ORIGINAL ARTICLE

KNOWLEDGE AWARENESS AND BEHAVIOUR OF NON-MEDICAL STUDENTS ABOUT CARDIOVASCULAR DISEASES

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Background: Cardiovascular diseases is the leading cause of death worldwide, yet very little data is available assessing the awareness of the younger population of Pakistan. The purpose of this study was to evaluate the awareness, knowledge and the preventive measures taken to avoid the health issues related to cardiovascular diseases. **Methods:** It was a community based cross sectional descriptive study to assess the awareness and behavior in young non medical students. A questionnaire was developed and survey was conducted on 300 non medical students enrolled in different universities of Pakistan. Data analysis was performed using SPSS-16. **Results:** The sample consisted of 300 students aged between 16 and 32 years.6.7% of the participants had history of blood pressure, 0.7% had diabetes, and 68.3% had a family history of cardiovascular diseases. 17.4% students were smokers. In the knowledge section, only 22% respondent scored above 20 out of 28 showing lack of knowledge. 42.7% participants were concerned about developing coronary artery diseases. 43.3% and 6.7% knew their blood pressure and cholesterol level respectively.33.3% and 41.7% regulate their dietary fat and salt intake respectively. **Conclusion:** Our study elucidates that cardiovascular diseases are not perceived as major risk by Non Medical Students. Lack of knowledge, physical inactivity, and high positive family history render the target population prone to cardiovascular diseases. The findings of study indicates the need for heart disease awareness campaigns for young population, to escalate the preventive actions and adoption of healthy lifestyles so as to lower the incidence of cardiovascular diseases in Pakistan.

Keywords: awareness, cardiovascular disease, knowledge, non medical students.

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INTRODUCTION

Cardiovascular diseases (CVD) are the leading cause of death in developing countries followed only by accidents and cancer in incidence and prevalence.[1] In Karachi, Pakistan the overall prevalence of CAD is 26.9%, and risk do not differ significantly by age group.[2] For both gender, the chief risks of developing CVD are same including smoking, caffeine overuse, heredity, stress, age, unhealthy lifestyle habits and inappropriate nutrition leading to obesity, diabetes, hypertension, hyperlipidemia.[3] However people are not fully aware of this as a study to assess knowledge level about CVD risk factors among cardiac patients conducted in Karachi stated that out of their 720 participants, only 143 (20%) participants correctly identified the relationship of all four modifiable risk factors (i.e., fatty food consumption, smoking, obesity & exercise) with heart disease.[4] Although CVD characteristically occurs in middle age or later, the changes are induced in the Cardiovascular System (CVS) since adolescence by adoption of sedentary life style in young age leading to hazardous impact in later years. Most students are ignorant about healthy diet guidelines and consume diets high in fats, sugar and sodium with minimal intake of vegetables and fruits.[5] Regarding this, a cross sectional study was done in Hyderabad between the ages of 14–18 years assessing the risk factor of CVDs in adolescence, which showed that unhealthy dietary habits were found in 31% of students while 29% of students didn't take part in any physical activity.[6] Awareness of the early warning signs of CVD is key to obviate sudden cardiac death.[7]

As people associated with medicine field adopt healthy lifestyle to a certain extent and there has been inadequate material about awareness of CVD in non-medical population of Pakistan, the aim of this study is to assess the level of knowledge, attitude and practices about CVD among non-medical students and preventive measures which should be taken. As studies have proved that mortality and morbidity rates due to CVDs can be prevented by both primary and secondary prevention, though for effective measures, they should be evidence based, approachable, designed for targeted population and culturally perceptive.[8]

MATERIAL AND METHODS

It was a community based cross sectional descriptive study conducted between August 2014 and January 2015. Data was collected from renowned non medical institutions in Karachi including Sir Syed University of Engineering and Technology, University of Karachi, NED University of Engineering and Technology and Usman Institute of Engineering and Technology. Sample size of 300 was calculated with Open Epi,

assuming 40% knowledge about cardiovascular diseases, a confidence level of 90% and keeping bound of error to be 5% we obtain sample size of approximately 300. Study participant were selected using convenient sampling. Those who gave informed consent were included in the study. Confidentiality, of the information was assured to them. The data collection tool (questionnaire) was developed to assess the knowledge awareness and behavior. Questionnaire was divided into three sections.

