https://www.inosr.net/inosr-experimental-sciences/
Kavubu
INOSR Experimental Sciences 12(2):119-131, 2023.

International Network Organization for Scientific Research ISSN: 2705-1692
https://doi.org/10.59298/INOSRES/2023/2.9.1000

Incidence of Prediabetes and its Development Risk Factors among Bachelor Students at Kampala International University's Western Campus in Uganda

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ABSTRACT

Prediabetes marks blood glucose levels above normal yet below the diabetes threshold. Its prevalence is escalating worldwide, with projections estimating over 470 million affected individuals by 2030. Notably, there is a dearth of studies offering insight into prediabetes prevalence among university students in Uganda. This research was designed to assess prediabetes prevalence and associated risk factors among apparently healthy Kampala International University Western Campus (KIU-WC) bachelor students. Employing a prospective cross-sectional study design, the investigation involved structured self-administered questionnaires, anthropometric measurements, and blood biochemistry, targeting registered university students of all ages at KIU-WC. Sample size calculations were based on a formula, with BMI for age and sex referenced against Agarwal charts. Fasting blood glucose (FBG) levels were classified per ADA criteria. A total of 121 students (61.2% male, 38.8% female) aged 15-35 participated. Results indicated a significant prediabetes prevalence of 19.8%. Notably, prediabetes rates varied among distinct age groups, particularly higher among middle-aged or young adults (18-25 years). The study underscores lifestyle modifications as pivotal in preventing or delaying prediabetes progression to Type 2 Diabetes Mellitus (T2DM). Moreover, it highlights the necessity for further comprehensive prospective studies with larger sample sizes and adequate funding to precisely quantify prediabetes burden, its risk factors, complications, preventive measures, and validate the epidemiological findings observed in this investigation.
Keywords: Diabetes, Prediabetes, Lifestyle modification, Hypertension, Obesity.

INTRODUCTION

Diabetes also known as diabetes mellitus (DM) is a syndrome of impaired carbohydrate, fat and protein metabolism caused by either lack of insulin secretion or decreased sensitivity of the tissues to insulin [1-3]. There are generally two types of diabetes. Type 1 diabetes (Insulin Dependent Diabetes Mellitus) which is caused by a lack of insulin secretion. Type 2 diabetes (Non-Insulin Dependent Diabetes Mellitus) which is caused by decreased sensitivity of target tissues to the metabolic effect of insulin. The reduced sensitivity of insulin is often referred to as insulin resistance [4-6]. According to the World Health Organization (WHO), DM is a leading cause of death and disability worldwide [7, 8]. Its global prevalence was about 8% in 2011 and is predicted to rise to 10% by 2030. Nearly 80% of people with DM live in low and middle-income countries like Uganda. In Africa, 12.1 million people were estimated to be living with diabetes in 2010 and this is projected to increase to 23.9 million by 2030 with type 2 diabetes accounting for most cases. In Uganda according to the Uganda Diabetes

Association (UDA), the current prevalence of DM is 1.4% i.e. about 500,000 people have DM. Impaired Fasting Glucose (IFG) which is a risk factor for type 2 diabetes affects 2.1% of Ugandans. Higher prevalence of diabetes and prediabetes of 7.4% and 8.6% respectively have been reported in rural Eastern Uganda. The majority of people with high blood sugar are not aware of their blood sugar status. The mean age of people having diabetes in Uganda is 35 years. Also, the quality of diabetes care in Uganda is still inadequate or totally poor [9]. Diabetes affects the quality of life, has a major impact on people's families and has a significant public health impact. People being diagnosed with diabetes are at high risk of having diabetic neuropathy, blindness due to diabetic retinopathy, hypertension, and kidney diseases due to diabetic nephropathy, stroke, heart diseases, dental diseases and amputations [10-13]. Before people develop type 2 diabetes, they undergo a risk state called prediabetes intermediate hyperglycemia or preclinical state. This prediabetes phase provides an opportunity to identify the patients and initiate timely prevention. Prediabetes, typically defined as blood glucose levels above normal but below diabetes threshold is a risk state that defines a high chance of developing type 2 diabetes. ADA classifies prediabetes as the initial stage of acquiring diabetes. It is a practical and convenient term referring to Impaired Fasting Glucose(IFG), Impaired Glucose Tolerance(IGT) or a glycated haemoglobin (A1C) of 6.0% to 6.4%, each of which places individuals at high risk of developing diabetes and its complications [14, 15]. The prevalence of prediabetes is increasing worldwide and its projected that above 470million people will have prediabetes in 2030. WHO and ADA refer to prediabetes as "high risk of developing diabetes". High risk of developing diabetes is associated with the simultaneous presence of insulin resistance and β-cell dysfunction. Risk factors associated with development of prediabetes and diabetes include family history of diabetes, sedentary life style, obesity, age, sex, lack of physical activity, stress, hypertension, fast food consumption [16, 17]. Awareness and knowledge regarding prediabetes, its management, complications and risk factors are crucial for steps for its control and better quality of life. Lifestyle modification is the cornerstone of prediabetes and diabetes prevention with evidence of a 40% to 70% relative risk reduction. To the best of my knowledge, there are hardly any studies providing the prevalence of prediabetes among university students in Uganda. This research is planned to study the prevalence of prediabetes and determine associated risk factors in apparently healthy university students.

