

Association between Occupational Stress and Hypertension in a Sample of Female Physicians

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Abstract:

Background: Occupational stress is involved in the development of hypertension and there are different numbers of studies examined the occupational stress aspects including job insecurity, strain and control, satisfaction, work hours, and perceived dissatisfaction.

Objectives: To estimate the prevalence of hypertension among female physicians, to identify associations between occupational stress and hypertensive status and to evaluate socio-demographic characteristics in female physicians.

Methods: Cross-sectional study was conducted on 600 female physicians in Baghdad and Al-Imamein Al-Kadhimaain Medical Cities, through the period March 15th till August 15th 2019. The study tools used were calibrated mercury sphygmomanometer to measure the blood pressure, Occupational Stress Index Scoring System was used to measure severity of occupational stress and structural questions socio-demographic data for (age, body mass index, marital state, number of children, number years of work, work hours/week, physician's specialty categories).

Results: The study showed that the prevalence of hypertension was 30%, mean age 37.74 years $\pm$ 6.7 years. High stress level was higher among surgical/anesthetic department. The occurrence of hypertension and age, BMI, marital state, number years of work, work hours/week of the present study showed significant relationship between them but number of children showed inversely relationship.

Conclusions: Nearly two third of participants with high occupational stress had hypertension.

Keywords: Occupational stress, hypertension, female physicians.

Introduction

Occupational stress is a leading cause in development of hypertension (HT).⁽¹⁾ Social-historical patterns suggest that workplace conditions may play an important role in developing of hypertension.^(2,3) The empirical evidence is strongest for job strain, the combination of high psychological demands and low decision-making latitude, act as a risk-factor for hypertension.⁽⁴⁾ Moreover, studies have shown that women are more likely than men to have low decision making latitude and high strain jobs.^(5,6)

However, the effect of exposure to job stress upon blood pressure (BP), while observed in some studies,⁽⁷⁾ blood pressure (BP) elevations have been reported during particularly in hard work conditions such as 24 hour or night-shifts in the emergency room, compared to less strenuous periods.⁽⁷⁾

These findings underscored the special etiological importance of occupational stressors in the progression from hypertension to ischemic heart disease (IHD) and highlight the urgency of finding more effective plans to prevent hypertension among male and female health professionals. A focus on female physicians, whom society is becoming increasingly dependent and who appear to be

at increased risk for other work stress related diseases, such as burnout.⁽⁸⁾

Occupational Stress Index (OSI) questionnaire was used in order to compare females physicians with and without diagnosed hypertension.⁽⁹⁾

The prevalence of hypertension among Erbil city populations was 54.7 %.⁽¹⁰⁾ This prevalence is much higher than the prevalence reported by the study conducted in Nasiriyah city, Iraq in 2014 which was 26.5%⁽¹¹⁾. Studies conducted in neighbouring countries had also shown a high prevalence of hypertension ranging from 32.3% in Jordan,⁽¹²⁾ to 44% in Turkey.⁽¹³⁾

Subjects and Methods

Cross sectional study with analytic element conducted at Baghdad and Al-Imamein Al-Kadhimaain Medical Cities, from March 15th till August 15th 2019.

The target population of this study was female physicians with or without hypertension. A total number of female physicians was 3100, 20% of them equal to 620 female physicians were included in this study (500 of a total 2500 female physicians in Baghdad Medical City and 120 of a total 600 female physicians in Al-Imamein Al-Kadhimaain Medical City) but 20 of 620

female physicians (3%) were refused the participation in the study, Convenient non-probability Sampling technique had been used to select 20% female physicians in each specialist departments.

All female physicians who were permanent residents and specialists with hypertension were included and all female physicians who were pregnant and females' rotator residents were excluded.

The BP was measured by using a calibrated mercury sphygmomanometer whose size was appropriate to right arm circumference, with the patient sitting after ≥ 5 minutes rest. . Hypertension was diagnosed when mean levels of the three separate clinic measurements ≥ 130 mmHg systolic or ≥ 80 diastolic.⁽¹⁴⁾The questionnaire formed designed by the researcher and supervisor after reviewing the related studies.⁽¹⁵⁾

The questionnaire encompassed: Socio-demographic data by herself-reported which included: Age, marital state (single, married, divorced, widow), number of children, number years of works, work hours/week, BMI level calculated from weight and height reported by herself. Each participant was asked when she last weighed herself.

The physicians categorized in to three departments as: (1) surgical and anesthetic department (2) non-surgical clinical-care department (3) diagnostic/ preventive (such as radiologists and pathologists) department.

Occupational Stress Index (OSI) score,⁽⁹⁾ Comprised 46 questions to evaluate the occupational stress level answered by study participants.

The true keyed items were rated as 5 for absolutely true, 4 for almost true, 3 for partial true, 2 for partially false and 1 for absolutely false while the false keyed items were rated as reversed. If the score was below 115, the occupational stress was in a low level, if the score was between 116 and 161, the occupational stress was in a moderate level, and if the score was above 161, the occupational stress was in a high level.⁽⁹⁾

Results

Distribution of hypertension among female physicians was 30% in figure 1.

