	430	n_x = (430 / 978) * 94	41
	Department of Nursing	266	n_x = (266/ 978) * 94	26
	Department computer science engineering	180	n_x = (180 / 978) * 94	17
	Department computer science management	102	n_x = (102 / 978) * 94	10
	Total	3578		362

Table 1:- Strata Sample Size Distribution for the Respondents
Source: Researcher

D. Sampling Technique

The study employed both proportionate stratified sampling and simple random sampling techniques. Proportionate stratified sampling technique involved dividing the two study population into strata separately as shown in table 2 and then applying simple random sampling methods on each stratum to obtain the final study sample size. Simple random sampling method was applied in each stratum to select the required number of students per department (Ben-Shlomo *et al* 2013).

E. Data Collection Method

Level of knowledge was determined by administering a set of alpha cronbach questions that are related to risk factors of Diabetes mellitus 2. The respondent either replied with true, false or I don't know. Each question answered correctly attracted one mark, which was always a yes. The aggregate was converted into percentages and the level of knowledge was classified as follows: Low (< 50%), Moderate (50-69%) and High (70% and above).

F. Statistical Analysis

Data was verified for comprehensiveness and uniformity, entered in computer and coded using SPSS (Statistical Package for Social Scientist) version 26 for data analysis. The data was analyzed and interpreted according to the objectives of this study. Tables and figures have been used for results presentation (Coghlan *et al 2014*).

G. Ethical Approval

Certificate of ethical clearance was issued by Mount Kenya University Ethics Review Committee on 20th September 2018 after a review that found out that all ethical concerns had been addressed. The questionnaire forms filled did not bear the name of the participant and was kept in a lockable cabinet. The finding of this study will be timely disseminated to the entire relevant stakeholders without prejudice. Participants were engaged in this study in a voluntary manner without any coercion or bribery after clear explanation of the topic and purpose of the study.

III. RESULTS

A. Sociodemographic Characterisitcs

Variables	Frequency (N=348)	Percent (%)
University enrolled		
Mount Kenya University	259	74.4
Gitwe University	89	25.6
Age in years		
19-25	243	69.8
26-30	51	14.7
31-35	29	8.3
>35	25	7.2
Gender		
Male	183	52.6
Female	165	47.4
Residence		
Urban	199	57.2
Rural	149	42.8
Student living arrangement		
Live alone	92	26.4
Live with student	103	29.6
Live with parent/guardian	153	44.0
Occupation		
Employed	68	19.5
Self employed	77	22.1
Student	203	58.3
Family history of diabtes2		
Yes	17	4.9
No	308	88.5
Not sure	23	6.6

Table 2:- Socio-Demographic Characteristics of the Respondents
Source: Researcher

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According to Table 2, about three quarter of the respondents (74.4%) were from Mount Kenya University Kigali Campus while the remaining (25.6%) were from Gitwe University. Majority of the students were aged between 19 to 25 years at a percentage of 69.8%. Slightly more males (52.6%) participated in the study compared to females (47.4%). More than half (57.2%) were from urban areas. Regarding living arrangement, the highest percentage was living with their parents or guardians at 44 %. In concern to occupation, most of them were students (58.3%). The respondents were asked whether there was any family history of diabetes mellitus 2 and 4.9% indicated family history of Diabetes mellitus.

B. Knowledge Regarding Risk Factor for Diabetes mellitus 2 among the Students

An analysis of knowledge regarding risk factors of Diabetes mellitus 2 is summarized in Table 3.

Variables	Frequency (N=348)	Percent (%)
Increased physical activity decrease diabetes mellitus 2		
Yes	268	77.0
No	54	15.5
Do not know	26	7.5
Family history increases diabetes mellitus 2		
Yes	232	66.7
No	68	19.5
Do not know	48	13.8
Obesity and overweight increases diabetes mellitus 2		
Yes	275	79.0
No	24	6.9
Do not know	49	14.1
Hypertension is major risk for diabetes mellitus 2		
Yes	144	41.4
No	23	6.6
Do not know	181	52.0
Sugary and oily food increase chances of diabetes mellitus 2		
Yes	240	69
No	20	5.7
Do not know	88	25.3
Alcohol consumption increases chances of diabetes mellitus 2		
Yes	127	36.5
No	35	10.1
Do not know	186	53.4
Tobacco use is a risk for diabetes mellitus 2		
Yes	121	34.8
No	39	11.2
Do not know	188	54.0
Good diet reduce the chance of diabetes mellitus 2		
Yes	247	71.0
o	43	12.4
Do not know	58	16.7
Regular screening for blood glucose levels is a good practice that can help one to detect pre-diabetic stage before type II diabetes sets in		
Yes	125	35.9
No	97	27.9
Do not know	126	36.2
Diabetes mellitus 2 is potentially avoidable disease if its risk factors are identified early and avoided		
Yes	175	50.3
No	102	29.3
Do not know	71	20.4

Table 3:- Knowledge Regarding Risk Factor for Diabetes mellitus 2 among the Students
Source: Researcher

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Majority of the students (77.0%) indicated that increased physical activity can decrease chances of getting diabetes mellitus 2 while the remaining reported otherwise. Considerable percentage of respondents (19.5%) was not aware that family history increases diabetes mellitus 2 and 13.8% did not know whether it is a risk for diabetes mellitus 2. Although majority (79.0%) of the respondents indicated that obesity and overweight increases diabetes mellitus 2, considerable percentage 14.1% did not know. Surprisingly, more than half (52.0%), (53.4%) and (54.0%) were not aware that having hypertension, alcohol consumptions and tobacco use are risk factor for diabetes mellitus 2 respectively.