Section-1 included demographic characteristics and risk factors evaluation.

Section-2 included 28 questions out of which 22 questions were taken from Cardiovascular Disease Risk Factor knowledge Level Scale (CARRK-KL).[9] And 6 questions from heart disease knowledge questionnaire.[10] Respondents were graded according to the number of correct answers obtained and the score was divided into three components.

Section-3 included information regarding adoptive behavior of students for cardiovascular diseases prevention.

All the questions were presented in the form of statements and students were requested to mark true, false or don't know. Data was analyzed for frequencies and percentage using SPSS Version 16.0. The questions related to section-2 were tallied by correct response and totaled. The scores were recorded on Microsoft Office Excel spreadsheet. Total score was calculated by giving a value of 1 for each respondent's correct answer and adding the scores for all answers.

RESULTS

The sample consisted of 300 student participants with mean age 20.59 years. Eighty-four (28.0%) were from University of Karachi, 34 (11.3%) from NED University, 173 (57.7%) from Sir Syed University and 9 (3.0%) from Usman Institute of Technology. Out of these participants 173 (57.7%) were males and 127 (42.3%) were females. Fifty-three (17.7%) were married while the rest were single (82.3%). Majority participants belong to the Urdu speaking sect 228 (76.0%) while *Sindhi, Punjabi, Pushto, Balochi* and others were 26 (8.7%), 14 (4.7%), 11 (3.7%), 4 (1.3%) and 17 (5.7%) respectively. The socioeconomic status of 185 students (61.7%) was middle, 89 (29.7%) high and 26 (8.7%) was low. The risk factors along with the percentages are mentioned in table-1.

The respondent rate was 99.3%. The mean score was 17.01 with minimum score of 0 and maximum score of 25. The result according to score are mentioned in table-2. Majority of the students 197 (65.7%) correctly answered the question regarding the increase in cardiovascular diseases with age while 103 (34.33%) had no or false knowledge about it. Knowledge of students regarding basic risk factors for coronary artery diseases is given in the table-3.

Concerning the knowledge of symptoms of heart diseases 172 (57.3%) students were aware of the common symptoms of impending heart attack like chest pain, lightheadedness and weakness while only 54 (18%) stated incorrectly and 74 (24.7%) were unaware of these basic symptoms. Less than half of the students 130 (43.3%) answered the questions correctly of 'turning pale or grey' showing awareness of the association of paleness and discoloration with angina and myocardial infarction. Only 56 (18.7%) of the students correctly stated that there is no association between visual disturbances and symptoms of heart attack by marking the symptom of 'sudden trouble seeing in one eye' as false.

Further assessment of the knowledge of the incidence of the heart diseases among the students showed that two-fifths of the participants (40%) were appropriately aware that a person never timely realizes that he is having a heart attack by comprehending the symptoms leading to dire consequences while more than one fifth 31.3% falsely believed he did. One hundred and thirty-seven (45.7%) participants were full aware of the fact that the cardiovascular diseases can be prevented while only 23 (7.7%) thought that they were inevitable and 140 (46.7%) had no information regarding this.

Evaluating fundamental cholesterol information indicated that 92 (30.7%) thought HDL (good cholesterol) was a risk factor of coronary artery diseases and only 99 (33%) were well-informed that it wasn't a risk factor. One hundred and sixty-four (54.7%) were aware that bad cholesterol was a risk factor for coronary artery diseases while 43 (14.3%) thought it wasn't a risk factor.

