

Relationship Between Occupational Stress Dimensions and Sickness Absence Among a Gas Company Employees

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Abstract

Background: Working conditions have considerably changed and exposure to psychosocial risk factors, particularly occupational stress, has recently had an increasing trend. Studies have shown that sickness absence was the worst outcome of occupational stress. The present study aimed to assess the relationship between dimensions of occupational stress and sickness absence in a gas company in Boushehr, Iran.

Methods: This cross-sectional study was conducted on 400 employees of a gas company, Boushehr, Iran who were selected through random sampling. Osipow occupational stress questionnaire was used to determine the participants' stress levels. Then, the data were analyzed using descriptive statistics and Kruskal-Wallis test.

Results: The participants' mean of sickness absence was 2.164.57± days per year. Besides, 1.5%, 32.5%, 36.3%, and 29.8% of the participants had low, low to moderate, moderate to severe, and severe occupational stress, respectively. Additionally, the mean of total stress was moderate to severe among the study participants. This was also the case concerning the stress dimensions. The results revealed a significant relationship between the number of sickness absences and dimensions of occupational stress, including workload, role insufficiency, role conflict, responsibility, physical environment, and total stress (P=0.0001).

Conclusion: The majority of the employees had high levels of occupational stress. Besides, a significant association was observed between the dimensions of occupational stress and sickness absence. Accordingly, to decrease the number of sickness absence, we should take measures to reduce occupational stress.

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Introduction

Occupational stress occurs in case individuals' capacities and capabilities do not meet job requirements.¹ In the past decades, work conditions have been considerably changed and psychosocial risk factors, particularly occupational stress, have increased.²

Based on the report provided by the American Psychological Association (2009), 69% of the working

population mentioned their jobs as the main source of stress, 41% stated that they usually experienced stress during their workdays, and 51% declared that stress reduced their efficiency.³ In general, occupational stress is one of the factors with adverse impact on health, efficiency, occupational accident, job change, sickness absence, and increase in physical and mental damages.^{4,5}

Sickness absence is considered as a health index

and statistics have indicated that this issue is increasing in industrial countries.⁶ The employees' number of absences increases the expenses in organizations and industries in two ways: 1- cost of substitution for absent workers and 2- reduction of production, which results in efficiency decrement.⁷

In the recent years, much attention has been paid to psychosocial working conditions as a risk factor for sickness absence. Although some studies have focused on job satisfaction,⁸ others have investigated occupational stress as a potential risk factor for sickness absence.⁹

Kerr et al. (2009) pointed out that sickness absence, job change, and early retirement were the worst outcomes of occupational stress.¹⁰ Additionally, Trybou et al. reported that long-term sickness absence was 2.26 folds higher among the individuals who experienced high levels of occupational stress compared to others.¹¹ However, Ryu et al. conducted a study on railway workers and found no relationships between occupational stress and sickness absence.¹² On the other hand, Vahtera et al. demonstrated that psychosocial factors were among the risk factors of sickness absence and that reduction of social support and increase of job requirements increased the number of sickness absences by 1.3 and 1.1 folds, respectively.¹³

Gas Company is one of the largest and most important industries with a large number of workers in Iran. Considering the negative effects of occupational stress on employees' physical and mental health and occupational performance, large number of employees in Gas Company, and criticality, risks, and socioeconomic importance of this industry, studying occupational stress and employing strategies for reduction of its undesirable effects are of great importance.^{14,15} Therefore, the present study aimed to assess the relationship between dimensions of occupational stress and sickness absence in a gas company in Boushehr (Iran).

Materials and Methods

Study Population and Sample Selection

This cross-sectional study was conducted on 400 employees of Boushehr Gas Company with at least one year of job experience in 2014. The sample size was determined using the formula of:

$$n = \frac{\{Z_{1-\alpha/2}^2 \times p(1-p)\}}{d^2}$$

and considering 18% prevalence of sickness absence taken from previous study⁶ and 5% error limit, we estimated the sample size to be 400 individuals. The study participants were selected through random

sampling. Samples were randomly selected from the corresponding personnel list provided by the company. The exclusion criteria of the study were psychological disorders and having less than one year of job experience. The data about the employees' sickness absence in the past one year, job experience, and physical and mental disorders were extracted from the records. It should be noted that all of the subjects signed an informed consent form before participating in the study. The study protocol was reviewed and approved by ethics committee of Shiraz University of Medical Sciences (No. 2015-276).

Measures

The study data were collected using two questionnaires, namely demographic characteristics and Osipow occupational stress questionnaire.

Demographic Characteristics

The participants completed the demographic questionnaire containing questions about age, sex, height, weight, educational level, marital status, number of children, job tenure, second job, shift working, and type of employment.

Osipow Occupational Stress Questionnaire

This 60-item questionnaire measures occupational stress. Every 10 item of this questionnaire determines one dimension of occupational stress. The dimensions include role overload, role ambiguity, role insufficiency, role boundary, responsibility, and physical environment. The first five dimensions include 50 items responded through a 5-point Likert scale ranging from never (1) to most often (5). The sum of scores of each 10 item is used to assess the effect of each stress dimension and the sum of scores of all the 50 items is used to evaluate the total stress. The scores of dimensions are classified into four categories, namely mild (10-19), mild to moderate (20-29), moderate to severe (30-39), and severe (40-50). Total stress is also classified into four classes as follows: mild (50-99), mild to moderate (100-149), moderate to severe (150-199), and severe (200-250). The 10 questions in the physical environment dimension are computed and analyzed separately. This dimension is also classified into four grades, namely mild (5-9), mild to moderate (10-14), moderate to severe (15-19), and severe (20-25).¹⁶ According to a study conducted in Iran, the Persian version of this questionnaire has acceptable reliability and validity (Cronbach's alpha = 83%).¹⁷

Statistical Analysis

Descriptive statistics were used for calculation of mean, Standard Deviation (SD), percentage, and frequency. Besides, non-parametric Kruskal-Wallis

test was used to assess the relationship between the number of sickness absences and dimensions of occupational stress. It should be mentioned that normal distribution of the quantitative data was assessed using Kolmogorov-Smirnov test and graphical methods. In the case of non-normal distribution, appropriate statistical tests or non-parametric methods were utilized. All statistical analyses were performed using SPSS statistical software, version 19 and $P < 0.05$ was considered to be statistically significant.

Results

The participants' mean age was 33.18 ± 5.64 years, representing a young population. Besides, their mean job tenure was 6.06 ± 4.99 years. The majority of the participants were male (93.8%) and married (78.8%). Additionally, nearly 59% of the subjects had bachelors and higher degrees and most of them were day workers (80.8%). Also, 88% of them worked for extra hours. The mean number of absences from work in the study population was found to be 2.16 ± 4.57 days per year.

Median and classification of total scores of stress and its subscales is shown in Table 1. Accordingly, 1.5%, 32.5%, 36.3%, and 29.8% of the participants had low, low to moderate, moderate to severe, and severe occupational stress, respectively. Besides, the median of total stress (3) was within the moderate to severe range. This was also the case regarding the stressors subgroups. The results showed the participants' median score to be 3 in "role overload", 3 in "role insufficiency", 4 in "role ambiguity", 3 in "role boundary", 3 in "responsibility", and 3 in "physical environment".

Median and interquartile of sickness absence in different groups based on the dimensions of occupational stress are presented in Table 2. As the Table depicts, a significant association was found between the median of sickness absences and the dimensions of occupational stress, namely "role overload", "role insufficiency", "role ambiguity", "role boundary", "responsibility", and "physical environment", and total stress ($P = 0.0001$).

Discussion

The present study aimed to investigate the relationship between occupational stress and sickness absence among the Gas Company employees. The results revealed high levels of occupational stress and high number of sickness absence among these employees. The results also showed that the dimensions of occupational stress were significantly associated with sickness absence. The results revealed a high number of sickness absences in the study population. This is in agreement with the results of other studies conducted in this field.^{6,18}

Based on the results, the mean of total stress in the study population was within the moderate to severe range. This was also the case regarding the dimensions of occupational stress; including "role overload", "role ambiguity", "role insufficiency", "role boundary", "responsibility", and "physical environment". In other words, the mean scores of these dimensions were also within the moderate to severe range. These results were consistent with those obtained in the study conducted by Hoseinian and Shirazi on post office employees. Their results indicated that the participants' mean score of stress (194.2 ± 37.08) was within the moderate to severe range.¹⁹ Moreover, the highest rate of stress dimensions was related to "role boundary" in the present study. The results of Sharifian et al.'s study on 110 physicians working in the Department of Forensic Medicine, Tehran, Iran demonstrated that 68% of the physicians had low to moderate stress levels and the highest mean score of stress (28.9) was related to "role ambiguity".¹⁷ Besides, in the study performed by Sargent et al. on 46 orthopedic residents in the U.S. and the one conducted by Branco et al. on 162 gynecology residents, "workload" was identified as the main predisposing factor to stress.^{20,21} The difference between the results of these studies and those of our study can be attributed to the difference in the study populations. These studies were performed on health personnel, while ours was performed on Gas Company employees.

One of the main objectives of the present study was assessment of the relationship between sickness

Table 1: Status of job stress dimensions, total stress, and median score of job stress in the study participants (n=400)

Intensity	Role overload	Role insufficiency	Role ambiguity	Role boundary	Responsibility	Physical environment	Total Stress
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Low	14 (3.5%)	16 (4%)	3 (0.8%)	4 (1%)	24 (6%)	18 (4.5%)	6 (1.5%)
Low-moderate	126 (31.5%)	117 (29.3%)	69 (17.3%)	99 (24.8%)	135 (33.8%)	150 (37.5%)	130 (32.5%)
Moderate-severe	160 (40%)	151 (37.8%)	119 (29.8%)	130 (32.5%)	162 (40.5%)	175 (43.8%)	145 (36.3%)
Severe	100 (25%)	116 (29%)	209 (52.3%)	167 (41.8%)	79 (19.8%)	57 (14.3%)	119 (29.8%)
Total	400 (100%)	400 (100%)	400 (100%)	400 (100%)	400 (100%)	400 (100%)	400 (100%)
Median of delay (interquartile range)	3 (2-3.75)	3 (2-4)	4 (3-4)	3 (2-4)	3 (2-3)	3 (2-3)	3 (2-4)

Table 2: Median and interquartile of sickness absence in different groups based on job stress dimensions (n=400)

Independent variable	Status	Sickness absence (days/year)	P value*
		Median of delay (interquartile)	
Role overload	Low	0 (0)	0.0001
	Low-moderate	0 (0)	
	Moderate-severe	1 (2)	
	Severe	3 (7)	
Role insufficiency	Low	0 (0)	0.0001
	Low-moderate	0 (0)	
	Moderate-severe	1 (2)	
	Severe	2 (4)	
Role ambiguity	Low	0 (0)	0.0001
	Low-moderate	0 (0)	
	Moderate-severe	0 (0)	
	Severe	2 (4)	
Role boundary	Low	0 (0)	0.0001
	Low-moderate	0 (0)	
	Moderate-severe	0 (1)	
	Severe	2 (4)	
Responsibility	Low	0 (0)	0.0001
	Low-moderate	0 (0)	
	Moderate-severe	2 (4)	
	Severe	2 (4)	
Physical environment	Low	0 (0)	0.0001
	Low-moderate	0 (0)	
	Moderate-severe	1 (4)	
	Severe	2 (2)	
Total Osipow	Low	0 (0)	0.0001
	Low-moderate	0 (0)	
	Moderate-severe	1 (2)	
	Severe	2 (5)	

*Kruskal- Wallis Test

absence and occupational stress. The results showed that the dimensions of occupational stress were significantly associated with sickness absence. According to the result of the current research, the median of sickness absence was higher among the participants with higher “role overload”, “role insufficiency”, “role ambiguity”, “role boundary”, “responsibility”, and total stress ($P=0.0001$). Therefore, occupational stress was identified as one of the effective factors in sickness absence. