Original Article
Ethiopian university students' knowledge and perception towards cardiovascular disease risk factors: a cross sectional study

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Abstract: Cardiovascular disease (CVD) is the commonest cause of morbidity and mortality with an estimation of 17.9 million deaths worldwide annually. Knowledge about the disease and risk factors changes individuals' health attitudes, behaviors and lifestyle practices. We assessed the knowledge and perception of University students towards CVD risk factors. A cross-sectional survey was done on undergraduate students at University of Gondar, Ethiopia. We stratified sampled students based on their colleges and then used convenience sampling technique to pick up study participants from each college. Data was analyzed using SPSS version 20.0. Descriptive statistics were used to describe frequencies, percentages, mean and standard deviations of variables. Presence of association between independent and dependent variables was examined using logistic regression analysis. A P-value of < 0.05 was considered to be statistically significant. Four hundred twenty-three students with a mean age of 22.07 ± 2.17 participated. Majority of them were male 279 (66.0%). Nearly one third (32.2%) of study subjects had good knowledge on CVD risk factors. More than 75% of study participants disagreed with ideas relating them to susceptibility towards CVD. Students from the college of medicine and health sciences were 2.6 times more knowledgeable about CVD risk factors than students from other colleges (P = 0.024). Similarly, students from college of medicine and health sciences perceived 2.3 times more positive towards severity of CVD than students from other colleges (P = 0.027). Students at University of Gondar were poorly knowledgeable about CVD risk factors and they perceive that they are not at risk of CVD. Educational intervention is needed to improve their knowledge.

Keywords: Cardiovascular disease, student, knowledge, perception, University of Gondar

Introduction

Cardiovascular diseases (CVDs) are the number 1 cause of death globally. An estimated 17.9 million people died from CVDs in 2016, representing 31% of all global deaths. Of these deaths, 85% were due to stroke and heart attack. CVDs refers to a group of disorders of heart and blood vessels and includes coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism [1]. About 80% of the deaths from CVD occur among the low and middle-income earners in sub-Saharan Africa. Sub Saharan Africa is experiencing an epidemiological transition with a rapid increase in non-communicable diseases (NCDs) including CVDs, which adds burden to the already complex health situation [2-6].

Even though CVDs are common in the middle and older ages, lifestyle practice in the early stages of life and continued into the latter ages determines the risk of their occurrences [7]. Adherence to healthy and nutritional lifestyle recommendations are vital in the prevention of CVDs [8]. On the other hand, Knowledge about risk factors for CVDs is crucial to correct peoples' lifestyle, behavior and attitude [9, 10].

Most students are ignorant about healthy diet guidelines and consume diets high in fats, sugar and sodium with minimal intake of vege-

Table 1. Socio-demographic characteristics of participants in university of Gondar, Ethiopia, 2017 (N = 423)

Variables		Frequency (n)	Percentage (%)
College	College of medicine and health science (CMHS)	77	18.2%
	Colleges other than CMHS*	446	81.8%
Age	18-23 years	333	78.7%
	≥ 24 years	90	21.3%
Sex	Female	144	34.0%
	Male	279	66%
Year of study	Freshman Student (1st Year)	39	9.2%
	Senior student#	384	90.8%

Senior student# = students from second to 5th year. Colleges other than CMHS* = College of business and economics, college of agricultural and rural transformation, college of social science and humanities, college of natural and computational science, institute of technology, school of education, school of law.

tables and fruits [11]. University students involve in a variety of health risk behaviors such as drinking, smoking, unhealthy diets, sedentary lifestyles etc. These activities may cause CVDs to them as they age. Most of the risk factors known to cause heart diseases are related to lifestyle behaviors of college students which are preventable. A university setting provides a unique opportunity to reach many young adults through disseminating information about cardiovascular risk reduction [12].

Physical inactivity, tobacco use, obesity and an unhealthy diet are some of the modifiable risk factors which precede most of the CVDs. An effective control measure will decrease the development and progression of CVDs [13]. Knowledge about CVD risk factors can reduce overall cardiovascular risk of an individual. According to the health belief model (HBM), a person must feel susceptible to a disease to be motivated for a change in behavior [14]. Individuals should have the knowledge to have healthy lifestyle. The current study assessed the knowledge and perception towards CVDs risk factors among university students at University of Gondar, Ethiopia.

Methodology

Study area and period

The study was conducted from April 16 to May 15, 2017, at University of Gondar, the oldest medical school in Ethiopia established as the public health college in 1954. It is located in Gondar town, 730 Km away from the capital, Addis Ababa.

Study design and subjects

It was a cross-sectional study done on regular undergraduate students who were available during data collection period and willing to participate. Those students who had a diagnosis of CVDs such as myocardial infarction, congestive heart failure, stroke and hypertension were excluded. We stratified a calculated sample size (423) based on their colleges and then used convenience sampling technique to pick up study participants.