Only 128 (42.66%) participants were concerned about developing coronary artery diseases in future. The reasons given by 172 (57.33%) non-concerned students and preventive measures adopted by concerned students with percentages are highlighted in table 4 & 5. One hundred and thirty (43.3%) reported to be aware of their personal blood pressure whereas 96 (32%) were uninformed of it and 74 (24.7%) never bothered to get it checked. Twenty (6.7%) were aware of their personal blood cholesterol levels while 172 (57.3%) were ignorant of it and 108 (36%) never had their blood cholesterol levels checked.

One hundred and ten (36.6%) of the participants were actively involved in vigorous physical activities and stated walking to be the most commonly involved physical sport followed by bicycling, running, swimming and aerobics with the recommended frequency of 5 times per week for a total of 30 minutes of moderate intensity. To assess the

participants concern in regulating their caloric intake they were asked whether they ever contemplated at the caloric information available with the food 32 (10.7%) responded in full affirmation 65 (21.7%) mostly considered it 82 (27.3%) pondered over it at times and 121 (40.3%) responded they never bothered to study the available caloric information showing trivial concern about day-to-day dietary caloric consumption.

Participants who were more at risk for the development of Cardiovascular diseases because of underlying risk factor like obesity and active smoking were asked whether they ever endeavored in losing weight 6 (30%) of the participants answered in affirmation. Similarly 34 (65.3%) of the 52 (17.3%) smoking participants attempted at quitting smoke.

Table-1: Risk factors in students for cardiovascular disease

Risk Factors	n (%)
Increased Blood pressure	20 (6.7%)
Diabetes	2 (0.7%)
Increased cholesterol level	1 (0.3%)
Other cardiovascular diseases	1 (0.3%)
Family history of cardiovascular disease	205 (68.3%)
Smoking	52 (17.5%)
Smoke daily	32 (10.7%)
Smoke occasionally	20 (20.67%)
Overweight	20 (6.7%)

Table-2: Scoring of students concerning cardiovascular disease risk factors knowledge

Score	n (%)
Less than 15	76 (25.3%)
15–20	156 (52%)
Greater than 20	68 (22%)

Table-3: Knowledge of students regarding cardiovascular diseases risk factors

Knowledge of Students of Basic Risk Factors	Correct Response
Smoking	215 (71.7%)
Increased Blood Pressure	258 (86%)
Obesity	234 (78%)
Increased Cholesterol	254(84.7%)
Diabetes	162 (54%)
Stress	245 (81.7%)
Sedentary Lifestyle	246 (82%)
Positive Family History	143 (47.7%)

Table-4: Reasons given by non-concerned students

Reasons mentioned by non-concerned students:	n (%)
1.no need to concern at this age	74 (43%)
2.never thought about this problem	84 (48.8%)
3.any other reason	14 (8.1)

Table-5: Preventive measures adoptive by concerned students

Preventive measure adoptive by concerned students:	n (%)
Cutting down salt intake	45 (35.2%)
Exercising regularly	96 (75%)
Changing eating habits	53 (41.4%)
Stop smoking	33 (25.8%)
Taking medicine	14 (10.9%)
Others	7 (5.5%)

DISCUSSION

Cardiovascular diseases (CVDs) includes a variety of medical conditions mainly comprising of coronary heart disease, rheumatic heart disease, cerebrovascular disease and other numerous conditions.[11] CVDs are the most common cause of mortality worldwide. In 2008, approximately 17.5 million people around the world died from CVD, which is expected to be about 23.3 million by the year 2030.[12] Deaths caused by CVDs can be prevented as most of its risk factors like Blood pressure, Diabetes and raised cholesterol levels are reversible and can be controlled at an early stage. Therefore it is essential to educate the students regarding the risk factors of CVDs and the importance of controlling them at initial stages. Regarding the behavior of medical students towards CAD significant awareness exist in the medical population but considerable discrepancy exist in preventative measures adopted by them for coronary artery diseases.[13] That is why, this research was conducted to find out the awareness of non-medical students regarding cardiovascular diseases so that the students can be enlighten if a poor level of knowledge is observed.

