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Knowledge of metabolic syndrome (MetS) and diabetes mellitus II (DM II) among undergraduate students: A crossectional study among University of Ghana students

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Abstract:

Background: *DM II and MetS are highly prevalent in the adult population worldwide. Education may play an important role in preventing DM II and MetS in young adults, especially those who are attending university. Such adults are at a critical point in their lives and make their own lifestyle choices that can affect their future health.*

Aim*:- The study was conducted to determine the knowledge of metabolic syndrome (MetS) and diabetes mellitus II (DM II) among undergraduate students of the University of Ghana.*

Method*:- In a crossectional study design, a pre-tested administered questionnaire was used as a survey instrument. One hundred respondents were selected by non-probability sampling method. The data was analyzed by Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Excel 2007.*

Results:-. Findings from this study revealed that about 69% of participants were aware of DM II while only 27% were aware of MetS. Only 10% of them had in-depth knowledge about DM II with 7% having knowledge of MetS. Although awareness level was high among the participants, myths and inaccurate information about DM II existed. 21% of the respondents reported family history of DM II even though only 2.9% said they discussed about DM II and MetS at home with their parents. Majority of the respondents obtained their awareness through television with only 14.5% obtaining their awareness through the internet. Majority of the respondents could not identify the components of MetS as well as the signs and symptoms of DM II.

Conclusion*: Awareness of DM II was generally high but with marked misconceptions and the quality of the knowledge about DM II was poor; as the students could not identify the causes of DM II as well as measures to prevent the disease. Also, there was little awareness as well as in-depth knowledge about MetS among the respondents. Education on these lifestyle conditions are necessary in other to maintain a healthy population. There is also the need for the formation of health clubs in Ghanaian Universities to help disseminate health information to students.*

Introduction

Diabetes is becoming a national and global epidemic and type II diabetes (DM II) is considered one of the most rapidly increasing chronic diseases in the world (1). Diabetes directly affects 7.8% of the population of the United States, roughly 23.6 million people, children and adults (2). There are 17 million people diagnosed with diabetes and 5 million who are not diagnosed but still manifesting characteristics of the disease (3). Additionally 1.6 million new cases are reported each year from individuals who are 20 years old or older (3). Approximately 75–80% of people with diabetes die of cardiovascular disease (4).

The prevalence of non-communicable diseases such as DM II and MetS are escalating rapidly around the globe due to the increasing rates of urbanization and changing lifestyles (5). According to World Health Organisation estimates, by the year 2020, these diseases will account for approximately three quarters of all deaths in the developing world (6). The fight against chronic diseases in adulthood can only be won if the risk factors for such diseases are eliminated in children and young adults (7-10). An emerging public health issue for all nations is the increasing burden of obesity in adolescents and young adults that lead to new cases of MetS among young people, which in turn increases the prevalence of non communicable diseases and puts enormous socioeconomic burden on families and the public health institutions of nations (11).

Good knowledge of the risks of diabetes type II and MetS as well as taking precautions against it are of vital importance to raise healthy generations (12, 13). University students are supposed to be very

enlightened on health issues (14-16) so that they can help to educate communities. For this reason, it is important that an assessment of the knowledge that undergraduate students possess so as to help design programs to correct their myths and misconceptions on these non communicable diseases.

Objective of the study

The study was conducted to determine the knowledge of metabolic syndrome and diabetes mellitus II among undergraduate students in the University of Ghana.

Methods

Study design

The study was a descriptive cross-sectional survey of the knowledge of the risks of MetS and DM II among undergraduate students. It is descriptive because a quantitative analysis was used to analyze the results elicited by the questionnaires. It is non experimental as the study was conducted in the natural setting of the participants without any controls.

Population and sample

The participants were undergraduate students in the five traditional halls of the University of Ghana. The target population consisted of University of Ghana undergraduate students, both males and females, from the five (5) traditional halls of the university, namely; Akuafo, Commonwealth, Mensah Sarbah, Legon and Volta halls. These groups comprised all undergraduate levels; level 100 to 400.

Sample and Sampling Techniques

In this study, the purposive sampling method was used which, according to Silverman (2005:129) as cited in [6], allows a researcher to choose a case because it offers an explanation to a feature or a process that she or he is interested in. Sample size used was 100 which were derived using Krejcie, R.V. & Morgan, D.W. (1970) as cited [2,4].

The formula for determining the sampling size was:

$S=X^2 NP (1-P) +d^2 (N-1) + X^2 p (1-p)$.

S =required sample size,

X^2 =table value of chi-square for 1 degree of freedom at the desired confidence level (3.841),

N =Population size,

P =population proportion (assumed to be .50 since this would provide the maximum sample size),

d =the degree of accuracy expressed as a proportion (.05).

It has been estimated that about 41,596 undergraduate students. A sample size of one hundred (100) was chosen for the study.

Data collection methods

The data was obtained from the respondents through the administration of questionnaires during field work. The respondents' were contacted in their various halls after obtaining institutional approval from the Dean of students and from the hall masters of the various halls. Informed consent forms were given to participants to obtain permission to enroll them unto the study. This was after the entire rationale for the study as well as the risk and benefits had been explained and all questions answered. Each participant was given a photocopy of the informed consent form while the original was kept by the researchers. Participants were told that participation in the study was voluntary and also they were not to provide any form of identification on the questionnaire so as to maintain confidentiality. Questionnaires were administered to the respondents' and ample time given for them to answer the questions on the questionnaire. Those who could not comprehend or read English well any question had the questions interpreted to them. A maximum of thirty days was used to collect the data.

Data processing and analysis

Data collected was entered into Microsoft Excel 2007 spread sheet and imported to SPSS (Statistical Package for Social Sciences) version 20 for analysis. Results were presented with simple statistical tools.

Pretesting

Twenty five (25) questionnaires were pre tested on undergraduate students in Dr. Hilla Liman hall to ensure reliability and validity of the data gathering tool. The necessary redesigning of questions and deletion of irrelevant questions was made before the final administration of the questionnaires to respondents.

Ethical considerations

A letter of introduction was taken from the School of Nursing to the various hall masters to obtain institutional approval. Approval was granted, which enabled the researchers to carry out the study in all selected halls. Prior to administering the questionnaire, the purpose of the study was explained to participants while ensuring confidentiality. Informed consent was obtained from the participants. Respondents were told that participation was voluntary and that at any point of the study, they could opt out or continue in the study if deemed necessary. Participants were told that there was no need for personal identification.

RESULTS

Demographic characteristics of respondents

A total of 100 undergraduate students consisting of 53% males and 47% females were studied. There was significant difference between the ages of the participants based on gender as the male students reported higher ages compared to the female students. Compared to the female participants, the male participants had higher current and former smoking and alcohol use. 12% of the female respondents reported of family history of DM II as compared to the 9% of males (Table 1).

Awareness of DM II and MetS

Majority (69%) of the respondents claimed to be aware of DM II with only 31% claiming not be aware. On the source of awareness by the 69 % of the respondents, 17.4% claim they got the awareness from classroom teachings, 2.9% claim they got the awareness from their parents, 7.2% said they were made aware by their peers, 55.1% said the television and radio was the source of awareness 2.9% said they were made aware during religious gatherings and 14.5% cited the internet and other sources (print media) as their source of awareness. On the usefulness of the information, 69% said the information on DM II and MetS was not useful to them with only 31% claiming such information was useful. On the reasons why such information was not useful by the 69 %, the study revealed that 14.5% claimed the disease was a disease of old age and they were not old hence did not need such information, majority of the respondents (56.4%) considered the information as lacking in-depth information and hence no need for it, 25.5% of the respondents claim it was a disease meant for the rich and does did not involve them as students (Table 2).

Knowledge of respondents on DM 11

Majority (90%) of the respondents said they did not have in-depth knowledge about DM II with only 10% reporting to have knowledge on DM II. Only 32% of the respondents viewed DM II knowledge as important for university students with majority (68%) claiming that knowledge on DM II for university students was not important. On the question of the respondents knowledge about the signs and symptoms of DM II: Only 14 % identified polyuria, 5% identified polydipsia, 27% identified polyphagia, 16% identified weight loss, 14% identified nocturia and a majority of 76% identified hypergleacemia as a sign and symptom of DM II. The results further revealed that only 24% of the respondents identified the pancreas as the organ damaged in DM II. Majority of the respondents were able to identify fertility issues and cardiovascular complications as associated with DM II (Table 3).

Knowledge of respondents on MetS risk

Majority (93%) of the respondents said they did not have in-depth knowledge about MetS with only 7% reporting to have knowledge on MetS. Only 40% of the respondents viewed MetS knowledge as important for university students with majority (60%) claiming that knowledge on MetS for university students was not important. On the question of the respondents knowledge about the components of MetS: Only 9 % identified hypertension, 14% identified high LDL, 30% identified abdominal obesity, 10% identified low HDL, 22% identified high TG and of 11% identified hypergleacemia. The results further revealed that 14% claimed MetS could be prevented through regular exercises, 30% said eating vegetables and fruits could prevent MetS, 45% said MetS could be prevented through eating less fatty meals, 21% said reducing excessive snacking could prevent MetS, 41% said stopping late eating could prevent MetS and only 18% identified reduction in alcohol intake as preventing MetS. Also, 52% of the respondents believed weight reduction could help to prevent MetS (Table 4).

Discussion

The study was conducted to assess the knowledge on diabetes mellitus type II and MetS among undergraduate students of the University of Ghana. A sample size of one hundred (100) students was used to gather data after which the results were analyzed. The results revealed that male undergraduate students were significantly older as compared to female undergraduate students.