METHODOLOGY

Study Design

The research adopted a prospective cross-sectional study design. This was used because the method gathers data from a relatively larger number of different categories of respondents at a particular time.

Area of Study

This study was carried out at KIU-WC; located in Ishaka Town, Bushenyi District, Western Uganda, approximately 330km (210 miles), by road, Southwest of Kampala, Uganda. Ishaka town is 61.27Km, 38.07miles from Mbarara. Mbarara town is 266.79Km from Kampala by road. The coordinates of KIU-WC are 0°32'19.0" S, 30°08'40.0" E (Latitude: -0.538611; Longitude: -30.144444). KIU-WC is located approximately 100m North of Ntungamo-Kasese road junction along Mbarara-Ishaka road in Ishaka town, Ishaka-Bushenyi Municipality, Bushenyi District, Uganda.

Study Population

The population was approximately 1000 registered bachelor students studying at KIU-WC.

Inclusion criteria

- Registered bachelor students who currently study at KIU-WC, Ishaka-Bushenyi municipal council-Bushenyi district.

- Those who consented to participate in the study.

Exclusion criteria

- Non-students of KIU-WC e.g. Staff members.
- Non-Bachelor level students.
- Students who were known to have diabetes.
- Students who were unwilling to take part in the study thus did not consent.
- Students who were unwilling to answer questions fully on the questionnaire.
- Those who were absent.

Sample Size Determination

The sample size was calculated using Fishers et al. [18] formula. The formula was used to estimate the smallest possible categorical sample size required.

$$n = \frac{z^2 pq}{d^2}$$

Where;

n =Minimum sample size

z =Standard normal deviation corresponding to 1.96

p =Existing prevalence of prediabetes in the region (8.6)

$q = 1 - p$

d =Margin of error (0.05)

Thus taking;

$p = \frac{8.6}{100} = 0.086$

$z = 1.96$

$q = 1 - 0.086$

$= 0.914$

$d = 0.05$

$$n = \frac{(1.96)^2 \times 0.086 \times 0.914}{(0.05)^2}$$

$n = 120.8$

$n \sim 121$

Thus 121 students were recruited in this study.

Sampling Procedure

A simple random sampling was used. A YES or NO was written on different papers, folded, put in a container and mixed well. Then a student picked one at a time randomly without replacing. One who picked a YES was recruited into the study and the other who picked a NO was excluded from the study irrespective of his or her faculty.

Data Collection techniques/methods and tools

Quantitative Methods

A structured self-administered questionnaire was used to collect the data. The questionnaires were close-ended items for ticking YES or NO and making choices among a number of possible alternatives and fill-in items. The questionnaire collected individual information regarding the age, sex, history of fast food consumption, history of physical activity 30-50 minutes per day thrice a week (sports), and history of diabetes in any one of the parents. It also included a result section for the blood pressure (mmHg), anthropometric measurements of weight (kg) and height (m), Body Mass Index (BMI)(kg/m²) and Fasting Blood Glucose(FBG)(mmol/L) test results. BMI was calculated from;

$$BMI = \frac{weight(kgs)}{height(m^2)}$$

Agarwal charts of BMI for age and sex were used as reference standards.