Data collection method and instrument

Three graduating class pharmacy students collected the data. They explained the objective of the study and took oral consent before actual data collection. Willing students were given a questionnaire (self-administered). The questionnaire contained three main sections; socio-demographic information, questions intended to assess knowledge about CVD risk factors and questions intended to unveil perception of students towards CVD risk factor. The questionnaire used to measure students' knowledge and perception was obtained from previous study [15]. The questionnaire was pretested among 40 randomly selected students for reliability. Language problems were not encountered.

Questions which measured knowledge had three possible answers (yes, no, I don't know). Each wrong or "I don't know" responses were given 0 point and each correct responses were given 1 point. Questions related to perception of students were rated on four points likert

Table 2. Results of students' knowledge assessment towards cardiovascular risk factors at University of Gondar, Ethiopia, 2017 (N = 423)

Items used to assess knowledge towards cardiovascular disease	Correct responses	Correct N (%)	Incorrect N (%)
People can easily know by themselves when they have heart disease	F*	45 (10.6%)	378 (89.4%)
If you have a family history of heart disease you are at risk for developing heart disease	T#	120 (28.4%)	303 (71.6%)
The older a person is, the greater their risk of having heart disease	T	308 (72.8%)	115 (27.2)
Smoking is a risk factor for heart disease	T	375 (88.7%)	48 (11.3)
A person who stops smoking will lower their risk of developing heart disease	T	300 (70.9%)	123 (29.1)
High blood pressure is a risk factor for heart disease	T	320 (75.7%)	103 (24.3)
Keeping blood pressure under control will reduce a person's risk for developing heart disease	T	306 (72.3%)	117 (27.7)
High cholesterol is a risk factor for developing heart disease	T	329 (77.8%)	94 (22.2)
Eating fatty foods does not affect blood cholesterol levels	F	354 (83.7%)	69 (16.3)
If your 'good' cholesterol (HDL) is high you are at risk for heart disease	F	226 (53.4%)	197 (46.6)
If your 'bad' cholesterol (LDL) is high you are at risk for heart disease	T	266 (62.9%)	157 (37.1)
Being overweight increases a person's risk for heart disease	T	292 (69%)	131 (31)
Regular physical activity will lower a person's chance of getting heart disease	T	378 (89.4%)	45 (10.6)
Only exercising at a gym in an exercise class will help lower a person's chance of developing heart disease	F	127 (30%)	296 (70)
Walking and gardening are considered exercise that will help lower a person's chance of developing heart disease	T	296 (70%)	127 (30)
Diabetes is a risk factor for developing heart disease	T	259 (61.2%)	164 (38.8)

F* = false, T# = True.

scale (strongly disagree, disagree, agree and strongly agree). (the questionnaire is available on request to the corresponding author).

Data quality assurance

The completeness, accuracy, and consistency of data were checked each day and it was entered twice to avoid error. The questionnaire was first translated to Amharic and then back to English to assure its consistency. Both the Amharic and English versions of the questionnaire were utilized as per participants' choice. SPSS version 20 software was used for data entry and analyses.

Data analysis

Descriptive statistics were used to describe variables in terms of frequency and percentage. A binary logistic regression model was used to determine the presence of an association between the dependent variables and independent variables. Study subjects who scored 70% and above for the knowledge section were labeled to have "good knowledge" and those who scored less than 70% were labeled to have "unsatisfactory (poor knowledge)". This classification is based on previously published research works [16, 17]. Variables with a p-value greater than 0.3 during uni variate binary

logistic regression were not included in the multivariate binary logistic regression model and only adjusted odds ratio was finally reported. A p-value less than 0.05 was considered statistically significant.

Results

Socio-demographic characteristics of the participants

A total of 423 students participated in this survey. The mean age was 22.07 (SD ± 2.17) years and more than three-fourths (78.7%) of them were under 24. Two-third of the participants (66%, n = 279) were male and nearly one-tenth of study participants (9.2%) were year I students. Most of the study participants (81.8%) were not from College of Medicine and Health Science (CMHS) (**Table 1**).

