METABOLLIC SYNDROME COMPONENTS AS A RISK FACTOR TO THE HEALTH STATUS OF UNIVERSITY STUDENTS IN KENYA

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Abstract

An efficient healthcare system targets the maintenance or improving the health position for citizens that can be achieved through disease and illness prevention based on curative and preventive care. Kenya currently experiences a change in its diseases burden from infectious to non-communicable diseases. This has been fueled by adoption of unhealthy lifestyles and other health risk factors such as metabolic syndrome components (MSCs) whose magnitude and impact especially among young generations has not been documented appropriately. The drive of the research was to investigate the (MSCs) as a risk factor to the health status of University students in Kenya. A cross sectional study involving 430 students from Maseno University, Kenya and anthropometric measurements based on World Health Organization (WHO) and American Heart Association were adopted. Results indicated a high prevalence of ill health at 52.6% for a period of up to 3 months among the University students. The study concluded that prevalence of ill health among University students may be majorly attributed to the abnormality in the MSCs of waist circumference, blood sugar and HDL-C. The study therefore recommends appropriate measures need to be undertaken by Kenyan Universities including the adoption of health education as part of the curriculum to sensitize students on the significance of embracing healthy lifestyles as a preventive measure against ill health.

Keyword: Health status, metabolic syndrome (MS) components

1.INTRODUCTION

Ill health remains a major source of poverty making quality healthcare provision as one of the priorities of many governments [10]. An efficient healthcare system targets the maintenance or improving the health position for citizens that can be achieved through disease and illness prevention based on curative and preventive care [3]. Developing nations currently face a change in disease category and occurrence due to increased growth, change in technology, increased physical inactivity, smoking and change in eating habits. The factors poses a high risk for contracting non-communicable diseases (NCDs) which account for more than 80 % of illness burden [13].

Kenya currently experiences a change in its diseases burden from infectious to non-communicable diseases causing social and economic consequences relating to health-care needs, reduced production and untimely death [12]. This has been fueled by adoption of unhealthy lifestyles and other health risk factors such as metabolic syndrome components (MSCs) whose magnitude and impact especially among young generations has not been documented appropriately [5]. Metabolic syndrome (MS) involves a combination of increased blood pressure, high cholesterol, abdominal obesity, dyslipidemia and diabetes with patients having abnormal MS components being two times likely to die from cardiovascular diseases, thrice as probable to have stroke, and five times probable of developing type 2 diabetes in comparison to those with normal

components [4]. The approximations of International Diabetes Federation (IDF) indicate that almost 25 % of adults on the planet have MS with its occurrence rising in majority of countries in relation to the world epidemics of obesity and diabetes [4]. Starting from infancy and all through life, persons can develop MS which may cause long-term health problems and therefore identifying and reducing risk factors is necessary [8].

The Kenyan government's determinations in dealing with difficulties encountered in the health sector remains biased towards the supply side whereby, for instance the commencement of devolved resources through Constituency Development Funds (CDFs) and County government's devolved funds has witnessed emergence of many health centers [10]. However, there has been little intervention to identify the major health risk factors that affect the health status imposing huge financial burden to the citizens. This identification is very necessary for appropriate preventive measures to be undertaken thus a justification for the study that highlights the scenario in the youthful Kenyan generation.

1.1. MS Diagnosis

The measures to detect this syndrome are by the occurrence of at least three of the components in Table 1 as explained by the American Heart Association (2015) and World Health Organization:

Table 1: MS risk factors

Risk Factor	Men	Women
Fasting glucose/Blood sugar	$\geq 100 mg/dL$	$\geq 100 mg/dL$
Central Obesity (waist circumference)	> 40 inches	> 35 inches
Low high-density lipoprotein cholesterol (HDL-C)	$< 40 mg/dL$	$< 50 mg/dL$
Fasting blood triglycerides	$\geq 150 mg/dL$	$\geq 150 mg/dL$
Blood pressure	$\geq 130/85 \text{ mm Hg}$	$\geq 130/85 \text{ mm Hg}$

1.2. Purpose

To investigate the metabolic syndrome components as a risk factor to the health status of University students in Kenya with specific objectives of determining the;
  i. Prevalence of ill health among University students in Kenya
  ii. Association between MS components and the health status of University students in Kenya

1.3. Scope of the Study

The research was conducted at Maseno University involving both undergraduate and post graduate students.

2. LITERATURE REVIEW

[7] investigated obesity a MS component to understand if it poses a risk for chronic health illnesses in Australia. They established that 7% the well-being challenges in Australia was attributed to obesity. Males encountered a higher health burden in relation to females. It was also established that 14 % of the sickness problem due to obesity could be controlled by 2020 if people at risk worked on reducing their weight.

[9] estimated the occurrence of obesity among adults aged between 18 years and above in USA. Results indicated that being obese increased the probability of one becoming diabetic, hypertensive, asthmatic, getting arthritis. This led to the conclusion that high waist circumference is among the key poor health status risk factors.

[5] explored the variables determining the health status for the residents of sixteen European nations. The isolated variables were obesity, alcohol drinking and smoking. The findings indicated that the three risk factors had a significant effect on the person's well being. Obesity had a significant negative effect on the individual's health status.

In comparing the magnitude of drinking, smoking and obesity on the well being of people, [14] findings indicated that being obese out ranked smoking and drinking in regard to affecting the health status of individuals. This was linked to a 36 % rise in inpatient and outpatient expenditure for those with obesity in comparison to a 21 % rise in inpatient and outpatient expenditure for smokers.

