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Original Article

Prevalence of Obesity and Hypertension and Related Factors among Bank Employees in Zahedan, 2017

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Abstract

Background and aims: Obesity and hypertension are the major threats to health in a sedentary lifestyle and stressful jobs. The bank employees have sedentary jobs with high mental stress. The aim of this study was to determine the prevalence of hypertension and obesity and related factors among bank employees in Zahedan, located in Sistan and Baluchistan province, Iran.

Methods: In this cross-sectional study, 350 employees aged 23 to 57 years were randomly selected out of 15 bank branches from December 2016 to February 2017. An information form including demographic data (i.e., age, education levels, experience years in the banking profession, and physical activity) was completed for each participant. Body mass index (BMI) was assessed for the determination of general obesity. In addition, waist circumference (WC) and waist-to-height ratio (WHtR) were measured for the evaluation of abdominal obesity. Two recordings of blood pressure (BP) were obtained in a sitting position. Finally, a multivariate logistic regression analysis was used to examine the independent predictors of hypertension.

Results: The prevalence of pre-hypertension and hypertension were 33.1% and 61.1%, respectively. Further, the rates of overweight and obesity were 49.1% and 10.3%, respectively. Furthermore, elevated WC and high WHtR were 20.9% and 59.4%, respectively. Based on the results, the prevalence of obesity and hypertension increased significantly by aging.

Conclusion: In general, the results of the study showed that the prevalence of overweight and hypertension among bank employees was high compared to the general population. Thus, periodic screening is recommended for an early determination of hypertension.

Keywords: Hypertension, Obesity, Bank employees

Introduction

According to epidemiological studies, long work hours,[1] sedentary lifestyle,[2-4] and stressful jobs[1-3] are considered as important contributors to obesity and hypertension.

Obesity, as the sixth risk factor causative to disease in the worldwide,[5] is defined as fat accumulation in the abnormal or excessive pattern in adipose tissue, which may cause several serious health concerns, including some non-communicable chronic diseases such as chronic vascular disease, hypertension, diabetes, fatty liver, and cancer.[1,6] Both generalized and abdominal obesity are the leading causes of mortality and morbidity.[7]

The prevalence rates of obesity[8] and hypertension[8,9] are rising continually worldwide and in developing countries including Iran. It is estimated that up to 57.8% of people in different areas of the world become respectively overweight and obese by 2030.[10] The prevalence rates of general and abdominal obesity were reported to be within the range of 2.6%-18.3% and 5.6%-30.2%, respectively, across Iran.[11] High blood pressure (BP) is ranked as the third cause of disability in life[3]. The prevalence of hypertension, as a consequence of new lifestyle and obesity,[12] ranged from 15% to 37% in the world[13] and 32.5% in Iran.[9] Based on the estimation of the World Health Organization (WHO), 600 million people in the world are at the risk of cardiovascular diseases such as coronary heart disease, myocardial infarction, and stroke due to hypertension.[14] High BP is directly responsible for

49% of ischemic heart disease and 62% of cerebrovascular diseases, which are the most frequent causes of deaths in developing countries. Evidence suggests that job-related risk factors are increasing in the bank employees and other similar jobs of the sedentary lifestyle with long work hours and high mental stress.[2-4,15]

Sedentary lifestyle and stress are vital risk factors for hypertension. A sedentary and stressful job as a bank employee makes banking a potential occupational risk group for hypertension.[3]

The control of hypertension requires the modification of its risk factors and hence necessitates identifying various risk factors of hypertension among bank employees. Studies on obesity and hypertension among bank employees are limited in Iran, especially with no one focused on this issue in Sistan and Baluchistan. The studies conducted in India[15] and Nigeria[4] showed that the prevalence rates of hypertension among bankers were 69.5% and 34%, respectively. Another study in India demonstrated that 36%, 62%, and 39.3% of the bankers had general and abdominal obesity and hypertension, respectively.[3] Considering that the study of occupational risk factors in stressful and sedentary jobs is necessary for the programming of health policies, this study aimed to estimate the prevalence of obesity and hypertension and related factors among bank employees of Zahedan in Sistan and Baluchistan province, located in the South-East of Iran.

