



Obesity Associated Hypertension in University Staff at SMBBMU Larkana, Pakistan

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Authors' contributions

This work was carried out in collaboration among all authors. Authors MPS, AH, FJS, SAS and MHK designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors SN, ZS, IS, KU, AAU, RS and RSA managed the analyses of the study. Author FJS managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Objectives: To determine the association of obesity and hypertension among the faculty members of Shaheed Mohtarma Benazir Bhutto University Larkana.

Methods: A cross-sectional descriptive study was conducted on 340 subjects from SMBB Medical University. A self-administered questionnaire, mercury sphygmomanometer, stethoscope, weighing

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and height scales were the research instruments, data was entered and analyzed using the statistical program for social sciences SPSS version 19.

Results: A 340 subjects were included in the study. There were 123 (36.2%) female and 217 (63.8%) male participants, Prevalence of hypertension in the sample was 31.5% (27.6% in females and 33.6% in males) Hypertension was more comparatively more prevalent in overweight group (39.3%) and obese group (32.5%).

Conclusion: Obesity is an important public health challenge in the study setting and its highly associated with HTN. Prevalence of Obesity and hypertension among university teachers was observed significantly higher compared to the general population. Measures to prevent the obesity and hypertension are strongly recommended.

Keywords: Obesity; hypertension; cardiovascular diseases.

1. INTRODUCTION

Increasing body mass index has been strongly associated with hypertension and cardiovascular challenges. There is a list of central and peripheral malfunctions which justify the continuous raised arterial blood pressure in overweight and obese subjects [1]. The physiology through which demonstrates the direct relation of obesity to hypertension still a wide subject of research. Researchers consider the activation of the sympathetic nervous system to have a significant role in the pathogenesis of obesity-associated hypertension [2]. On the other hand, World Health Organization defines hypertension as “systolic blood pressure >140 mm Hg or diastolic blood pressure >90 mmHg or being in treatment for 2-3 years” [3]. Globally cardiovascular diseases account for approximately 17 million deaths in a year, nearly one third of the total deaths per year, of these, complications of hypertension account for 9.4 million deaths worldwide every year. Hypertension is responsible for at least 45% of deaths due to heart disease and 51% of deaths due to stroke [4].

The study was aimed to estimate the prevalence of hypertension and determine associated factors among teaching faculty of SMBB Medical University. Having a least number of available studies on prevalence of hypertension in the study setting was the driving force for researchers to carry out this study. Study has estimated the prevalence of hypertension and determined its risk factors and their association with hypertension which will be used to employ strategies to prevent the hypertension. The aim of the study is to estimate the prevalence of HTN among university lecturers and determining the associated risk factors which can help the policy makers and individuals with similar life style to adjust their life style accordingly and modify the

policies for prevention and control of hypertension.

2. LIMITATIONS OF THE STUDY

A self-administered questionnaire was used to collect the data, respondents were asked in the questionnaire whether they were known hypertensive, Researchers did not use reasonable measures to diagnose the hypertension, therefore the possibility of undiagnosed cases of hypertension can't be excluded.

In both campuses of the university, number of female teachers was lesser compared to males, though we put our efforts to include reasonable number of females in the study, yet it was not possible to come up with an equal number of male and female participants.

3. METHODOLOGY

A cross-sectional observational study was conducted to determine the association of obesity and hypertension and estimate the prevalence of hypertension among teachers of SMBB Medical University. All the teachers working at SMBB Medical University Larkana were included in the study population including lecturers, demonstrators, assistant professors, associate professor and professors working at the university. We included senior registrars and postgraduate trainees in the study since they were involved in bedside teaching at the university hospital.

Study subjects were male and female teachers of SMBB Medical University. The list of faculty members from the HR department of the university, list of PG trainees /Medical officers /Sr. registrars from the relevant hospital wards. BMI was calculated using formula weight in kilograms / height in meter square. Height and

weight was measured using weight machine and measuring tape.

4. STATISTICAL METHODS

We examined prevalence odds ratios (ORs) for status of hypertension and Logistic Regression analysis for different categories age of BMI where BMI was subdivided into underweight, normal, overweight and obese. Frequency and descriptive statistics was used for age and gender, Chi square test was used to determine the association of hypertension to obesity, age (categorized) and gender.

5. RESULTS

Out of 340 participants, 123 (36.2%) were females and 217 (63.8%) were male participants. The mean age of the participants was 45.06 with minimum age 25 and maximum age 59 with a standard deviation of 9.65 years. Out of 340, 107 (31.50%) were known case of hypertension while the rest 233 (68.50%) were not hypertensive Table 1.

The highest number of participants in the study were overweight i.e. 39.7% out of 135 total subjects. There were 83 (24.7%) obese participants, 117 (34.4) and only 1.5% 5 were underweight. The OR for BMI category Overweight, 6.455 (95% CI 2.010-20.727) for BMI category Obese, 7.030 (95% CI 1.934-25.547) where the BMI category normal was kept as reference value Table 2.