Table 1: Some socio-demographics characteristics of the study sample showed that more than third 38% of female physicians aged 28-33 years. The mean age was 37.74 years

± 6.7 years. About 41.7% of the study samples were currently married; 13.3% were widows and 6.7% were divorced. About 37.5% worked <10 years and 35% worked >20 years. 45.7% of the participants worked >40 hours/ week.

In addition, about 44.7% of participants had normal weight, 15% were obese and 33% were overweight. Distribution of categorical variables showed that less than half of participants (43.3%) were working in surgical/anesthetic department and less than one quarter of participants 17.5 % were as diagnostic/preventive category and the rest 39.2% were as non-surgical clinical care department.

Figure 2: Shows that near half 47.6% of female physicians who had no children presented with hypertension.

Table 2: Shows that Hypertension was highest among female physicians 50.8% aged 40-45 years and there was significant association between hypertension and age. Also, hypertension was found higher 75% among divorced female physicians and there was significant association between hypertension and marital state. Hypertension was 47.6% among nulliparous and 66.4% in multiparous female physicians and there was no significant association found between hypertension and parity. Regarding BMI level, hypertension was highest among participants who were obese 91.1% and there was significant association found between BMI level and hypertension. Hypertension was found in 46.7% of participants who were work for >20 years and there was significant association between hypertension and number years of work. Hypertension was highest among participants who were work >40 hours/week 37.9% compared to 10% of participants were work <30 hours/week and there was statistical significant association between hypertension and work hours/week. . Moreover, hypertension was highest among surgical/anesthetic department 46.1% than non-surgical clinical care department 16.2% and diagnostic/preventive department 19% which was significant statistically.

Table 3 shows that hypertension was highest among female physicians with high level of occupational stress 71.8% and there was significant association between level of occupational stress in OSI score and hypertension.

Table 1: Distribution of study sample by certain Socio-demographic and health characteristics

Variables		Percentage (%)
Age (years)		
28-33	228	38.00
34-39	134	22.33
40-45	130	21.66
46-51	108	18.00
BMI (kg/m²)		
underweight (<18.5)	44	7.3
normal weight (18.5-24.9)	268	44.7
overweight (25-29.9)	198	33.0
obesity (>30)	90	15.0
Marital state		
single	230	38.3
married	250	41.7
widow	80	13.3
divorced	40	6.7
Number years of work		
<10	225	37.5
10-20	165	27.5
>20	210	35.0
work hours/week		
<30	160	26.7
30-40	166	27.7
>40	274	45.7
Categorical variables		
Surgical/anesthetic department	260	43.3
Non-surgical clinical care department	235	39.2
Diagnostic/preventive department	105	17.5

Table 2: Distribution of the study groups (hypertension and non-hypertension) with Socio-demographic and health characteristics

Variables	Group with hypertension (n=178)		Group without hypertension (n=422)		Total (n=600)		X ²	P-value
	No.	%	No.	%	No.	%		
Age(years)							124.085	0.00001
28-33	8	3.5	220	96.5	228	38.00		
34-39	54	40.3	80	59.7	134	22.33		
40-45	66	50.8	64	49.2	130	21.66		
46-51	50	46.3	58	53.7	108	18.00		
BMI (kg/m²)							285.787	0.00001
underweight (<18.5)	0	0.0	44	100	44	7.33		
normal weight (18.5-24.9)	10	3.7	258	96.2	268	44.66		
overweight (25-29.9)	86	43.4	112	56.6	198	33.00		
obesity (>30)	82	91.1	8	8.8	90	15.00		
Marital state							110.299	0.00001
single	18	7.8	212	92.1	230	38.33		
married	105	42.0	145	58.0	250	41.66		
widow	25	31.3	55	68.8	80	13.33		
divorced	30	75.0	10	25.0	40	6.66		
Number of children*							3.394	0.183
none	20	47.6	22	52.4	42	7.00		
1-3	75	33.1	151	66.8	226	37.66		
>3	34	33.3	68	66.7	102	17.00		
Number years of work							118.038	0.00001
<10	8	3.6	217	96.4	225	37.50		
10-20	72	43.6	93	56.3	165	27.50		
>20	98	46.7	112	53.3	210	35.00		
work hours/week							40.894	0.00001
<30	16	10	144	90	160	26.66		
30-40	58	34.9	108	65.0	166	27.66		
>40	104	37.9	170	62.0	274	45.66		
Categorical variables							60.1	0.00001
Surgical/ anesthetic department	120	46.1	140	53.8	260	43.3		
Non-surgical clinical care department	38	16.2	197	83.8	235	39.2		
Diagnostic/ preventive department	20	19.0	85	80.9	105	17.5		

*(Group with hypertension n=

Table 3: Distribution of the study groups (hypertension and non-hypertension) by level of occupational stress

Level of occupational stress	Group with hypertension (n=178)		Group without hypertension (n=422)		Total (n=600)		X ²	P-value
	No.	%	No.	%	No.	%		
Low (n=125)	0	0.0	125	100	125	20.8	215.8	0.00001
Moderate (305)	56	18.3	249	81.6	305	50.8		
High (170)	122	71.8	48	28.2	170	28.3		