FBG test procedure;

- A participant was required to fast overnight without eating any food or drinking other fluids like juice or soda except water for about 8-12 hours then the test was scheduled for early in the morning the next day.
- Obtain consent, perform hand washing, put on gloves and insert a test strip into the glucometer ensuring that the proper end is inserted inwards. Then antiseptically clean with an alcohol swab an area on the finger you are going to prick.
- Prick the side of the fingertip with a lancet or pricker, massage that finger to let the blood out and let it form a small bead on the finger.
- Hold the finger to let the bead of blood touch the tip of the test strip inserted in the glucometer. Then a piece of cotton swab is placed on the pricked area and pressure is applied to control bleeding.
- The results showed up on the digital screen of the glucometer, then recorded

in mmol/L then recorded in the result section of the questionnaire.

Fasting blood glucose levels as recommended by the ADA criteria were used to state a participant's FBG status as normal, prediabetes or diabetes.

Quality Control Techniques

There were measures put in place to ensure quality control and validity of data and findings of the study. A pretested questionnaire was used. Prior to field data collection, data collectors were oriented about the research, the instruments and the field procedures required for effective and efficient field data collection. During the FBG procedure, aseptic technique was applied. Field data was edited and entered using the SPSS version 17.0.

Data Entry and Analysis Plan

FBG levels were defined according to the ADA criteria, FBG between 100 to 125 mg/dl or 5.6 to 6.9 mmol/L is prediabetes. FBG above 126 mg/dl or 7.0 mmol/L is considered diabetes. FBG less than 100 mg/dl or 5.6 mmol/L is considered normal. Prepared data sheets were used to enter data obtained from the participants. Data collected on the data sheets were then transferred into Microsoft excel 2007, checked for errors and then exported to SPSS for both descriptive and analytical processing. Data collected was analyzed statistically using Microsoft excel 2007, and presented in the form of frequency tables.

RESULTS

Socio-Demographic Characteristics

Table 1: In our study, 121 participants were involved in data collection with 74(61.2%) males and 47(38.8%) females. Most of the participants 94(77.7%) were in the age group (21-25) years followed by 17(14.0%) in the age group (26-30) then 9(7.4%) in (15-20) years age group and lastly 1 participant (0.8%) in the (31-35) years age group. Of the 121 participants, 12(9.9%) had ever tested for prediabetes or diabetes and 109(90.1) had never tested. Of those who had ever tested for diabetes 9(7.4%) had an RBS level < 5.6mmol/L and 2(1.7%) had an RBS level between 5.6-6.9mmol/L.

Table 1: Socio-demographic characteristics of study participants i.e. bachelor students in KIU-WC, Ishaka-Bushenyi Municipality, Bushenyi District Western Uganda.

Variables	Summary Measurement
Age(Years) N (%)	
15-20	9(7.4)
21-25	94(77.7)
26-30	17(14.0)
31-35	1(0.8)
Gender N(%)	
Male	74(61.2)
Female	47(38.8)
Ever Tested For Prediabetes/Diabetes N(%)	
Yes	12(9.9)
No	109(90.1)
Has Ever Tested For Prediabetes/Diabetes N(%)	
<5.6 mmol/L	9(7.4)
(5.6 – 6.9) mmol/L	2(1.7)
>7.0 mmol/L	0
Not applicable	110(90.9)

Prevalence of Prediabetes among KIU-WC Bachelor Students

Table 2: In our study, of the 121 participants, 24(19.8%) members had FBG between (5.6-6.9)mmol/L which is prediabetes, 92(76.0%) members had FBG < 5.6mmol/L which is normal and only 5(4.1%) members had FBG > 7.0mmol/L which is diabetes.

Table 2: Prevalence of prediabetes among KIU bachelor students

Variables	Summary Measurements
Fasting Blood Glucose (Mmol/L) N(%)	
<5.6	92(76.0)
(5.6-6.9)	24(19.8)
>7.0	5(4.1)

Risk Factors Associated with Prediabetes Development Among KIU-WC Bachelor Students

Family History

Table 3: In our study, 27(22.3%) participants had a 1st-degree family relative who had ever been diagnosed with diabetes and 94(77.7%) participants did not. Of the 1st degree family relatives who had ever been diagnosed with diabetes, 17(14.0%) were fathers and 10(3.8%) were mothers. Also 38(31.4%) participants had a 2nd-degree family relative who had ever been diagnosed with diabetes, 83(68.6%) did not have. Of the 2nd degree family relative who had ever been diagnosed with diabetes, 10(8.3%) were uncles, 10(8.3%) were aunts, 3(2.5%) were nephews, 3(2.5%) were cousins 12(9.9%) were grandparents.