Methods

The present descriptive cross-sectional study was performed among 360 employees of the banks (296 males and 54 females) from 15 bank branches of Zahedan, located in the South-East of Iran. The data were collected using a simple random sampling technique from December 2016 to February 2017. The inclusion criteria included at least 1 year of work experience in the banking profession. On the other hand, those individuals who used corticosteroids in the past 2 years or had a history of endocrine disorders such as diabetes, kidney disease, cardiovascular disease, and cancer, as well as pregnant women, were excluded from the study. The sample size was determined based on the prevalence of obesity (40%) among bank employees in a previous study.[3] It was estimated based on 5% significant level and 50% allowable error, which was calculated using the following formula:

$(z_{1-a/2})^2 (p\ q)/d^2$ n= (1.96*1.96) (0.40*0.60)/(0.05*0.05)= 360

An information form including questions about demographic data such as age, education levels, experience years in the banking profession, and physical activity was completed for each participant. Further, physical activity was considered as walking at least three times a week for $\geq$ 30 minutes, and individuals who had no physical activity at work or during leisure time were considered as

cases with physical inactivity.[16] Before starting the study, permission was taken from the branch managers and informed consent was obtained from the employees.

Assessment of Anthropometric Measures

Weight, height, and waist circumferences (WC) were measured by a trained medical student by using zero-calibrated instruments. The weight was measured to the nearest 100 g with a lightly dressed condition and shoeless by a digital scale. Moreover, the height was measured to the nearest 0.5 cm in a standing position using the stadiometer. Additionally, body mass index (BMI) was recognized for the evaluation of general obesity and was calculated as weight (kg) divided by height squared (m²). BMI was categorized as normal (18.5-24.9), overweight (25 to 29.9), and obese ($\geq$30 kg/m²) according to the WHO criteria.[7] Similarly, WC and waist-to-height ratio (WHtR) were used for the evaluation of abdominal obesity. Likewise, WC was measured by a non-elastic tape in a standing position and recorded to the nearest 0.1 cm at the narrowest part of the abdomen between the top of the iliac crest and the lowest margin of rib in the midaxillary line. WC >102 cm in men and WC >88 cm in women[7], along with WHtR >0.5 in both men and women, were considered as abdominal obesity.[17]

Blood Pressure

BP was measured after at least five minutes of rest in the sitting position and a second reading was taken 10 minutes after the first one. The mean of the 2 BPs was considered for analysis. In addition, the measurement was performed on the right arm using a digital manometer (Model ALP K2; K2-231, Japan). Further, the hypertension was classified according to the Joint National Committee on detection, evaluation, and treatment of high BP.[18] The BPs ranging from 120-139 mm Hg systolic and/or 80-89 mm Hg diastolic were considered as pre-hypertension. Similarly, the systolic BP $\geq$140 mm Hg and or diastolic $\geq$90 mm Hg were defined as hypertension. The known cases of hypertensive (diagnosed by a physician) or on anti-hypertensive medications were classified identically as well. All participants refused to smoke a cigarette or drink caffeine during the 30 minutes prior to measurement.

Statistical Analysis

The obtained data were analyzed using SPSS, version 20 (SPSS Inc., Chicago, USA). The data were presented as mean ± standard deviation (SD) and the prevalence rates were represented as the percent. Furthermore, student t test and chi-square test were used for the analyses of numeric and categorical variables, respectively. Fischer exact test was also utilized where cell counts were less than five. Moreover, multivariate logistic regression analysis was applied to examine the independent predictors of hypertension. Finally, the odds ratio and a 95% confidence

interval were calculated for the variables that were entered into the logistic regression model. $P < 0.05$ was considered statistically significant.

Results

The results demonstrated that the overall mean age of participants was 39.9 ± 8.3 years (within the range of 23-57 years) and their mean of experience in the banking profession was 16 ± 8.9 years (ranged between 1 and 30 years). Moreover, 296 (84.6%) of participants were males and 54 (15.4%) were females. The mean levels of the WC and WHtR were 93 ± 10.2 cm and 0.52 ± 0.06 in males, as well as 89 ± 10.3 cm and 0.54 ± 0.06 in females, respectively. The mean levels of BMI in males and females were 25.9 ± 3.1 and 25.7 ± 3.6 kg/m^2, respectively. Likewise, the mean levels of systolic BP and diastolic BP were 150 ± 21 and 93 ± 15.3 mm Hg in males, as well as 140.2 ± 18.6 and 88.3 ± 14 mm Hg in females, respectively. These differences were not statistically significant ($P > 0.05$). Table 1 summarizes the general characteristics of the studied population by gender. Overall, the considerable proportions of the study population (71.4%) were in the age groups of 30 to 50 years. Additionally, 49.1% and 10.3% of employees were overweight and obese, respectively. The prevalence of overweight among males was higher than that among females (51.4% vs. 37%), while women had a higher prevalence of obesity compared to men (16.7% vs. 9.1%). However, the significant difference between the genders was not apparent ($P = 0.08$). The rates of abdominal obesity based on the WC and WHtR were 20.9% and 59.4%, respectively, indicating that females had a significantly higher prevalence in terms of the two above-mentioned parameters ($P < 0.001$). The BP pattern showed that 61.1% of subjects were hypertensive and it was more common in males than females, but the difference was slightly significant (63.2% vs. 50%;