General and anthropometric characteristics of participants

The study revealed that 53% of the participants were males with 47% of the participants being females. The study results gave an indication that the use of alcohol and smoking which are risky health behaviours were still prevalent in the study participants and this is a source of great concern. 9 % of the male participants currently smoke as compared to 3% of the females. Furthermore, 12% of the male participants said they had smoked before as compared to the 6% of the female participants. The male participants had higher current alcohol intake compared to their female counterparts (29% v 14%) as well as former alcohol use. This high alcohol intake could predispose these students to non communicable diseases (NCDs) in the not too distant future. This conclusion is based on the findings of (16-19) who stated that excess alcohol consumption is associated with a high prevalence of MetS but this is contrary to a study (20) which showed an increasing dose-response relationship between alcohol consumption and MetS. The record of alcohol intake and cigarette smoking among the participants is a source of worry, because majority of the participants are at the peak of their reproductive years and considering the impact of alcohol use and cigarette smoking on general health as well as on the participants' reproductive life (21).

Awareness versus knowledge Level of respondents on DM II and MetS

Responses by respondents in this study regarding DM II and MetS awareness and knowledge, suggests that most of the respondents (69%) were aware of DM II but only 27% claimed to be aware of MetS. Despite the somewhat high awareness of DM II, only 10% claimed to have knowledge about DM II with just 7% claiming to have knowledge on MetS. This in contrast with [21] who revealed in their study that

two-third of their total number of 316 adolescent respondents had adequate knowledge about DM II and MetS. Our results is also in contrast to what was [22] found in their study where they indicated that 87.7% females and 82% males in their study had sufficient knowledge about DM II. However, our finding is in line with findings by [23], who revealed that DM II and MetS was very low among adolescents in their study.

On the sources of awareness, our study revealed that 7.2% of the respondents had their awareness and knowledge from their peers. Only 2.9% said they obtained their information from their parents and from religious organizations. This clearly indicates that parents are not giving out adequate health information to their wards. 14.5% of the respondents claim their knowledge was from the internet. Also, television and radio were sources from which some of the respondents received information about DM II and MetS. These findings are in line with what was revealed by [24] where radio (50.4%), social events (29.2%), and television (28.2%) were the most occurring sources where participants received information about NCDs.

Majority of the respondents could not identify the components of MetS and the preventive strategies for it. This is definitely will make it difficult for them to be able to initiate measures to prevent it. Also, the respondents had difficulty identifying the signs and symptoms of DM II even though majority identified hyperglyceamia as a cardinal sign. Majority of the respondents could not also identify the preventive mechanisms of DM II. This is worrying because these are university students who should have been well informed on health issues but the contrary exist.

Conclusion

Undergraduate students have insufficient knowledge about DM II and MetS as well as do not understand the preventive mechanisms that can be adopted to overcome these two related NCDs. This is a source of concern since it will hinder measures aimed at reducing the burden of these debilitating illnesses in the Ghanaian population.

Recommendations

Considering the high rate of NCDs among Ghanaians, we recommend that;

1. Intense public education on DM II and MetS for Ghanaians is essential if the health of the nation is to improve on the health of the populace.
2. Health clubs should be established in the various halls so that students will always be informed of current trends in NCDs.
3. Policy makers in the educational sector, parents and other members within the health sector should take the issue of NCDs seriously by providing in-depth information.

1. List of abbreviations

DHDL	Decrease High Density Lipoprotein
DM II	Diabetes mellitus type II
etc	etcetera
FBG	Fasting Blood Glucose
HDL cholesterol	High density lipoprotein
IR	Insulin resistance
LDL cholesterol	Low density Lipoprotein
MetS	metabolic syndrome
NCDs	Non Communicable Diseases
NIDDM mellitus	Noninsulin dependent diabetes
SD	Standard Deviation
SPSS Sciences	Statistical Package for Social
TC	Total Cholesterol
TG	Triglyceride
VLDL	Very low density lipoprotein
v	Versus
WHO	World Health Organization

DECLARATIONS

Ethics approval and consent to participate

The study was conducted in conformity with the Helsinki Declaration on Human Experimentation, 1964 with subsequent revisions, latest Seoul, October 2008 (15). A letter of introduction was taken from the School of Nursing to the various hall masters to obtain institutional approval. Approval was granted, which enabled the researchers to carry out the study in all selected halls. Prior to administering the questionnaire, the purpose of the study was explained to participants while ensuring confidentiality. Informed consent was obtained from the participants. Respondents were told that participation was voluntary and that at any point of the study, they could opt out or continue in the study if deemed necessary. Participants were told that there was no need for personal identification.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated during and/or analyzed during the current study are not publicly available because some aspects of the data is still being processed for subsequent manuscripts but are available from the corresponding author on reasonable request and subject to the approval of the other authors.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

All authors contributed to conception, design, acquisition of data, analysis and interpretation of

data, and involved in drafting the manuscript or revising. Also all authors read and approved this manuscript for publication. KKD: drafting of proposal, collection of data, presentation of findings and drafting and review of manuscript. KMS: drafting of proposal, editing and supervising of data and reviewing of manuscript. KAK: drafting of proposal, collection of data, presentation of findings and drafting and review of manuscript. PAY: drafting of proposal, collection of data, presentation of findings and drafting and review of manuscript. KKD: drafting of proposal, collection of data, presentation of findings and drafting and review of manuscript.

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