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RESEARCH ARTICLE

Frequency of hypertension risk factors and level of knowledge among university students

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ABSTRACT

Background: In Pakistan there is a high prevalence of hypertensive individuals. Identification of risk factors and their knowledge in young population could be advantageous.

Objectives: To find the frequency of hypertension risk factors and level of knowledge among university students of twin cities within Pakistan.

Methods: A cross sectional observational study was conducted among university students in twin cities of Pakistan. The sample size was 475. Male and female students with ages ranging from 18 to 30 years with no diagnosed cases of pulmonary and cardiac issues, cancer, physically disabled and impaired cognition were selected to fill the questionnaire. The WHO STEPS instrument was used to get the relevant information needed for this study which included demographics, tobacco use, diet, physical activity, and history of raised blood pressure, history of diabetes and also height and weight.

Results: Out of 475 participants there were 235 (49%) males and 240 (51%) females. Knowledge score of 460 (96.8%) university students was poor. On the other hand, the frequency of risk factors was not found to be significant in this population.

Conclusion: The study concluded that, although the frequency of risk factors for hypertension is low, university students of twin cities have poor knowledge regarding modifiable and non-modifiable risk factors of hypertension.

Key words: hypertension, knowledge level, risk factors, university students

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Introduction:

The normal blood pressure levels are vital for adequate and appropriate functioning of the most important body organs which include heart, kidneys, lungs and brain. According to world heart federation (WHF), annually 9.4 million of global deaths are caused by hypertension. It also adds to the fact that hypertension is very important risk factor in developing other diseases especially elevated risk of developing cardiovascular risk factors which can lead to raised morbidity and mortality rates of diabetic patients especially. Hypertension is dangerous because it is a silent killer as it shows very few symptoms.(1, 2)

Blood pressure ranging from diastolic consistently above 90 mmHg and systolic above 140 mmHg is regarded as hypertension.(3) Hypertension is regarded as one of the non-communicable diseases.(4) The prevalence of hypertension among males in developing and developed countries was found to be 32.2% and 40.8% while in females, it's 30-33%.(5) According to National Health Survey, the prevalence of hypertension in Pakistan was 19.1%. Hypertension patients have lesser awareness and knowledge about the diseases in Pakistan. There was 30-50% ratio of people who were hypertensive and were unaware of them having it.(6,7)

There are higher risks of hypertension among young adults aged from 20-30 as compared to older adult population. In different countries it is established as 40-50%.(8) In 2018 it was estimated that environmental factors are causing hypertension in Americans.(9) According to WHO, hypertension has resulted in 7.5 million deaths which make up 12.8% of total world population.(10,11)

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There are two types of risk factors for hypertension. One is modifiable and other is non-modifiable. The factors included in non-modifiable risk factors are age, race, history, gender, and family.(6) Obesity, alcohol consumption, diet, diabetes, level of physical activity are the elements included in modifiable risk factors. Hypertension mostly remains undiagnosed due to absence of signs and symptoms. In 40% patients suffering from heart failure in Mulago hospital, it was found that elevated blood pressure was the risk factor for cardiac conditions.(12)

According to WHO, hypertension cases in young adult population are increasing and mostly remain unnoticed due to lack of proper screening. But, cases are increasing in young adults according to studies.(4) Thus, knowledge about hypertension must be given to patients before they develop the disease for the purpose of making them more compliant to treatment after developing disease.(6) Non communicable disease surveillance tool is recommended by WHO in its stepwise approach to surveillance (STEPS).This approach constitutes the concept that the surveillance system must involve standardized data collection and flexibility. A complex and comprehensive system relaying on local needs can be developed through this approach. Physical measurements like weight, height, blood pressure, waist circumference are included in interview based questionnaires.