Table 1. Demographic and Anthropometric Characteristics of Bank Employees by Gender

Variables	Total	Male	Female	P Value
Age (y), No. (%)		(n=296)	(n= 54)	0.0001
<30	49 (14%)	31 (10.5%)	18 (33.3%)	
30-50	250 (71.4%)	219 (74%)	31 (57.45)	
>50	51 (14.6%)	46 (15.5%)	5 (9.3%)	
BMI, No. (%)				0.08
Normal	142 (40.6%)	117 (39.5%)	25 (46.3%)	
Overweight	172 (49.1%)	152 (51.4%)	20 (37%)	
Obese	36 (10.3%)	27 (9.1%)	9 (16.7%)	
WC, No. (%)				0.001
Normal	277 (79.1%)	242 (81.8%)	35 (64.8%)	
High	73 (20.9%)	54 (18.2%)	19 (35.2%)	
WHtR, No. (%)				0.001
Normal	142 (40.6%)	132 (44.6%)	10 (18.5%)	
High	208 (59.4%)	164 (55.4%)	44 (81.5%)	
Blood pressure, No. (%)				0.057
Normotensive	20 (5.7%)	14 (4.7%)	6 (11.1%)	
Pre-hypertensive	116 (33.1%)	95 (38.9 %)	21 (32.1%)	
Hypertensive	214 (61.1%)	187 (63.2%)	27 (50%)	
Physical activity, No. (%)				0.2
No	239 (68.3%)	198 (66.9%)	41 (68.3%)	
Yes	111 (31.7%)	98 (33.1%)	13 (24.1%)	
Work experience, No. (%)				0.001
<5 (year)	53 (15.1%)	38 (12.8%)	15 (27.85%)	
5-10 (year)	65 (18.6%)	50 (16.9%)	15 (27.8%)	
>10 (year)	232 (66.3%)	208 (70.3%)	24 (44.4%)	
Education levels				0.08
Under diploma	45 (12.9%)	42 (14.2%)	3 (5.6%)	
Diploma and over	305 (87.1%)	254 (85.8%)	51 (94.4%)	

Note. BMI: Body mass index; WC: Waist circumference; WHpR: Waist-to-hip ratio; WHtR: Waist-to-height ratio.

Table 2. Comparison of Age, Gender, BMI, WC, WHpR, and WHtR Based on Blood Pressure Pattern

Variables	Normotensive(n=20)	Pre-hypertensive (n=116)	Hypertensive (n=214)
Age (y)			
< 30	3 (6.1%)	22 (44.9%)	24 (49%)
30-50	17 (6.8%)	87 (34.8%)	146 (58.4%)
>50	0 (0 %)	7 (13.7%)	44 (86.3%)
	χ^2=18.2	P<0.001	
Gender			
Male	14 (4.7%)	95 (32.1%)	187 (63.2%)
Female	6 (11.1%)	21 (38.9%)	27 (50%)
	χ^2=5.2	P=0.03	
BMI			
Normal	11 (7.7%)	61 (43%)	70 (49.3%)
Overweight	9 (5.2%)	46 (26.7%)	117 (68%)
Obese	0 (0%)	9 (25%)	27 (75%)
	χ^2=15.8	P<0.001	
WC			
Normal	14 (5.1%)	192 (69.3%)	71 (25.6%)
High	6 (8.2%)	24 (32.9%)	43 (58.9%)
	χ^2=1.1	P=0.02	
WHtR			
Normal	5 (3.5%)	93 (65.5%)	44 (32%)
High	15 (7.2%)	72 (34.6%)	121 (58.2%)
	χ^2=3.1	P<0.01	
Physical activity			
No	14 (5.9%)	73 (30.5%)	152 (63.6%)
Yes	6 (5.4%)	62 (55.9%)	43 (38.7%)
	χ^2=2.3	P=0.03	
Work experience			
<5 (year)	1 (1.9%)	22 (41.5%)	30 (56.6%)
5-10 (year)	4 (6.2%)	20 (30.8%)	41 (63.1%)
>10 (year)	15 (6.5%)	74 (31.9%)	143 (61.6%)
	χ^2=3.1	P=0.52	
Education levels			
Under diploma	5 (11.1%)	16 (35.6%)	24 (53.3%)
Diploma and over	15 (4.9%)	100 (32.8%)	190 (62.3%)
	χ^2=3.2	P=0.19	

Note. BMI: Body mass index; WC: Waist circumference; WHtR: Waist-to-height ratio.