Table 3: Family history

Variables	Summary Measurements
1st Degree Family History N(%)	
Yes	27(22.3)
No	94(77.7)
1st Degree Family History (Who?) N(%)	
Father	17(14.0)
Mother	10(8.3)
Sibling	0
Not Applicable	94(77.7)
2nd Degree Family History N(%)	
Yes	38(31.4)
No	83(68.6)
2nd Degree Family History (Who?) N(%)	
Uncle	10(8.3)
Aunt	10(8.3)
Nephew	3(2.5)
Cousin	3(2.5)
Grand Parent	12(9.9)
Not Applicable	83(68.6)

Hypertension

Table 4: In our study 5(4.1%) of participants were found to be hypertensive or on hypertension therapy and 116(95.9%) were non hypertensive. Also 78(64.5%) participants had a normal blood pressure (<120/80 mmHg), 36(29.8%) had an elevated blood pressure (120-139/80-89) mmHg and 7(5.8%) had a 1st stage hypertension (140-159/90-100) mmHg.

Table 4: Hypertension

Variables	Summary Measurements
Hypertensive/Hypertension Therapy N(%)	
Yes	5(4.1)
No	116(95.9)
Blood Pressure (mmHg) N(%)	
<120/80	78(64.5)
(120-139)/(80-89)	36(29.8)
(140-159)/(90-100)	7(5.8)
>160/100	0(0.0)

Gestational Diabetes

Table 5: In our study, all the female participants 47(38.8%) were found to have no gestational diabetes.

Table 5: Gestational diabetes

Variables	Summary Measurements
Gestational Diabetes N(%)	
Yes	0
No	47(38.8)
Not Applicable	74(61.2)

Cigarette Smoking

Table 6: In our study, 3(2.5%) participants had ever smoked cigarettes for above one week in the past and 118(97.5%) did not. Among those who currently smoke for above one week, only one participant (0.8%) was identified, leaving 120(99.2%) who do not currently smoke

Table 6: Cigarette smoking

Variables	Summary Measurements
Smoked Cigarettes In The Past N(%)	
Yes	3(2.5)
No	118(97.5)
Smoked Cigarettes In The Past For How Long N(%)	
Above 1 Week	3(2.5)
Not Applicable	118(97.5)
Currently Smoking Cigarettes N(%)	
Yes	1(0.8)
No	120(99.2)
For How Long Have You Been Smoking Cigarettes N(%)	
Above 1 Week	1(0.8)
Not Applicable	120(99.2)

Physical and Vigorous Activities

Table 7: In study, 85(70.2%) participants do walk or bicycle pedal while 36(29.8%) do not. Among those who walk or bicycle pedal, 4(3.3%), 19(15.7%) and 62(51.2%) do it for 1 day, (2-3) days and 4 days and above respectively and also 15(12.4%) spend 29 minutes and below and 70(57.9%) spend 30 minutes and above doing bicycle pedaling in a day. Also, 55(45.5%) of participants do vigorous activities which cause a large increase in breathing or heart rate while 66(54.5%) do not. Of those who do vigorous activities, 5(4.1%), 33(27.3%) and 17(14.0%) spend 1 day, (2-3) days and4 days & above respectively. And 14(11.6%) spend 29 minutes & below and 41(33.9%) spend 30

minutes % above of their time. Also, 55(45.5%) of the participants do vigorous activities which cause a small increase in breathing or heart rate while 66(54.5%) do not. Of those who do these vigorous activities, 11(9.1%), 27(22.3%) and 17(14.0%) spend 1 day, (2-3) days and 4 days & above respectively. And, 15(12.4%) spend 29 minutes & below and 40(33.1%) spend 30 minutes & above of their time.

Table 7: Physical and vigorous activities

Variables	Summary Measurement
Walk/Bicycle Pedaling N(%)	
Yes	85(70.2)
No	36(29.8)
If Yes, (A) Days You Walk Or Pedal For More Than 30 Minutes N(%)	
1 Day	4(3.3)
(2-3) Days	19(15.7)
4 Days & Above	62(51.2)
Not Applicable	36(29.8)
(B)Time Spent Walking Or Pedaling In A Typical Day N (%)	
29 Minutes & Below	15(12.4)
30 Minutes & Above	70(57.9)
Not Applicable	36(29.8)
Vigorous Activities Causing Large Increase In Breathing Or Heart Rate N(%)	
Yes	55(45.5)
No	66(54.5)
If Yes, (A) Days Spent Doing Vigorous Activities N(%)	
1 Day	5(4.1)
(2-3) Days	33(27.3)
4 Days & Above	17(14.0)
Not Applicable	66(54.5)
(B) Time Spent Doing Vigorous Activities N(%)	
29 Minutes & Below	14(11.6)
30 Minutes & Above	41(33.9)
Not Applicable	66(54.5)
Vigorous Activities Causing Small Increase In Breathing Or Heart Rate N(%)	
Yes	55(45.5)
No	66(54.5)
If Yes, (A) Days Spent Doing Vigorous Activities N(%)	
1 Day	11(9.1)
(2-3) Days	27(22.3)
4 Days & Above	17(14.0)
Not Applicable	66(54.5)
(B) Time Spent Doing Vigorous Activities N(%)	
29 Minutes & Below	15(12.4)
30 Minutes And Above	40(33.1)
Not Applicable	66(54.5)