Hypertension is considered as the single most important factor for developing CVD & accounts Sfor 47% of heart disease around the globe.[14] In our study, 20 (6.7%) students have increased blood pressure. Diabetes and Increased cholesterol levels were reported in 2 (0.7%) & 1 (0.3%) students respectively in our study. According to World Heart Federation, Diabetes is a major risk factor for CVD and increases the likelihood of developing CVD at an earlier age.[15] Increased cholesterol level is a major but modifiable risk factor for heart disease and increased triglycerides and high LDL levels increases the chances of acquiring heart diseases proportionately.[16] Other cardiovascular diseases were reported in 1 (0.3%) of students. The results also directs towards the need of frequent screening tests for these major risk factor among students.

Family history of heart disease is an important predictor for an individual to acquire heart disease.[17] A research indicated that relative risk for heart diseases ranges from 2.0 to 9.0 among persons who report a family history for heart disease, depending on the number and type of relatives considered.[18] In our study, 205 (68.3%) students out of 300 reported a positive family history of heart diseases which is very alarming.

Smoking is a well-established risk factor for cardiovascular diseases and 30% of deaths in United States are accounted directly to cigarette smoking.[19,20] Our study showed that 52 (17.5%) students were smokers in which 32 (10.7%) smoke daily while 20

(20.67%) smoke occasionally. This necessitates the increased requirement of smoking cessation programs and workshops regarding awareness to avoid such lethal risk factors.

Body Mass Index is a good tool to assess the likelihood of acquiring heart disease. The normal values are (below 18.5 underweight) (18.5–24.9 normal) (25–29.9 overweight) (30.0 and above obese).[21] A research indicated that increased BMI is directly related to acquired CVD.[22] In our research, 20 (6.7%) students were found to be overweight predicting it as a public health issue.

In assessment of the knowledge of the participants it was observed that only 22% of the people were able to achieve a score of greater than 20. On the other hand, 25.3% of the people were not even able to give 15 correct answers. This shows the lack of awareness among literate population of Karachi. This is similar to a study conducted in Kuwait, where over half of the people were not aware of any type of CVDs.[23] Nonetheless, majority of students in our research were aware of the basic risk factors causing cardiovascular diseases. About 65.7% students answered correctly that the risk of cardiovascular disease increases with age. More than 50% of the students were aware about leading risk factors for CVDs including smoking; raised blood pressure, obesity, increased cholesterol & glucose levels. This is consistent with the research conducted in Kuwait which showed that about half of the people were aware of the majority of risk factors of CVDs.[23] However, our study demonstrated that <50% of students were not aware that positive family history of CVD increases their risk of acquiring heart diseases.

In our study, around 57.3% of participants correctly believed that lightheadedness and chest pain is a symptom of heart attack, while only 43.3% of students were acquainted that a patient during a heart attack would turn pale. Unfortunately only 18.7% of our students indicated that there is no link between visual difficulties and symptoms of heart attack. Our result is consistent with a similar study in Kuwait which indicated that 40.7% of the people lack the knowledge about symptoms of a heart attack.[23] Our study also demonstrated that most of the students were aware of the threat of a person with chest pain with 57.3% students believing it to be a symptom of heart attack. This percentage is greater as compared to a study in China[24] and Nepal[25] where most of their participants answered incorrectly. 31.3% of the students believed that the patient realizes whenever he suffers from a heart attack which is not true as studies have proved that people never get to know the symptoms leading to delayed referral and high mortality rates. Also a study conducted in Karachi showed that about two-third of the patients was delayed in presentation as they failed to realize their symptoms ontime.[26]

Our study showed that less than half of the students failed to realize that prevention of CVDs is possible if proper measures are taken, this is similar to another study indicating that 42.6% of their participants had no awareness about this fact.[27] Our study also pointed out that 67% students had poor level of knowledge about HDL and also regarded it as a risk factor for heart diseases although HDL is proved to be 'Good' cholesterol removing cholesterol from arteries.[28] The values obtained from our study indicates that it is essential to inform students about CVDs so that preventive measures can be practiced from an early age.