About a quarter (25.3%) also did not know that sugary and oily food increase chances of diabetes mellitus 2. Most of the respondents (71.0%) claimed that healthy or good diet can reduce the chance of diabetes mellitus 2 while the remaining either indicated otherwise (12.4%) or did not know (16.7%). About a quarter (27.9%) indicated that regular checkups for blood glucose levels are not a good practice that can help one to detect pre-diabetic stage. Similarly, considerable percentage (29.3%) said even if the risk factors of diabetes mellitus 2 are identified early, the disease cannot be avoided.

C. Level of Knowledge Regarding Risk Factor for Diabetes mellitus 2 among the Students

The level of knowledge on risk factor for Diabetes mellitus 2 among the students was assessed using the ten (10) statements presented in Table 3 and the score assessment is presented in Appendix iii. The maximum attainable score was 10 and the minimum score was 0. The aggregate was converted into percentages and the level of knowledge was classified as follows: Low (> 50%), Moderate (50-69%) and High (70% and above).

Most of the respondents (61.5%) had moderate level of knowledge on risk factors/causes of diabetes mellitus 2. However, about a quarter (25.3%) had low level of knowledge and those with high level of knowledge on the same were 12.9% (Figure 1).

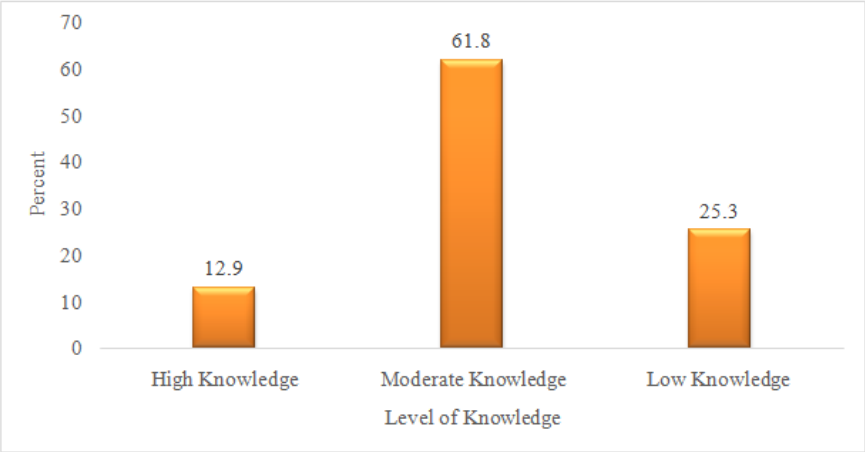

Figure 1:- Level of Knowledge Regarding Risk Factor for Diabetes mellitus 2 among the Students
Source: Researcher

IV. DISCUSSION

The current study revealed that the level of knowledge about Diabetes mellitus 2 among the students was good and acceptable knowledge at 61.5%.Questions on physical exercise as a way of alleviating Diabetes mellitus 2, obesity and overweight as a risk factor for Diabetes mellitus 2 and place of diet in reducing Diabetes mellitus 2 had a score of 77%, 79% and 71% respectively. Sugary and oily food as a risk factor of Diabetes mellitus 2 also had a good score of 69%.This is collaborated by a similar study on students where nearly 69.2% of cases had good and acceptable knowledge scores (Abuobaida *et al* 2017).

A research was carried out by Randy *et al* (2016) in India among Asian Indian to determine the extent of knowledge concerning Diabetes mellitus 2.The drive of the study was to help formulate public health education and preventive program to reduce new incidence of Diabetes mellitus 2.A sample size of 983 participant were selected from Visakhapatnam, Andhra Pradesh and data regarding risk factors, knowledge about Diabetes mellitus 2, lifestyle and prevention was collected. A large number of students were cognizant of Diabetes mellitus 2, 50% of the students selected were cognizant that Diabetes mellitus 2 is preventable and only 40 % were aware that physical activity could reduce chance of acquiring Diabetes mellitus 2. The findings obtained clearly indicate that customized preventive program need to be installed for this target population which also what the current study recommends.

In the current study, Most of the respondents (61.5%) had moderate level of knowledge on risk factors/causes of diabetes mellitus 2. However, about a quarter (25.3%) had low level of knowledge and those with high level of knowledge on the same were 12.9%. In a parallel study about health seeking behaviour in both rural and urban areas on non-communicable disease indicated that there was basic knowledge on causes and symptoms of NCD .This information is informal and formal and at time traditional or provided by health care workers, this is comparable to the current study (Idriss *et al* 2020).

V. CONCLUSION AND IMPLICATIONS FOR TRANSLATION

Knowledge of students toward Diabetes mellitus 2 risk factors was above average. For this reason the University should consider developing improved healthy lifestyle educational programs that will inculcate good knowledge that will encourage students to purposefully make wiser dietary choices and develop healthier habits.

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