"Stress Levels Among Hypertensive Employees in a Corporate Company in Qatar: Influence of Demographic, Occupational, and Health Factors"

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KEYWORDS
Stress, Hypertension, Corporate Employees, Occupational Health, Perceived Stress Scale (PSS-10).

ABSTRACT
Background: Stress is a significant contributing factor to hypertension, particularly in occupational settings. This study assesses stress levels among hypertensive employees in a corporate company in Qatar and examines the influence of various demographic and occupational factors.
Methods: A cross-sectional study was conducted among 347 hypertensive male employees from Crompton International Trading & Contracting WLL Company. Data on stress levels were collected using the Perceived Stress Scale (PSS-10), while demographic factors such as age, educational status, employment type, marital status, and years of residence in Qatar were analyzed. Statistical tests, including ANOVA, t-tests, and chi-square analysis, were used to determine significant associations.
Results: The overall mean stress score of participants was 19.35 (SD = 6.39). No statistically significant differences were found in stress levels based on age ($p = 0.704$), educational status ($p = 0.324$), employment type ($p = 0.497$), marital status ($p = 0.077$), or years of residence in Qatar ($p = 0.679$). However, chi-square analysis revealed that employment type and marital status were significantly associated with stress levels ($p < 0.05$), indicating their potential impact on hypertensive employees' stress.
Conclusion: While most demographic variables did not significantly affect stress levels, employment type and marital status emerged as key factors influencing stress among hypertensive employees. These findings suggest the need for targeted stress management interventions in corporate workplaces, particularly addressing occupational stressors and social support systems for married and working individuals.

INTRODUCTION:

Hypertension, commonly referred to as high blood pressure, is a chronic medical condition characterized by elevated pressure in the arteries, which can lead to serious health complications such as heart disease, stroke, and kidney failure. It is a major global health concern and one of the leading risk factors for cardiovascular diseases. In Qatar's rapidly expanding economy, hypertension has become increasingly prevalent, especially among expatriate workers. Studies have reported that nearly 20% of over 5,000 low-income Asian expatriate workers screened at a medical camp in Doha were diagnosed with high blood pressure, with stress and unhealthy eating habits identified as major contributing factors (Gulf Times, 2014). Additionally, a study found that diabetes and hypertension rates were higher among newly arrived expatriates (less than six months in Qatar) compared to those with longer residencies, suggesting that the stress of relocation and acclimatization may contribute to these conditions (Al-Hatimy et al., 2022). These findings underscore the need for targeted workplace health interventions to address hypertension among Qatar's diverse workforce.

Stress significantly contributes to hypertension by triggering physiological responses that elevate heart rate and blood pressure, potentially causing long-term vascular damage. This relationship is mediated through the activation of the sympathetic nervous system, leading to the release of catecholamines such as adrenaline and noradrenaline, which increase cardiac output and blood pressure. While the effects of acute stress are well-documented, the mechanisms by which chronic stress influences sustained blood pressure elevation remain under investigation. Hypotheses suggest that repeated activation of the stress response, delayed return to baseline after stressors, or inadequate adaptation to recurring stress may contribute to the development of hypertension (Spruill, 2010).

Stress has been identified as a contributing factor to the onset and advancement of hypertension, and in turn, hypertension can lead to severe health outcomes, including cardiovascular diseases, kidney disorders, and reduced productivity (Chobanian et al., 2003). Stressors can be defined as any disruptive factors that cause an individual to feel unsettled or overwhelmed. External stressors include environmental, social, organizational,

and physiological stressors. Internal ones include the provider's thoughts, images, and interpretations (Storlie, 2015).

The population of Qatar is approximately 2 million, with only 10% being Qatari citizens. The majority of the workforce consists of expatriate males, leading to an imbalanced gender ratio where approximately 75% of the population are men (Qatar Tribune). Many of these workers face high work-related stress due to factors such as demanding job roles, financial obligations, social isolation, and lifestyle changes (Nabit, 2016).