Foods

Table 8: In our study, 64(52.9%) participants were found to consume fast foods & drinks and 57(47.1%) were found that they do not to consume fast foods & drinks. Also, 50(41.3%) were found not to eat red meat for even a single day, 64(52.9%) ate meat for (1-3) days and 7(5.8%) eat red meat for (4-9) days. Among those who eat red meat, 42(34.7%) have 1 serving a day and 29(24.0%) have 2 servings and above. Also, 62(51.2%) do not eat white meat, 58(47.9%) eat white meat for (1-3) days in a week while 1(0.8%) eat it for (4-7) days in a week. Among those who eat white meat, 39(32.2%) have 1 serving and 20(16.5%) have 2 servings & above on a typical day.

Table 8: Foods

Variables	Summary Measurement
Consume Fast Foods N(%)	
Yes	64(52.9)
No	57(47.1)
Days You Eat Red Meat N(%)	
Zero Days	50(41.3)
(1-3) Days	64(52.9)
(4-7) Days	7(5.8)
Number Of Servings Of Red Meat A Day N(%)	
Zero Servings	50(41.3)
1 Serving	42(34.7)
2 Servings & Above	29(24.0)
Days You Eat White Meat N(%)	
Zero Days	62(51.2)
(1-3) Days	58(47.9)
(4-7) Days	1(0.8)
Number Of Servings Of White Meat A Day N(%)	
Zero Servings	62(51.2)
1 Serving	39(32.2)
2 Servings & Above	20(16.5)

Alcohol Consumption

Table 9: In our study, 89(73.6%) participants were found not to take alcohol and 32(26.4%) were found to take alcohol. Among those who take alcohol, 19(15.7%) take it at least once in 2 days and 13(10.7%) do not.

Table 9: Alcohol consumption

Variables	Summary Measurement
Alcohol Intake N(%)	
Yes	32(26.4)
No	89(73.6)
If Yes, Alcohol Intake At Least Once In 2 Days N(%)	
Yes	19(15.7)
No	13(10.7)
Not Applicable	89(73.6)

Stress

Table 10: In our study, 52(43.0%) participants were found to have stress and 69(57.0%) were found to have no stress.

Table 10: Stress

Variables	Summary Measurement
STRESS N(%)	
Yes	52(43.0)
No	69(57.0)

Body Mass Index

Table 11: In our study, 2(1.7%), 41(33.9%), 46(38.0%), 24(19.8%), 7(5.8%) and 1(0.8%) participants had weight between (40-40), (50-59), (60-69), (70-79), (80-89) and (90-99) kgs respectively. Also 1(0.8%), 39(32.2%), 41(33.9%), 29(24.0%), 9(7.4%), 1(0.8%) and 1(0.8%) participants had a height in range of (1.40-1.49), (1.50-1.59), (1.60-1.69), (1.70-1.79), (1.80-1.89), (1.90-1.99) and (2.00-2.09) meters respectively. Also 10(8.3%) were under weight (BMI) < 18.5kg/m², 72(59.5%) had a normal body mass index i.e. BMI= (18.5-24.9) kg/m², 30(24.8%) were overweight and 9(7.4%) were obese.

Table 11: Body mass index

Variables	Summary Measurements
Weight (Kgs) N(%)	
40-49	2(1.7)
50-59	41(33.9)
60-69	46(38.0)
70-79	24(19.8)
80-89	7(5.8)
90-99	1(0.8)
Height (M) N(%)	
1.40-1.49	1(0.8)
1.50-1.59	39(32.2)
1.60-1.69	41(33.9)
1.70-1.79	29(24.0)
1.80-1.89	9(7.4)
1.90-1.99	1(0.8)
2.00-2.09	1(0.8)
Body Mass Index (Kg/M²)	
<18.5	10(8.3)
(18.5-24.9)	72(59.5)
(25.0-29.9)	30(24.8)
>30.0	9(7.4)

Ways to Prevent Prediabetes Among KIU Bachelor Students

Table 12: In our study, 17(14.0%) participants did not know or left it blank, while 104(86.0%) of the participants knew some ways of how to prevent prediabetes. Among those who knew, 40(33.1%) talked about physical activities, 35(28.9%) foods and diet, 7(5.8%) avoid smoking, 11(9.1%) avoid alcohol and 11(9.1%) avoid stress.

Table 12: Ways to prevent prediabetes among KIU bachelor students

Variables	Summary Measurements
Ways To Prevent Prediabetes N (%)	
Don't know/left blank	17(14.0)
Physical activity	40(33.1)
Diet/food	35(28.9)
Avoid smoking	7(5.8)
Avoid alcohol	11(9.1)
Avoid stress	11(9.1)

DISCUSSION

Prevalence of prediabetes among KIU-WC bachelor students

In this study, the prevalence of prediabetes was 19.8% which is higher than the 8.6% reported in rural Eastern Uganda [9] and 13.8% reported by Chiwanga et al. [19]. This provides evidence that the prevalence of prediabetes is increasing worldwide and its projected that >470 million people will have prediabetes in 2030. This also confirms findings of Aldossani et al. [20] that prediabetes was more prevalent in middle aged (25-45 age group) given our study population age range. The reason for this high prevalence may be due to a sedentary lifestyle lived by most of the university students and the moderate awareness of the risk factors can also be related to the fact that KIU-WC has largely medical students who study diabetes as a topic in their curriculum. We observed that prediabetes was prevalent among middle aged, e.g. (15-35) years of age as per our study population age range. This is in relation with the latest estimates from the International Diabetes Federation (IDF) [21], which stated that 352 million adults between the ages of 20 and 75 years (7.3% of that population) could be classified as having prediabetes.

Risk factors associated with the development of prediabetes

Family history, physical inactivity, diet (consuming fast foods), alcohol consumption, stress and body mass index are the factors that were found to have some significant association with the development of prediabetes among KIU-WC bachelor students than hypertension, gestational diabetes and cigarette smoking. The reason being that these students are associated with a sedentary lifestyle characterized of physical inactivity, fast food consumption, alcohol intake, stress with cigarette smoking being exclusive. These factors could escalate the risk of diabetes and other non-communicable diseases [22, 23]. We noted that among KIU-WC bachelor students, a large number were non-hypertensive, did not smoke cigarettes and most female students were unmarried or had never been pregnant thus zero reports of gestational diabetes.

Ways to prevent prediabetes

In our study, the participants were suggestive of physical activity (33.1%), change in diet (28.9%), ceasing of cigarette smoking (5.8%), ceasing alcohol intake (11.9%) and avoiding stress (11.9%) as ways to prevent prediabetes. Thus, this implies that lifestyle modification is the cornerstone for the prevention of prediabetes. This is similar to the conclusion made by Glechner et al. [24] that lifestyle intervention involving the modification of dietary and physical exercise behaviour is an efficacious, safe and cost-effective measure for reducing

the risk of progression to T2DM in people diagnosed with prediabetes. Preventing dietary high cholesterol reduces the risk of hypertension and other cardiovascular diseases which can heighten the risk and severity of T2DM [25-28]. We noted that knowledge of these ways of prediabetes prevention is common among most university students except about 14.0% thus needing sensitization for effective prevention.

CONCLUSION

The prevalence of prediabetes among KIU-WC bachelor students was found to be 19.8% thus increasing as projected. Prediabetes is more prevalent among middle-aged or young adults (18-35) years. Lifestyle modification is the cornerstone in the prevention of prediabetes and/or delays its progression to T2DM in a given population. Relevant research studies on prediabetes among university students are scanty thus providing a need to conduct more across all given population studies in Uganda. Healthcare providers and policymakers need to collaborate and prioritize diabetes care to ensure that health care is easily accessible and affordable by all people in Uganda despite being a developing country with a low socio-economic status.

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CITE AS: **Kavubu Michael (2023). Incidence of Prediabetes and its Development Risk Factors among Bachelor Students at Kampala International University's Western Campus in Uganda. INOSR Experimental Sciences 12(2):119-131.** https://doi.org/10.59298/INOSRES/2023/2.9.1000