Knowledge of participants about cardiovascular disease risk factors

Knowledge score of participants' ranged from 1 to 15 with a mean result of 10.17 (SD ± 2.66). Some of the preventable Cardiovascular Disease Risk Factors (CVDRFs) are known by most of study subjects. For example, questions for which more than 80% of participants provided correct answer includes: "Regular physical ac-

Table 3. Factors affecting the knowledge of students towards CVD risk factors at University of Gondar, Ethiopia, 2017 (N = 423)

Demographic variable		Overall knowledge		AOR (95% CI)	p-value
		Poor n (%)	Good n (%)		
Gender	Female	90 (62.5%)	54 (37.5%)	1.310 (.808-2.125)	0.274
	Male	197 (70.6%)	82 (29.4%)		
Year of study	Freshman	30 (76.9%)	11 (23.1%)	0.507 (.227-1.131)	0.97
	Senior	257 (66.9%)	127 (33.1%)		
Departments	CMHS	39 (50.6%)	38 (49.4%)	2.620 (1.516-4.527)	0.024
	Outside of CMHS	248 (71.7%)	98 (28.3%)		

Table 4. Students' perception towards CVD risk factors at University of Gondar, Ethiopia, 2017 (N = 423)

	HBCVD questionnaire or items	SD	D	A	SA
Questions related to perceived susceptibility	It is likely that I will suffer from a heart attack or stroke in the future	106 (25.1%)	215 (50.8%)	95 (22.5%)	7 (1.7%)
	My chances of suffering from a heart attack/stroke in the next few years are great	163 (38.5%)	219 (51.8%)	27 (6.4%)	14 (3.3%)
	I feel I will have a heart attack or stroke sometime during my life	137 (32.4%)	208 (49.2%)	56 (13.2%)	22 (5.2%)
	Having a heart attack or stroke is currently a possibility for me	161 (38.1%)	177 (41.8%)	65 (5.4)	20 (4.7%)
	I am concerned about the likelihood of having a heart Attack/stroke in the near future.	214 (50.6%)	136 (32.2%)	54 (12.8)	19 (4.5%)
Questions related to perceived severity	Having a heart attack or stroke is always fatal.	38 (9.0%)	53 (12.5%)	234 (55.3%)	98 (23.2%)
	Having a heart attack or stroke will threaten my relationship with my significant other	87 (20.6%)	161 (38.1%)	121 (28.6%)	54 (12.8%)
	My whole life would change if I had a heart attack or stroke.	88 (20.8%)	182 (43.0%)	114 (27.0%)	39 (9.2%)
	Having a heart attack or stroke would have a very bad effect on my sex life	52 (12.3%)	90 (21.3%)	194 (45.9%)	87 (20.6%)
	If I have a heart attack or stroke, I will die within 10 years.	107 (25.3%)	185 (43.7%)	97 (22.9%)	34 (8.0%)

tivity will lower a person's chance of getting heart disease" (378, 89.4%), "Smoking is a risk factor for heart disease" (375, 88.7%), and "Eating fatty foods does not affect blood cholesterol levels" (354, 83.7%). However, most of the study participants (70%) failed to know that exercising at a gym during an exercise class is only one of the exercises to reduce the risk of CVDs.

Generally, 32.2% (n = 136) of the participants had good knowledge as they scored more than or equal to 70% for knowledge questions (**Table 2**).

College of study was significantly associated with knowledge. Accordingly, participants from CMHS were 2.6 times more knowledgeable than participants from colleges other than CMHS (P = 0.024) (**Table 3**).

Perception of participants towards cardiovascular disease risk factors

More than three-fourths (78.5%) of participants agreed that having a heart attack or stroke is

fatal. Similarly, 66.4% of participants thought that having a heart attack or stroke would have negative effect on their sex life. However, a significant proportion of study participants disagreed with the remaining perceived severity Health Belief Related to Cardiovascular Diseases (HBCVD) questions.

Similarly, most of the study participants (> 75%) didn't agree with the perceived susceptibility section of HBCVD questions. Accordingly, 90.3% of participants disagreed with the idea that their chance of suffering from a heart attack or stroke in the next few years is great. In addition, 350 (82.7%) of study participants were not concerned about the likelihood of having a heart attack or stroke. Similarly, nearly equal percentage of students didn't feel that they will have a heart attack or stroke sometimes during their life (**Table 4**).

No demographic variable was significantly associated with overall perception towards CVD-RFs. However, when the perceived severity sub scale (Question number 6-10) of perception

Table 5. Factors associated with the perceived severity of cardiovascular risk factors of students at university of Gondar, Ethiopia, 2017 (N = 423)

Demographic variable		Overall perception		AOR	P Value
		Negative	Positive		
Gender	Female	63 (43.8%)	81 (56.2%)	0.633 (.369-1.086)	0.097
	Male	101 (36.2%)	178 (63.8%)	1.00	
College	CMHS	28 (36.4%)	49 (63.6%)	2.344 (1.103-4.981)	0.027
	Colleges other than CMHS	136 (39.3%)	210 (60.7%)	1.00	
Year of study	1st year	14 (35.9%)	25 (64.1%)	1.598 (.633-4.033)	0.321
	Senior	150 (39.1%)	234 (60.9%)	1.00	

measure was computed as a dependent variable, college of study was associated significantly. Accordingly, participants from CMHS perceived 2.34 times more positive than participants from other colleges (**Table 5**).