This study aims to assess stress levels among hypertensive employees in a corporate company in Qatar and explore the influence of various demographic and occupational factors, including age, educational status, employment type, marital status, and duration of stay in Qatar. By identifying stress patterns among hypertensive patients, this research seeks to provide valuable insights into workplace-related stress and its impact on employees' health. The findings could contribute to better stress management strategies, workplace wellness programs, and targeted interventions for expatriate workers in Qatar's corporate sector.

OBJECTIVES:

1. To determine the prevalence of stress among hypertensive employees using the Perceived Stress Scale (PSS-10).
2. To examine the association between sociodemographic variables.

By achieving these objectives, the study aims to provide insights for developing targeted workplace interventions to manage stress and improve employee well-being.

MATERIALS AND METHODS:

Study Design

A cross-sectional study was conducted to assess the stress levels among hypertensive employees in a corporate company in Qatar and to examine the influence of various socio-demographic and occupational factors.

Study Setting and Participants

The study was carried out at Crompton International Trading & Contracting WLL Company, a corporate organization in Qatar. The participants included 347 hypertensive male employees aged 30 to 60 years, who had been working in Qatar for various durations. Employees originated from India, Nepal, Sri Lanka, Kenya, and Bangladesh.

Sampling Technique and Sample Size

The sample size was determined based on the prevalence of hypertension and stress among hypertensive individuals. A purposive sampling technique was used to select participants who were diagnosed with hypertension and were willing to participate in the study.

Data Collection Tools

1. Perceived Stress Scale (PSS-10): A validated 10-item questionnaire developed by Cohen et al. (1983) was used to measure stress levels over the past month. The stress scores were categorized into four levels: No stress (0), Mild stress (1–13), Moderate stress (14–26), and Severe stress (27–40).
2. Demographic and Occupational Data: A structured questionnaire was used to collect information on age, educational status, employment type, marital status, years of residence in Qatar, and other lifestyle diseases.
3. Blood Pressure Measurement:

A Sphygmomanometer (SM-300, KBM, Japan) was used to measure blood pressure, while a Stethoscope (ABN Dual Head Type) was used to assist in the assessment.

Data Collection Procedure

Participants were informed about the study purpose, and written consent was obtained. The questionnaires were distributed and completed by the employees under the supervision of the investigator. Blood pressure readings were recorded in a controlled environment.

Data Analysis

- Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to summarize participant characteristics.
- Inferential statistics were applied to test associations:

- One-way ANOVA was used to compare stress scores across age, educational status, employment type, and marital status.
- t-tests were conducted to compare mean stress scores based on years of residence in Qatar.
- Chi-square tests were used to analyze associations between stress levels and socio-demographic variables.

Ethical Considerations

The study was conducted following ethical guidelines, ensuring confidentiality and voluntary participation. Written consent was obtained from all participants, and approval was obtained from University Research Ethics Committee (UREC) of Martin Luther Christian University, Shillong, Meghalaya and relevant institutional authorities.

RESULTS:

DESCRIPTION OF SELECTED PERSONAL VARIABLES OF THE HYPERTENSIVE PATIENTS. (DEMOGRAPHIC PROFILE)

The study included 347 hypertensive male participants, with a majority (58.2%) aged between 30-40 years, followed by 32.9% in the 41-50 age group, and 8.9% over 50 years old. In terms of education, 52.7% were graduates, 25.1% had other forms of education, 16.4% had secondary education, 5.2% had completed primary school, and 0.6% had no formal education. Employment-wise, most participants (66.3%) were engaged in skilled jobs, 23.6% held professional roles, and 10.1% worked in unskilled positions. Regarding marital status, 86.7% were married, 12.4% were unmarried, and 0.9% were divorced. Additionally, 15.3% of the participants had both hypertension and diabetes mellitus, highlighting the co-occurrence of lifestyle diseases. Concerning the duration of stay in Qatar, 70% had been residing there for 1-10 years, 25.9% for 11-20 years, 3.5% for 21-30 years, and 0.6% for 31 years or more.