We observed that increasing BMI significantly increased the chances of prevalence of hypertension, this association was also highly significant with $p=0.019$, the overweight participants were more likely to develop

hypertension than normal group (OR 6.455 95% CI: 2.010-20.727) as detailed in Table 2.

6. DISCUSSION

It was observed that obesity was strongly associated with hypertension in our study. Out of 340 participants, 123 (36.2%) were females and 217 (63.8%) were male participants, with male to female ratio of 1.76:1 nearly similar ratio of male to female participants was observed in another study where the majority, 1,124 (60.2%), of the participants were male and 742 (39.8%) were female with the male to female sex ratio of 1.5 :1 [5].

The mean age of the participants was 45.06 with a standard deviation of 9.65 years. The mean age of the participants was 36.03 with a standard deviation of 11.91 years [5] In our study its visible that hypertension was more prevalent in males, similar findings were observed in a study where Predictors of pre-hypertension were male gender (aOR = 3.22, CI: 2.49- 4.16), age ≥ 40 , and BMI ≥ 25 [6].

Out of 340, 107 (31.5%) were known case of hypertension while the rest 233 (68.5%) were not hypertensive. Comparatively higher than a study conducted on bankers and teacher in Ethiopia, The prevalence of hypertension in the study was 21% (95% CI = 19.15, 22.85) [5]. Compared with studies conducted in recent past in Pakistan, our study observed higher prevalence of hypertension as compared with the study conducted in Hayatabad Peshawar, Pakistan [7].

The prevalence of HTN was relatively lesser in a study conducted among secondary school teacher in Jeddah where 25.2% & 43.0%, respectively, among the sample of 1476 teachers [6].

Table 1. Age, gender and prevalence of HTN

Socio-demographic characteristics	n (%)
Prevalence of hypertension	
Hypertensive	107 (31.5%)
Non-hypertensive	233 (68.5%)
Gender	
Male	217 (63.8%)
Female	123 (36.2%)
Age (mean 45.06, SD ± 9.65)	
≤ 45	94 (27.6%)
45 - 51	173 (50.9%)
≥ 52	73 (21.5%)

Table 2. Multiple logistic regression analysis of association of BMI and age with HTN

Characteristics	n (%)	Hypertension		MLRA
		No n (%)	Yes n (%)	Adjusted OR (CI 95%)
Age (mean 45.06 SD 9.65)				
≤ 45	94 (27.6%)	79 (84)	15 (16)	Ref.
45 - 51	173 (50.9%)	115 (66.5)	58 (33.5)	2.183 (0.746-6.387)
≥ 52	73 (21.5%)	39 (53.4)	34 (46.6)	11.105 (2.447-51.413)
BMI				
Normal	117 (34.4)	90 (76.9)	27 (23.1)	Ref.
Underweight	05 (1.5)	05 (100)	00 (0)	0
Overweight	135 (39.7)	82 (60.7)	53 (39.3)	6.455 (2.010-20.727)
Obese	83 (24.7)	56 (67.5)	27 (32.5)	7.030 (1.934-25.547)

The highest number of participants in the study was overweight with 39.7% and 135 total subjects. Our results are comparatively very high to findings of a study conducted in Ethiopia where 26.3% were overweight [5]. There were 83 (24.7%) obese participants, 117(34.4) and only 1.5% were underweight while underweight participants were 12.6% [5]. The OR for BMI category Overweight, 6.455 (95% CI 2.010-20.727) for BMI category Obese, 7.030 (95% CI 1.934-25.547) where the BMI category normal was kept as reference value. Of the 340 respondents, 34.4% had a normal BMI, 39.7% and 24.4% were overweight and obese respectively. This is comparatively lower than a study conducted in Pakistan [8].

However lower odds ratio were observed in previous study for age ≥ 40 years (aOR= 4.31, CI: 2.77, 6.73), Body Mass Index (BMI) ≥ 25 (aOR= 3.03, CI: 1.77-5.19), males, [6] there were 16% in males and 22% in females in study conducted in Hyderabad Siindh [9] while the overall prevalence of hypertension was 26% (95% C.I. 23, 29), the prevalence among males (34%) was higher than females (24%) in Karachi Pakistan in 2004 [10].

7. CONCLUSION

Obesity and hypertension is an important public health challenge in the study setting. The prevalence of Obesity hypertension among teachers of SMBB Medical University was observed significantly higher compared with other studies conducted in Pakistan.

The risk factors, age, gender and BMI showed an association with hypertension, Risk factors which showed significant association were age and BMI.

8. RECOMMENDATIONS

There is dire need of awareness programs to initiate at mass level to educate the people for prevention and control of Obesity and consequently that of hypertension. There is available ground for researchers to evaluate the factors associated with higher prevalence of obesity and HTN among educated and especially medical persons despite sufficient knowledge. Government and authorities should involve bring community programs to motivate the individuals to a modified lifestyle in order to prevent and control obesity and hypertension.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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