Discussion

Most of the CVDRFs are reversible. Therefore, teaching population at risk can reduce the disease burden genuinely. University students involve in a variety of health risk behaviors [12]. Studying their knowledge and perception towards CVDs will help to design intervention measures. We explored undergraduate students' knowledge and perception towards CVDRFs at University of Gondar, Ethiopia.

In this study, 32.2% of participants had good knowledge (scored 70% and above). On the other hand, 61.2% of study participants had positive overall perception towards CVDRFs. In other words, even though the knowledge level of nearly two-thirds of study participants was unsatisfactory, their attitude towards CVDRFs was positive.

In this study, a relatively lower mean score was documented for questions related to heart disease (10.9) compared to the one reported from America which was 13.9 [18]. This difference in mean score may be due to differences in field of study among study participants'. The latter studied students who were doing mainly health science education specialty. Health science students are expected to have better knowledge level as they are provided with formal education during their university stay compared to other students from non health departments. However, more than 80% of our participants were from colleges other than the college of medicine and health sciences.

Compared to the report from Nigeria which concluded "good knowledge" only for 19.9% of participants (adult University workers) [17], the finding of the current study is by far greater. The smaller sample size the former research used and differences in sociodemographic status among study subject might explain the observed difference in knowledge level. However, the same study reported relatively good knowledge for some of the risk factors of heart disease including cigarette smoking and the importance of keeping controlled BP which is supported by the current study.

The most frequent risk factors identified by more than 80% of current study participants (smoking, eating fatty foods and physical inactivity) were also reported from Kuwait [19]. Even though the Kuwaiti research was done on adult Kuwaitis which excluded students, such risky lifestyles were also known well by current study subjects.

Only 75.7% of the current study participants knew that hypertension is a risk factor for heart disease and 72.3% of study participants know that controlling BP will lower one's risk of heart disease. However, these figures are relatively lower compared to a study results from turkey which reported 94.5% of participants knew that HTN is a risk factor for heart disease and 87.3% of participants knew that controlling BP will lower risk of heart disease [20]. This difference can be due to the fact that the latter study participants were only from nursing department. Students from the health-related field of study are expected to have better knowledge as they are provided with formal learning opportunities about commonly encountered diseases and their management.

From this survey we also noted that even though majority of participants (89.4%) are

aware that regular physical activity will lower a person's chance of getting heart disease, most of them (70%) also thought that only exercising at a gym in an exercise class will help lower a person's chance of developing heart disease. It seems that most of the current study participants were not aware that 'gardening' or 'walking' are exercises enough to reduce one's risk of acquiring heart disease.

Binary logistic regression analysis showed that college of study had a significant association (P = 0.024). Accordingly, students from CMHS were 2.6 times more knowledgeable about CVDRFs than those who were from other colleges.

This is an indication that if populations at risk are provided learning opportunities about health in general and CVDRFs in particular, their knowledge level can be improved. Students from other colleges should be provided with educational strategies to improve their knowledge.

Other research reported from Turkey with the intention to evaluate the level of knowledge about CVDRFS among college students indicated that senior students had higher knowledge compared to first-year students [21]. However, we noted from the current study that year of study had no significant association with level of knowledge. This discrepancy might probably be due to the fact that more than 80% of the current study participants were not from CMHS. Since most of the participants were not getting any opportunity of learning about CVD, their year of study per se may not bring changes in knowledge level.

The perception of most study participants towards susceptibility subsection of HBCVD questions was negative. A similar result has been reported from United States where most participants disagreed with the five perception questions intended to assess susceptibility [18]. It is expected from such a young population who had no experience with the disease and who perform poorly on knowledge questions to think that they are not susceptible.

College of study was significantly associated with perceived severity subsection of HBCVD questions. Accordingly, students from CMHS perceived 2.3 times more positive than those from other colleges. Even though most of par-

ticipants didn't think that they are at risk, their perception with regard to the consequences of contracting cardiovascular diseases is positive.

Limitation

The study design was cross-sectional and participants were selected conveniently. This limits the generalizability of the report. In addition, the result is based on students' self-report. Therefore, there was no way to verify the information provided reflects their actual stand.

Conclusion

Study participants were less knowledgeable and had a negative perception towards susceptibility to cardiovascular diseases. Educational intervention on the CVDRFs and their harmful effects is necessary.

Disclosure of conflict of interest

None.

Abbreviations

CVDs, Cardiovascular Diseases; HBM, Health Belief Model; HBCVD, Health Belief Related to Cardiovascular Disease; HDL, High Density Lipoprotein; LDL, Low Density Lipoprotein; AOR, Adjusted Odds Ratio; CVDRFs, Cardiovascular Disease Risk Factors; HDFQs, Heart Disease Fact Questionnaire; HTN, Hypertension; BP, Blood Pressure; CMHS, College of Medicine and Health Science.

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