A measure of total blood cholesterol levels of >240mg/dL comes under the category of elevated cholesterol. Diabetes mellitus is condition when the glucose levels in blood become elevated .It is also known as hyperglycemia. In order to reduce the risk of cardio vascular diseases, a diet consisting up of vegetables, fruits, fish, grains and nuts is considered beneficial . Foods such as soya dark chocolates, grapes, etc are rich in flavonoids which enhance the endothelial function and help in lowering of blood pressure. Family history of high blood pressure is one of the non-modifiable risk factor because there is about 5 fold increase in risk of developing hypertension when family history for the disease is positive. First degree relatives like parents, siblings who have experienced any cardiovascular disease before the age of 65 in females and 55 in males come in positive family history.(13) Physical inactivity, consumption of tobacco and diet rich in fats are the factors that predispose an individual to cardiac conditions.(14)

Hypertension is a vital health issue worldwide including Pakistan. According to literature, the incidence is rising not only in elderly but in youngster as well. Knowledge of hypertension risk factors and frequency is essential to control the incidence of hypertension. In accessible literature no study reported knowledge status of hypertension risk factors among university students of twin cities and frequent risk factors, so the current study aimed to enlighten the knowledge of students regarding all these risk factors and also the frequency of these factors among them.

Methods:

It was a cross-sectional survey conducted on male and female university students from the twin cities (Rawalpindi and Islamabad) enrolled in Riphah International University, National University of Modern Languages (NUML), National University of Sciences and Technology, Arid Agriculture University, and National Defense University. Data was collected from March 2019 to June 2019. The targeted sample size was 375 calculated through Raosoft while total number of subjects who participated in the study was 475. Students of both genders with age group 18 to 30 years participated. None of them had a history of or diagnosis of hypertension. Any female or male students with a diagnosed respiratory or cardiac issue were excluded. The STEPS survey instrument was used with its core items (step 1 and 2). Core items from section 3 (biochemical measurements e.g., blood lipids and glucose profile) were not used. The section 1 for the core items consisted of demographic information and behavioral measurements (e.g. smoking, dietary habits, level of physical activity and raised blood pressure and diabetes history). Frequency of risk factors was determined according to percentage of participant's responses. The section 2 comprised physical measurements (height and weight). A measuring tape was used to measure height of the participants in centimeters. A mechanical weighing scale was used to measure the weight of the participants. Knowledge of risk factors was assessed through number of correct modifiable and non-modifiable risk factors of participants enlisted in questionnaire. Those who enlisted 1-5 correct factors categorized in poor knowledge and 6-11 in good knowledge.

Ethical approval was obtained from ethical research committee of Riphah International University, Islamabad (Ref#Riphah/RCRS/REC/Letter-00647) and informed written consent was taken from each participant prior to data collection. Before participation, rational was explained and consent was taken from

students. The questionnaire was explained to the participants before it was filled by them. Data was analyzed using SPSS-21. Descriptive statistics were employed for means and frequencies and data was presented in tables, and pie charts.

Results:

Total number of subjects who participated in the study was 475 in which the frequency of male participants was 240 (51%) and of females were 235 (49%). Mean age of the participants was 21.06±2.07 years and mean BMI 21.12±3.41. Majority of the students (71%) had normal BMI range. (Figure 2) The estimated mean knowledge score is 1.37±1.75. Regarding knowledge of risk factors, 460 (96.8%) students lie in the category of poor knowledge and 15 (3.2%) in good knowledge. (Figure 1)

Table 1: WHO Step Instrument (Core)