$P = 0.057$). Regarding the physical activity and educational levels, most participants (68.3%) did not practice physical activity in their leisure time per week, and 87.1% were educated (diploma and over). However, the significant difference was not demonstrated among genders. Similarly, 66.3% of individuals had more than 10 years of experience in the banking profession and the experience years of banking profession were higher in males than females ($P < 0.001$). As shown in Table 2, the prevalence of hypertension was significantly higher ($P < 0.001$) in the age group of >50 years (86.3%) as compared to the age group of 30-50 years (58.4%) and was higher among

males ($P = 0.03$). About 68% and 75% of overweight and obese subjects had hypertension ($P < 0.001$). Additionally, 58.9% of participants with high WC ($P = 0.02$) and 58.2% with high WHtR ($P < 0.01$) suffered from hypertension. The rates of hypertension among individuals with higher education levels and work experience >10 years in banking profession that did not practice any physical activity were higher (62.3%, 61.6%, and 63.6 %, respectively; $P > 0.05$). In a multiple regression model, increased age (odds ratio [OR]=1.91, 95% CI: 0.45-2.1; $P < 0.0001$), BMI (OR=2.4, 95% CI: 2.37- 2.52; $P < 0.0001$), WC (OR=1.97, 95% CI: 1.5-2.6; $P = 0.006$), and WHtR

Table 3. Logistic regression analysis for predictive association of blood pressure and other variables

	OR(CI 95%)	Standardized Coefficients Beta	t	Pv
Age	1.91(0.45-2.1)	0.391	2.657	0.000
BMI	2.4(2.37- 2.52)	0.347	5.086	0.000
WC	1.97 (1.5-2.6)	0.404	2.760	0.006
WHtR	1.46 (0.9-2.3)	0.673	4.817	0.000
Work experience	1.5(0.9-2.1)	-0.259	-1.750	0.081
Physical activity	1.6(1.4-2.5)	-0.149	-3.043	0.003
Education levels	0.8(0.4-1.5)	0.015	0.305	0.071

Note. BMI: Body Mass index; WC: Waist circumference; WHtR: Waist-to-height ratio; OR: Odds ratio; CI: Confidence interval.

(OR=1.46, 95% CI: 0.9-2.3; *P* < 0.0001), as well as physical inactivity (OR=1.6, 95% CI: 1.4-2.5; *P*= 0.003), were the only risk factors associated with hypertension after adjustment for sex. On the other hand, the years of experience in banking profession (OR=1.5, 95% CI: 0.9-2.1; *P*= 0.08) and education levels (OR=0.8; 95% CI: 0.4-1.5; *P*= 0.07) were weakly associated with hypertension (Table 3).

Discussion

Previous evidence indicates that stressful jobs, along with low physical activity, are important risk factors for hypertension[4] and obesity.[1,2] In this study, about half of the employees (49.1%) were overweight and 10.1% were obese. This is in agreement with the findings of other studies in which the prevalence rate of obesity in bankers and other sedentary jobs was found to be higher. For example, a study conducted in Nigeria[4] demonstrated that 14.4% and 20% of bank employees in addition to 35.6% and 15.5% of traffic wardens were overweight and obese. A high prevalence rate of overweight (36.9% and 36%) and obesity (17.9% and 8%) was found among bank employees and military officers in Brazil.[19,20] Although BMI is considered as an important and direct factor in the causation of arterial hypertension,[20] the use of BMI alone is not enough to distinguish obesity due to changes in height and body composition and the excess fat accumulation in older persons. The evaluation of abdominal obesity contributes to better diagnosis of cardiovascular risk factors and other chronic diseases.[21] WC, as one of the risk factors of metabolic syndrome, is a good marker for the screening of obesity. Waist-to-hip-ratio also indicates abdominal fat accumulation, but the use of waist-to-hip-ratio has recently been challenged due to the difficulty of measurement and less reliability.[22] However, WHtR has been recommended as a simple screening tool and a more convenient indicator for assessing central adiposity, which could be superior to BMI and WC for the evaluation of cardiometabolic risk in both men and women.[23] In the present study, the prevalence rates of abdominal obesity based on WC and WHtR were 20.9% and 59.4%, respectively. These rates were higher in females when compared to males (35.2%

and 18.2% *vs.* 81.5% and 55.4%, respectively).
The multiple regression model represented that the risk of having elevated BMI and high WHtR in the age group of >50 years and those who did not have physical activity at work and during leisure time was higher. A multi-ethnic study of atherosclerosis performed among 6814 persons aged 45-84 years revealed that increased BMI was associated with more adverse levels of BP, lipoproteins, and fasting glucose, along with the higher prevalence of hypertension.[24] The results of another study among the Asia Pacific population demonstrated that the increase of fat tissue was associated with a higher risk of ischemic heart disease.[25]