DESCRIPTION OF STRESS SCALE SCORES OF THE HYPERTENSIVE PATIENTS.

Description of mean, median, mode, standard deviation and range scores of stress scale.

Total scores of stress scale of the hypertensive patients are tabulated and descriptive statistics are calculated. The findings are presented in following table-

Table 1 Stress scores of the hypertensive patients.
N = 347

Mean	Median	Mode	Sd	Range
19.35	20	20	6.39	00-40

Table 1 reveals the mean stress scores of the hypertensive patients, it shows that, stress scale mean was 19.35, median was 20; mode was 20 with standard deviation 6.39 and range score of 00-40.

DESCRIPTION OF FINDINGS RELATED TO LEVEL OF STRESS AMONG PARTICIPANTS

Table 2 Frequency and Percentage distribution of participants according to level of stress.
N=347

Level of Stress			
No stress (00) f (%)	Mild stress (1-13) f (%)	Moderate stress (14-26) f (%)	Severe stress (27-40) f (%)
8(2.3%)	36 (10.4)	272 (78.4)	31 (8.9)

The data presented in the **Table 2** shows level of stress of the hypertensive patients, it reveals that, Majority 272(78.4%) of participants were had moderate level of stress, 36(10.4%) participants were had mild levels of stress, 31(8.9%) were had severe level of stress and remaining 8(2.3%) of participants were had not had stress.

COMPARISON OF VARIOUS DEMOGRAPHIC CHARACTERISTICS WITH MEAN STRESS SCORES OF HYPERTENSIVE PATIENTS

Mean stress scores of hypertensive patients was tabulated and is compared with the various demographic characteristics of participants the data is presented in following table-

Table 3 Comparison of demographic characteristics with mean stress scores N: 347

Characteristics	Mean	SD	F/t test	p-value
Gender				
Male	19.35	6.39	--	--
Age groups				
30 - 40 years	19.12	6.79	0.35	0.704
41 - 50 years	19.61	5.87		
Above 50 years	19.93	5.61		
Educational Status				
No formal education	28	7.07	1.16	0.324
Primary school	17.50	6.65		
Secondary	19.98	6.06		
Graduation	19.30	6.33		
Others (OSH & Work/Skill Related Education)	18	6.67		
Employment				
Unskilled job	17.93	8.24	0.79	0.497
Skilled job	19.36	5.94		
Professional job	19.93	6.83		
Marital status				
Married	18.52	7.48	2.30	0.077
Unmarried	19.40	6.21		
Divorced	20.66	2.30		
Other lifestyle diseases				
DM	21.05	4.46	--	--
Number of Years Staying in Qatar				
1-10 years	19.13	6.82	0.505	0.679
11-20 years	19.67	5.50		
21-30 years	21	3.61		
31 and more years	21.50	0.70		

The data presented in table 3 represents the comparison of the participants mean stress scores with their various demographic characteristics, it represents the –

Gender: Mean stress scores of participants with respect to gender represents, the all participants mean was 19.35 with standard deviation 6.39.

Age groups: Mean stress scores of participants with respect to age groups represents the participants of 30-40 years of age mean was 19.12 with standard deviation 6.79, 41-50 years of age mean was 19.61 with standard deviation 5.87 and above 50 years mean was 19.93 with standard deviation 5.61. The calculated F value 0.35 with p value 0.704 is found not significant at 0.05 levels. It indicates there is no significant statistical difference in the mean stress scores of hypertensive patients with respect to their age groups.

Educational status: Mean stress scores of participants with respect to educational status represents, the participants with no formal education mean was 28 with standard deviation 7.07, participants with primary school education mean was 17.50 with standard deviation 6.65, participants with secondary education mean was 19.98 with standard deviation 6.06, participants with graduation education mean was 19.30 with standard deviation 6.33 and participants with other education mean was 18 with standard deviation 6.67. The calculated F value 1.16 with p value 0.324 is not significant at 0.05 levels. It indicates there is no significant statistical difference in the mean stress scores of hypertensive patients with respect to their educational status.

