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RESEARCH ARTICLE

ASSOCIATION BETWEEN HYPERTENSION AND SMOKING AMONG HAILUNIVERSITY STUDENTS

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ABSTRACT

Background and Methods: The majorities of young people have no healthy life style or dietary habits. In the current study, we investigated the associations between hypertension and smoking among Hail University students in Saudi Arabia. A cross-sectional study was conducted among university students. Randomly, 100 male young students between the ages of 18- 24 years were selected. Data were collected on a self-completed questionnaire in order to record smoking behavior and dietary habits. Body mass index (BMI) and the systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) were measured three times with10–15-min intervals in the sitting position and at the resting state.

Results: The numbers of Participants were 100 students from male university campus aged 18–23years. 48% of participant was within normal weight, 28% overweight and 24% obese. The prevalence of current percentage of smokers in the student population is 32%. Smokers had significantly higher blood pressure and heart rate values than non-smokers. Both university student smokers and non-smokers with history of hypertension in the family had significantly higher values of blood pressure than those without history of hypertension in the family.

Conclusion: A significant elevation of blood pressure and heart rate was observed among young smokers.

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INTRODUCTION

Globally, hypertension is the most prevalent cardiovascular disease and one of the major causes of morbidity and mortality among adults. One billion people are diagnosed with high blood pressure (World Health Organization, 2013). Basically, hypertension is estimated to cause 7.5 million deaths (World Health Organization, 2013). Hypertension is a major chronic public health problem in the kingdom of Saudi Arabia with a prevalence of 26.1 % among adults (Al-Nozha *et al.,* 2007). Blood Pressure is a serious risk factor for premature disability and mortality which contributes to heart diseases and kidney failure (Mancia *et al.,* 2013). Obesity and smoking are factors that lead to deterioration of general health status and are among the most important risk factors for chronic disease and death (Strong *et al.,* 2005). Changing lifestyle, such as increased exercise levels and lower body weight, have been proven to help keep normal Blood Pressure (Mancia *et al.,* 2013; Kokkinos *et al.,* 2009). Smoking has been proven to be a significant health risk.

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The study is aimed to investigate possible cardiovascular health effects of smoking on hypertension and heart rates. Intend to investigate and answer the following question: does smoking influence blood pressure and heart rates among young adult university students in Hail, Saudi Arabia?

MATERIALS AND METHODS

Data collection: The data were collected using combined pre-piloted questionnaires. The questionnaire was administrated to university students at Hail University, Saudi Arabia (100 males). The questionnaire included questions concerned with FIND RISC and questions concerned with physical activity. Prior to filling out the questionnaire, the participants were informed about the objectives of this study and will be requested to fill out the questionnaire.

The FINDRISC test: The part of the FINDRISC test in the questionnaire includes a total of questions regarding age, body mass index (BMI), physical activity. Measurement of BMI and waist circumference Body weight, height, weight was measured using calibrated electronic weighing scales (Proton Digital Scale, Model PHC 309 MD) and height will be measured using a Portable Height Scale (Mentone Educational, Model PE087, Australia).

Table 1. Effect of smoking on blood pressure and heart rate among Hail university students

Parameter	Non-smokers Mean ± SD	Smokers Mean ± SD	P value
SBP	121.50±1.21	127.91±1.17	<0.001
DBP	78.30±1.14	81.95±1.07	<0.001
HR	76.11±1.15	77.98±1.50	<0.05

Table 2. Effect of smoking on blood pressure

Parameter	Smoking/week			
	0	1–2	3–4	>4
Mean SBP ± SD	121.50±1.1 1	125.21±1.15 (p<0.001)	129.30±1.10 (p<0.001)	130.00±1.52 (p<0.001)
Mean DBP ± SD	78.30±1.14	80.±1.64 (p <0.001)	81.±1.58 (p<0.001)	83.±1.25 (p<0.001)

Table 3. Effect of family history of hypertension on blood pressure and heart rate among Hail university students

Parameter	Smoking/Family history of hypertension			
	Non-smokers with negative family history	Non-smokers with positive family history	Smokers with negative family history	Smokers with positive family history
Mean SBP ± SD	121.38±1.11	125.33±1.50 (p<0.001)	128.99±1.25	130.71±1.96 (p<0.001)
Mean DBP ± SD	78.64±1.18	79.11±1.91 (p<0.001)	80.10±1.33	82.89±1.25 (p<0.001)

BMI was calculated as weight (in kilograms) divided by height (in meters) squared. Participants with BMI between 25-30 kg/m2 or greater than 30.0 kg/m2 was defined as overweight or obese respectively. For males, waist circumference of less than 94 cm will be considered low, while 94–102 cm was high and more than102 cm was very high. For females, waist circumference of less than 80 cm was considered low, 80–88 cm will be high and more than 88 cm was very high. For each individual, systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) were measured three times with 10–15-min intervals. Measurements were recorded while participants were in the sitting position and at the resting state. Calibrated mercury Sphygmomanometers were used for most measurements, while the use of electronic devices was kept to the minimum. The mean of blood pressures and heart rate values was calculated by dividing the total values on the number of measurements. Ethical consideration: Ethical approval was obtained from the Ethics and Research Committee at Hail University, Saudi Arabia. Participation will be voluntary and verbal consent will be acquired from each participant. Confidentiality of all participants was maintained as no identifying information will be collected or recorded. Statistical analysis: Statistical Packages for the Social Sciences (SPSS) version 13.0 will be utilized for data analysis. The demographic variables (age, weight, height, BMI, BP) were expressed as mean ± standard deviation. The frequencies of risk factors of dietary habits were expressed as a percentage. Differences between male and female participants will be estimated using a Chi-squared test (for categorical variables) and Student's t-test (for continuous variables) according to the statistical distribution of the data. Differences were considered statistically significant at (P<0.05).

RESULTS AND DISCUSSION

Overall, the numbers of Participants were 100 students from male university campus aged 18–23years. 48% of participant was within normal weight, 28% overweight and 24% obese. The prevalence of current percentage of smokers in the student population is 32%.The current result was agreed with the study done by (Bandar Aloufi, 2015).

The current study showed that Hailuniversity student Smokers had significantly higher blood pressure and heart rate values than university student non-smokers (Table 1) similar observations were found by (Shafagoj and Mohammed 2002). The study illustrated that blood pressure values were directly associated to the frequency of smoking (Table 2). It was showed that higher values for SBP and DBP values were reported among individuals smoking more frequently (Table 2)similar findings were recorded by (Maziak *et al.,* 2004a, b, c, d). Both Hail university student smokers and non-smokers with history of hypertension in the family had significantly higher values of blood pressure than those without history of hypertension in the family (Table 3).similar observations were reported by (Al-Safi 2005). In conclusion, Smoking causes cardiovascular health diseases among Hail young university students. In this study, blood pressure and heart rate values were significantly higher in smokers compared to non-smokers. Further studies are needed to examine further the association of smoking and physical activity, as well as other lifestyle risk factors, with Blood pressure changes.

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