Evaluation of the day-to-day attitude and general lifestyle modifications of students regarding CVDs showed that 57.33% of students were not concern regarding the development of coronary artery diseases in future. 48.8% of the unconcerned students never considered this problem where as 43% of the students believe they were too young to be concerned about CAD at this age. However, studies have showed that the initiating events for the development of cardiovascular disease begins in childhood[29] so it is necessary that steps should be taken and lifestyle adaptations should be made from the early age so as to reduce or prevent future implications of cardiovascular diseases. While assessing the preventive measures adopted by concerned students (42.66%), about 35.2% students tried to cut down their salt intake. However studies clearly demonstrate that reduction in salt intake[30] and regular exercise[31] is clearly beneficial in reducing the risk of suffering from long-term morbidity associated with cardiovascular diseases. Current researches show that adolescents are more susceptible to current dietary pattern and globalization of fast food and soft drinks, which affect their dietary pattern more than the adults, and this adverse eating behavior, will upset their body weight, activity levels and long-term possibilities for adversarial health consequences.[32] Our study demonstrated that 41.4% of the students were trying to improve their eating habits by reducing the intake of refined carbohydrates and processed fatty foods and more intakes of fruits and vegetables and lean proteins.

In our study, 43.3% of students were aware of their blood pressure while only 6.7% of students knew their cholesterol level. However current guidelines recommended that all adults over the age of 18 should be screened for hypertension[33] and over age of 20 for dyslipidemia[34] so as to be protected from the hazardous effects later in life. Researchers showed that high calorie diet leads to obesity, making an individual prone to acquire CVDs.[35] Our study demonstrated that 40.3% of the students never bothered to study the

available caloric information indicating no concern about routine dietary caloric consumption. The above outcome showed slight awareness among non-medical student participants and insignificant adoptive behavior to curb down the major risk aspects for cardiovascular diseases.

Physical inactivity is one of the important risk factor for CVDs and according to current American Heart Association (AHA) recommendations, moderate exercise of at least 150 minutes per week or vigorous exercise of 75 minutes per week helps to improve cardiovascular health[36] and studies have proved that sedentary lifestyle is a major hazardous risk factor for both men and women leading to obesity, cardiovascular diseases and increase in both morbidity and mortality.[31,37] In contrast to this, only 110 (36.6%) of the participants in our study were actively involved in athletic activities and sporting leisure thus showing majority have adopted a sedentary routine.

Of the concerned students in this study, 25.8% did consider prohibition of smoking as a healthy behavior while 65.3% of the smoking participants attempted on quitting smoking, which is considered as one of the major modifiable risk factor for CVD. Our data also showed that about 20 of the participants were overweight out of which 70% participants never thought about losing weight while the rest who wanted to were just concerned of their cosmetic appearance again depicting the lack of concern of being involved in cardiac diseases. Thus our study indicates that a minor percentage of students are making efforts to improve their lifestyle towards an healthy outcome whereas the majority still lack awareness or had poor implementations of the healthy practices which calls for these issues to be addressed in young generation.

CONCLUSION

According to our knowledge, this is a first study to assess the knowledge and awareness of cardiovascular diseases among non medical students. Students are considered to be the future of a nation and a part of the community that can actively participate to increase the awareness among general public. Therefore, their knowledge and awareness is crucial for the betterment of society. It is therefore essential to assess knowledge and teach non-medical students about major modifiable health issues like cardiovascular diseases, which is associated with significant mortality and morbidity. Having substantial knowledge regarding non-medical student population education level concerning CAD awareness programs and seminars in collaboration with UNICEF and teaching hospitals can be held in both medical and non-medical varsities with targeted aim to increase the awareness among student population and steps can be taken for implementation of preventive behaviour at public level.

AUTHOR'S CONTRIBUTION

All the authors contributed equally.

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