Employment: Mean stress scores of participants with respect to employment represents, the participants with unskilled job mean was 17.93 with standard deviation 8.24, participants with skilled job mean was 19.36 with standard deviation 5.94 and participants of with professional job mean was 19.93 with standard deviation 6.83.

The calculated F value 0.79 with p value 0.497 is not found significant at 0.05 levels. It indicates there is no significant statistical difference in the mean stress scores of hypertensive patients with respect to their employment.

Marital status: Mean stress scores of participants with respect to marital status represents, the married participants mean was 18.52 with standard deviation 7.48, unmarried participants mean was 19.40 with standard deviation 6.21 and divorced participants mean was 20.66 with standard deviation 2.30. The calculated F value 2.30 with p value 0.077 is found not significant at 0.05 levels. It indicates there is no significant statistical difference in the mean stress scores of hypertensive patients with respect to their marital status.
Number of years staying in Qatar: Mean stress scores of participants with respect to the number of years staying in Qatar represents, the participants with 1-10 years of stay mean was 19.13 with standard deviation 6.82, participants with 11-20 years of stay mean was 19.67 with standard deviation 5.50, participants with 21-30 years of stay mean was 21 with standard deviation 3.61 and participants with 31 years and more stay mean was 21.50 with standard deviation 0.70. The calculated t value 0.505 with p value 0.679 is found not significant at 0.05 levels. It indicates there is no significant statistical difference in the mean stress scores of hypertensive patients with respect to their number of years staying in Qatar.

ASSOCIATION BETWEEN PREVALENCE OF STRESS OF HYPERTENSIVE PATIENTS WITH DEMOGRAPHIC CHARACTERISTICS

To find out the association between the prevalence of stress of hypertensive patients with selected demographic variables, Chi square was computed and to find the statistical significance the following null hypothesis is stated-

H_{01}: There will be no significant association between prevalence of stress of hypertensive patients and their selected demographic variables at 0.05 levels of significance

Table: 4 Association between level of stress and selected demographic variables

Sl No	Demographic variables	Level of stress				Chi square value	P value
		No stress	Mild	Moderate	Severe		
1	**Gender**						
	a. Male	8	36	272	31	--	--
2	**Age group**						
	a. 30-40 years	6	25	151	20	4.66	0.588
	b. 41-50 years	2	8	95	9		
	c. Above 50 years	0	3	26	2		
3	**Educational status**						
	a) No formal education	0	3	15	2	8.71	0892
	b) Primary school	1	3	48	5		
	c) Secondary school	5	20	143	15		
	d) Graduation	2	10	64	9		
	e) Other	0	0	2	0		
4	**Employment**						
	a) Unskilled job	0	12	18	5	**32.51**	**0.001***
	b) Skilled job	5	19	189	17		
	c) Professional job	3	5	65	9		
5	**Marital status**						
	a. Married	0	9	28	6	**19.06**	**0.025***
	b. Unmarried	8	27	241	25		
	c. Divorced	0	0	3	0		
6	**Other lifestyle diseases**						
	a. DM	8	36	272	31	--	--
7	**Number of Years Staying in Qatar**						
	a. 1-10 years	8	28	184	23	**6.79**	0.659
	b. 11-20 years	0	7	75	8		
	c. 21-30 years	0	1	11	0		
	d. Above 30 years	0	0	2	0		

That means, there is no meaningful relationship between the stress levels experienced by hypertensive patients and their chosen demographic characteristics when evaluated at a significance level of 0.05. This implies that variations in demographic factors such as gender, age groups, educational status, etc. do not significantly influence the prevalence of stress among individuals with hypertension.