The evidence shows that work-related activities have decreased among industrialized countries in recent decades.[26] Some researchers demonstrated that low physical activity is an important risk factor for obesity.[16,27] In our study, 68.3% of bank employees had no physical activity in their leisure time per week. In another study, the prevalence of a sedentary lifestyle throughout European countries ranged from 43.3% to 87.8%.[28] The rate of such prevalence among bank employees of Ilorin metropolis in Nigeria was found to be 30%; the bankers who worked over 15 years in the bank profession were more sedentary, and a relationship was observed between the sedentary lifestyle and overweight-obesity, which confirms the results of our study. Based on previous evidence, at least 30 minutes of moderate to high activity is necessary for adults throughout the week.[16]

However, based on the above-mentioned results, it is suggested that the high percentage of overweight and high WHtP, especially in elderly bankers, may be related to a sedentary lifestyle of work, as well as the lack of physical activity in leisure time and the years of employment,[19] which are likely to affect the cardiometabolic risk.[4]

Hypertension, as one of the cardiometabolic syndrome components, has been increasing for the last decade.[29] In a systematic review in Iran during 1988-2012, the prevalence of hypertension was found to be 22% (23.6% in men and 23.5% in women), which was close to those reported in Middle Eastern countries.[14] In some studies, its prevalence among bankers was found to be 34.4%[4] and 32.5%,[19] and it was reported 22.2%[4] among traffic wardens. Based on

the results of another study, the prevalence among young military officers was 22% and obese and overweight individuals had a higher rate of hypertension than normal weight subjects.[20] Overall, the current results indicated that the prevalence of hypertension was 61.1% and the highest prevalence (86.3%) was found in the ages >50 years. In addition, the prevalence was higher in males than females (63.2% vs. 50%, respectively). This finding is in line with the results of other studies.[12,14,30] However, the variations in the prevalence of hypertension by age groups in Iran showed that the prevalence was higher in women over the age of 40 years[14] that seems to be due to the sample size and the age of women contributing to this study.

In contrast to the case of hypertension, the prevalence of pre-hypertension was 33.1%. Although the prevalence was more common in males than females (38.9% vs. 32.1%), there was no significant difference between men and women in this respect. In agreement with a previous study, the prevalence of pre-hypertension tended to decrease by age increase in both males and females.[31] Several causes including obesity and sedentary lifestyle were reported as the risk factors of hypertension in urban areas in different countries.[12,14] In the current research, the risk of hypertension among obese and inactive subjects was higher. In addition, the relatively high prevalence of hypertension was found among individuals with a college education and those who had more than 10 years of experience in the banking profession. The findings suggest that hypertension in the studied population might be associated with the nature of their job, sedentary lifestyle, and increased adiposity, which could be a causative factor for the development of cardiovascular diseases in these individuals.

Our study had a few limitations. First, it was its cross-sectional design, which failed to determine causality. Further, the low sample size of females and failure for the assessment of dietary intakes and other factors affecting lifestyle, including social and economic status, could be mentioned to name just a few. However, the lifestyle variables are closer to the result and it is believed that the socioeconomic variables have no direct effect on arterial hypertension.[20]

Thus, future studies are required to investigate the causes and associated factors that affect lifestyle in bank employees.

Conclusion

In general, the results of the study showed that bank employees had a high prevalence of overweight and hypertension, and obesity, low physical activity, and aging were demonstrated as the risk factors for hypertension, which could be a causative factor for the development of cardiovascular diseases in these individuals. Therefore, it is essential to pay more attention to the education of staff in order to improve lifestyle, encourage exercising, and increase physical activity in leisure time as the most important urgent action strategies to prevent and control hypertension and obesity.

Acknowledgments

Conflict of Interest Disclosures

None.

Ethical Approval

This study was approved by the Ethics Committee of Zahedan University of Medical Sciences (IR.ZAUMS. REC.1395. 34).

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