Pie Chart

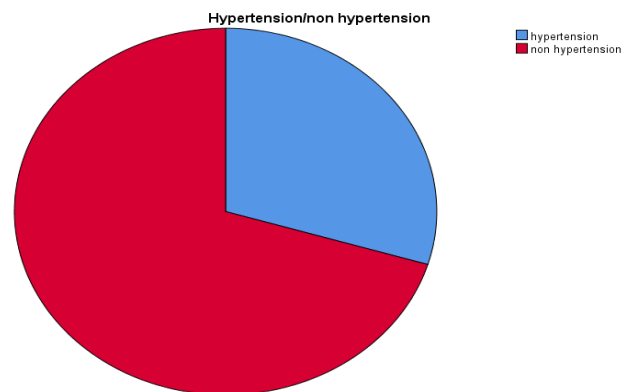


Figure 1: Distribution of hypertension among female physicians

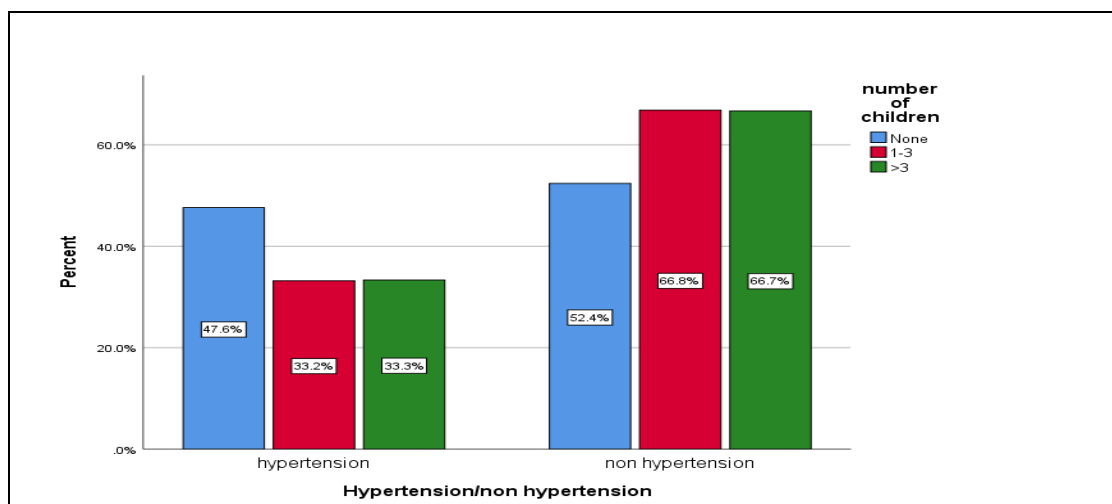


Figure 2 : Distribution of the study groups with or without hypertension by number of children

Discussion

Stress related to occupational satisfaction and work environments among physicians in Iraq and has three main findings.⁽¹⁶⁾ First, safety and work environments are major concerns among physicians in Iraq. Second, lower job satisfaction is associated with higher levels of stress and depression. Third, the following factors are also related to higher levels of stress lower satisfaction with resources, fewer work hours and sleep problems.⁽¹⁶⁾

As previously reported, the total burden of work stress assessed by the OSI showed a significant association with hypertension among Novi Sad female physicians. Thus, in the pathway to hypertension, occupational stress play an important role.⁽¹⁵⁾

The current study had shown that hypertension was highest in the age group >40 years, the occurrence of hypertension differs among age groups. The study agreed with a study in China about there was significant association between hypertension and age, that show there were differences in the occurrence of hypertension among different age groups.⁽¹⁷⁾

The prevalence of hypertension was higher in obese participants which was similar to that results obtained by a study conducted in Iraq shown that body weight above normal BMI has positive relation with hypertension.⁽¹⁸⁾ This study agreed with other studies that shown the overweight status was demonstrated to be an independent risk factor for hypertension, which was consistent with previous studies showing an association between high body fat levels and hypertension.^(19,20)

The study was shown that the hypertension was found more in divorced than in a married and widow female physicians and less among single female physicians and agreed with study done in Iraq.⁽¹⁾ The number of children did not differ between physicians with or without hypertension; we included marital status as a covariate, thereby striving to account for home and family obligations and blood pressure was found higher among participants worked >20 years and less in <10 years of work and these were agreed with study in Novi Sad showed that the hypertension was more in physicians who work >30 years and less in those who work <10 years.⁽¹⁵⁾

Hypertension was found higher among female physicians who work >40 hours/week than those who work <30 hours/week and there was a significant association between prevalence of hypertension and long work hours/week.

Americans work longer hours than workers in most European countries, including the United Kingdom, Sweden, and Germany.^(21,22) Average work hours of Americans even exceeded Japanese workers in recent years.⁽²²⁾

Conclusions

Prevalence of hypertension was occurred in 30% of female physicians, nearly two third of female physicians with a high level of occupational stress had hypertension and approximately nearly one quarter of them with moderate level of occupational stress had hypertension and there was significant association found between occupational stress and hypertension among female physicians in each specialist departments.

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