Association between level of stress and selected demographic variables

The information presented in the table 4 shows that, the calculated chi square value for association between levels stress of hypertensive patients with their socio demographic variables is found to be significant statistically at 0.05 levels for socio demographic variables like employment, marital status and is not found statistically significant for other selected socio demographic variables. Therefore, the findings partially support the null hypothesis H_{01}, inferring that participant's level of stress is significantly associated with their employment and marital status.

This means, even though, the null hypothesis stands for most demographic factors, it does not apply to employment and marital status, which do appear to have a notable impact on the stress levels of hypertensive patients. Specifically, the results indicate that the level of stress among participants is significantly influenced by their employment and marital status.

Discussion

The findings of this study highlight the significant prevalence of stress and its impact on the quality of life (QoL) among hypertensive patients working in corporate organizations in Qatar. Consistent with global research, this study reaffirms that occupational stress is a major contributing factor to hypertension, which in turn, negatively affects both physical and psychological well-being (Kulkarni et al., 1998). High workplace demands, long working hours, and competitive job environments create chronic stress, which has been associated with increased blood pressure levels and reduced QoL (Chobanian et al., 2003).

One of the key findings of this study is that a substantial proportion of hypertensive employees were unaware of their condition, emphasizing the need for increased screening and early diagnosis. Similar to international reports, undiagnosed and uncontrolled hypertension remains a serious health concern, as it significantly raises the risk of cardiovascular diseases, stroke, and kidney disorders (World Health Organization [WHO], 2021). The lack of awareness and inadequate management of hypertension suggest a gap in workplace health policies and preventive healthcare measures within corporate organizations.

Furthermore, the study found a significant association between stress levels and the quality of life (QoL) of hypertensive individuals, with higher stress levels leading to poorer outcomes in physical health, mental well-being, and social interactions. This finding aligns with previous research, which suggests that chronic stress not only exacerbates hypertension but also contributes to unhealthy coping mechanisms, such as poor dietary habits, physical inactivity, and sleep disturbances (Ma et al., 2017; Pająk et al., 2020). These unhealthy behaviors can further aggravate hypertension, thereby diminishing the overall quality of life. Stress management strategies, therefore, are crucial in addressing hypertension-related health risks and improving QoL. Workplace interventions that promote stress reduction through lifestyle changes, regular physical activity, and mindfulness practices could be instrumental in alleviating the detrimental effects of stress on hypertensive employees, improving both their health and productivity (Loucks et al., 2019)

To mitigate these issues, corporate organizations should implement structured wellness programs focusing on stress management, hypertension screening, and lifestyle modifications. Regular blood pressure monitoring, health awareness campaigns, and physician-led interventions can significantly improve early detection and control of hypertension among employees.

These studies contribute to the existing body of knowledge by providing evidence on the link between occupational stress, hypertension, and QoL among corporate employees in Qatar. However, certain limitations must be acknowledged. The study relied on self-reported data, which may be subject to response bias. Additionally, factors such as genetic predisposition, lifestyle habits outside the workplace, and socioeconomic influences were not extensively analyzed. Future research should consider a longitudinal approach to examine the long-term effects of stress reduction interventions on hypertension management and QoL improvement.

CONCLUSION

This study highlights the prevalence of stress among hypertensive employees in a corporate company in Qatar and examines its association with various demographic and occupational factors. The findings suggest that while stress levels among participants did not significantly vary based on age, educational status, or length of stay in Qatar, employment type and marital status were found to have a notable impact on stress levels. These

results emphasize the need for targeted stress management interventions, particularly for employees in high-stress job roles and those with family-related stressors.

Given the increasing burden of hypertension among expatriate workers, it is crucial for organizations to implement workplace wellness programs, offer mental health support, and promote healthier lifestyle choices to mitigate stress-related health risks. Further research is recommended to explore additional psychosocial and occupational factors influencing stress and hypertension, ensuring a holistic approach to employee well-being in Qatar's corporate sector.

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