CATEGORY	Yes n(%)	No n(%)
SMOKING		
Do you currently smoke any tobacco products such as cigarettes, cigars or pipes?	89 (18.7%)	386 (81.3%)
Do you currently smoke tobacco products daily?	68 (14.3%)	407 (85.7%)
PHYSICAL ACTIVITY		
Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging or construction work] for at least 10 minutes continuously?	171 (36%)	304 (64%)
Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously?	288 (39.4%)	187 (60.6%)
HISTORY OF RAISED BLOOD PRESSURE		
Have you ever had your blood pressure measured by a doctor or other health worker?	310 (65.3%)	165 (34.7%)
Have you ever been told by a doctor or other health worker that you have raised blood pressure or hypertension?	98 (20.6%)	377 (79.4%)
In the past two weeks, have you taken any drugs (medication) for raised blood pressure prescribed by a doctor or other health worker?	20 (20.4%)	78 (79.6%)
HISTROY OF DIABETES		
Have you ever been told by a doctor or other health worker that you have raised blood sugar or diabetes?	28 (5.9%)	447 (94.1%)
In the past two weeks, have you taken any drugs (medication) for diabetes prescribed by a doctor or other health worker?	8 (28.6%)	20 (71.4%)
HISTORY OF RAISED TOTAL CHOLESTROL		
Have you ever been told by a doctor or other health worker that you have raised cholesterol?	34 (7.2%)	441 (92.8%)
In the past two weeks, have you taken any oral treatment (medication) for raised total cholesterol prescribed by a doctor or other health worker?	9 (26.5%)	25 (73.5%)
HISTORY OF CARDIOVASCULAR DISEASE		
Have you ever had a heart attack or chest pain from heart disease (angina) or a stroke (cerebrovascular accident or incident)?	48 (10.1%)	427 (89.9%)

DIET	**Number of Days**		
	1-2	**3-4**	**5-7**
In a typical week, on how many days do you eat fruit?	165 (34.7%)	140 (29.5%)	170 (35.8%)
In a typical week, on how many days do you eat vegetables?	172 (36.2%)	203 (42.7%)	100 (21.1%)

How often is salt, salty seasoning or salty sauce e.g. soya sauce added in your cooking or preparing food in your household?

Always	**Often**	**Sometimes**	**Rarely**	**Never**
13 (2.7%)	51 (10.7%)	153 (32.2%)	138 (29.1%)	120 (25.3%)

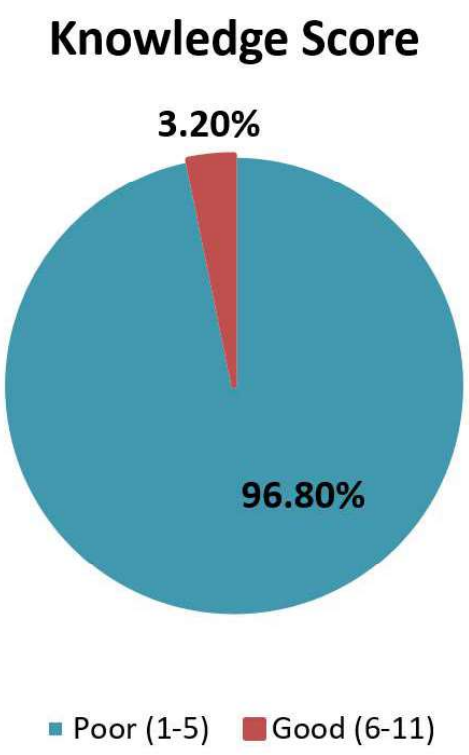

Figure 1: Percentage of knowledge score among students

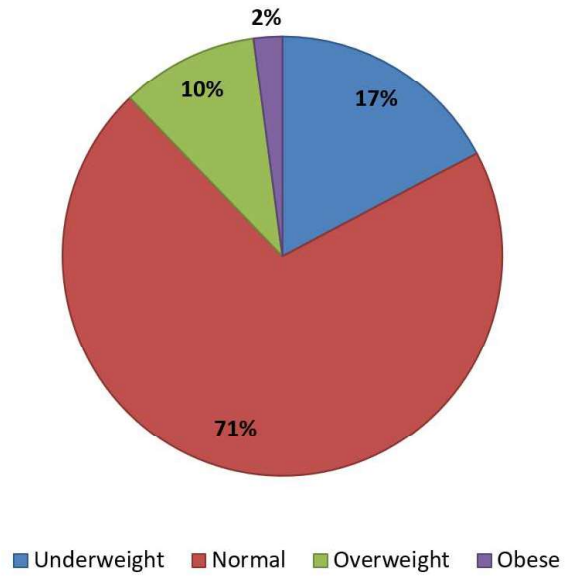

Figure 2: Percentage of BMI categories among students

Discussion:

The study was conducted among the university students to assess their knowledge and risk factor frequencies. The results indicated that although risk factors are not frequent but the respondents have poor knowledge regarding that. The current study demonstrated that 96.8% of students have poor knowledge regarding hypertension risk factors. Another study conducted in DI Khan to determine the distribution of knowledge regarding hypertension among the university students demonstrated that 72.4% students were having good knowledge.(15) Another similar study was conducted to explore the three-dimensional knowledge level of hypertension risk factors in city of Abha, Saudi Arabia. The respondents had a high level of knowledge regarding the risk factors.(16) Both populations demonstrated good knowledge contrary to our population. Awareness programs are required to be conducted in our educational institutes to improve knowledge level of our students so that they can consider these to avoid adopting the disease.

In the present study, 18.7% were smoking tobacco products daily and 64% denied that their work involves vigorous intensity and 60.6% denied that their work involves moderate intensity activity. In an another study conducted among students at Central University in the West Bank the prevalence for the smokers was found to be 29.3% of the 553 students with median age of 21 years. This difference in prevalence of smoking can be because of the reason that in Pakistan females smoke rarely and the data was collected from 42.5% females.(17)

The results of current study indicated that 165 university students were eating fruits for 1-2 days, 140 for 3-4 days and 170 for 5-7 days. Similarly 172 participants were taking vegetables for 1-2 days, 203 for 3-4 days and 100 for 5-7 days. A study on assessment of salt intake among undergraduate health care students studying in London indicate that a frequency of 86 students was taking fruits for more than three days and 46 for less than three. While 40 students were eating vegetables for less than three days in a week; whereas 92 were taking vegetables for more than three, so in both the studies the majority of the population takes fruits for more than three days a week.(18)

Salt is considered one of the major risk factor for hypertension and processed food consist of high level of salt which makes adult population prone to high blood

pressure. In present study we determined the usage of salty sauce in young adults was 32% which indicates that they sometimes use salty sauce in their food. While the study conducted in London reported that about 53% respondents always added salty sauce salt to their food. This shows that there is an increased usage of salt among students in London. This difference can be because of the reason that Pakistani cuisine rarely incorporates salty sauces.(18)

In the same study the frequency for physical activity level was also included , the individuals were grouped into vigorous, moderate, and low physical activity levels whose values are as follows 20.2%, 14.8% and 65.1%. In contrast, the present study assessed that 36% were doing vigorous and 60.6% were doing moderate physical activity. In our study we assessed the number of students who had their blood pressure measured by a doctor were 65.3% and those diagnosed with high BP were 20.6% .Whereas the study on assessment of salt intake behavior among under graduate students studying in London were 93% who have their BP measured, and the subjects diagnosed with high blood pressure were 23%. In a national cohort study of Thai Open University students, the diagnosed cases of hypertension was 4.6%.(19) Mental stress was a factor not included in the current study. Mental stress is a prevalent issue in young population especially students and it also plays a major role in developing hypertension. STEPS survey instrument was used with its core items (step 1 and 2) only. Missing factors e.g. socioeconomic status, renal insufficiency and psychological well-being can be added in future studies as these are also evident to be the risk factor for high blood pressure. Awareness programs regarding knowledge of hypertension risk factors should be conducted in educational institutes to increase awareness of students.

Conclusion:

In this study it was concluded that there was poor knowledge of modifiable and non-modifiable hypertension risk factors among university students of twin cities. None of the risk factor was found much frequent among students which can make them liable to suffer from hypertension in future.

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