CDC (2012) evaluated the non-high-density lipoprotein cholesterol levels, smoking habits, blood pressure levels and aspirin as a risk for contracting cardiovascular diseases (CVDs). Focusing on 4,182 persons aged over 65 in the USA for a period of 9 years and 3 months, results disclosed that old men who did not regulate any of the risk variables quadrupled their risk of getting CVDs in comparison to those who regulated the factors. Persons on drugs to shrink non-HDL-C levels considerably diminished CVDs risk. Similarly, [11] in analyzing the lipoprotein levels among students at a higher risk for CVDs in comparison those not at risk for CVDs at the University of Novi Sad showed that the values of low HDL-c were greater in Group 1 in comparison to Group 2.

[6] tested the hypothesis that blood glucose levels are linked to higher occurrence of cardiovascular diseases. The study considered the MSCs of blood pressure, overweight, fasting blood glucose and lipoprotein cholesterol. Results indicated that the occurrence of CVDs was highly connected to overweight, abnormal cholesterol and triglycerides levels.

3. MATERIALS AND METHODS

The research adopted a cross sectional design involving 430 students from Maseno University, Kenya with anthropometric measurements of the MS components based on WHO and American Heart Association and in Table 1. Approval was obtained from Maseno University Ethical Review Committee (MUERC) and informed consent from the participants.

4. RESULTS AND DISCUSSION

4.1. Socio-demographics of Study Participants

Table 2 results indicated that majority of the participants were males at approximately 66 % and most of them at about 41% were in the age bracket of 18 to 20 years. This implied that most of the students at the University are teenagers who still depend on their parents or guardians to meet their school fees payments and other basic needs.

Table 2: Socio-demographic characteristics

		What is your gender?		Total
		Males	Females	
What is your age?	18-20	96	78	174 (40.5%)
	21-23	120	22	142 (33.0%)
	24-26	5	4	9 (2.1%)
	over 26	62	43	105 (24.4%)
Total (N=430)		283 (65.8%)	147 (34.2%)	430 (100.0%)

4.2. Prevalence of Ill -health

The first goal was to determine the prevalence of ill health among University students. Table 3 results indicated that 33.7% of the students were sick over 6 months followed by those who fell sick in less than a month at 30.5%. It was also noted that the least number of students at 13.7 % were sick between 4 to 6 months. Cumulatively, the prevalence of ill health was high at 52.6% for a period of up to 3 months. This implied that most students often fall sick which may be attributed to undisclosed underlying ill- health risk factors associated with student's lifestyle.

Table 3: When was the last time you fell sick?

Duration	Number of participants (n)	Percentage %
Less than a month	131	30.5%
1-3 months	95	22.1%
4-6 months	59	13.7%
Over 6 months	145	33.7%
Total (N)	430	

4.2. MS components and the health status of University students

The second goal was to determine the association between MS components and the health status of

University students in Kenya. Table 4 results indicated that out of the 430 sampled students, 425 (98.8%) had abnormal HDL-c level, 105 (24.4%) had abnormal high fasting glucose and 40 (9.3%) had abnormal waist circumference. It was noted that 226 (53.2%) of the students out of the 425 who had abnormal HDL-c level fell sick in the period of not more than three months. Out of the 105 students who had high fasting glucose level, 66 (62.9%) fell sick in the period of not more than three months and 32 (80%) out of the 40 students who had abnormal waist circumference fell sick in the period of not more than three months. Based on the chi-square analysis, Table 4 results indicated that there was an association between the waist circumference, abnormal levels of HDL-C, high blood sugar and when the student fell sick given p –values of less than 0.05 for all the components. This was similar to the findings of [6,9,11] who indicated obesity, HDL-C and high blood sugar to be health risk factors to individuals.

Regression analysis results in Table 5 indicated that HDL-C, high blood sugar and abnormal waist circumference had a significant positive relationship with when the student fell sick. This implied that an increased abnormality in the MS components increases the frequency of sickness among University students.

Table 4: Association between MS components and ill – health of students

When were you sick?	HDL-c (< 40 mg/dl)	High fasting glucose (> 100 mg/dl)	Waist circumference ($> 40 inches$ for men or $> 35 inches$) for women
≤ 3 months	226 (53.2%)	66 (62.9%)	32 (80.0%)
≥ 3 months	199 (46.8%)	39 (37.1%)	8 (20.0%)
Total	**425**	**105**	**40**
χ^2	9.943	10.138	31.061
P-values	0.007	0.006	0.000

Table 5: Regression analysis results

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	.679	.387		1.753	.080
high lipoprotein cholesterol levels (HDL-C)	.479	.209	.111	2.295	.022
high fasting glucose in mg/dl	.440	.154	.136	2.850	.005
waist circumference (obesity) in inches	.231	.078	.082	2.962	.002

5.CONCLUSION AND RECOMMENDATIONS

The study concluded that the prevalence of ill health among University students of 52.6% in not more than three months is high and is attributed to the abnormality in the MS components of high blood glucose, HDL-C and waist circumference given that there is a significant association between MS components and the health status of the students. This may be due to bad dietary habits and physical inactivity among the students. The study therefore recommends appropriate measures needed to be undertaken by Kenyan Universities including adoption of health education as part of the curriculum for sensitizing students on the significance of

embracing healthy lifestyles as a preventive measure against ill health and the risk of getting NCDs in the future.

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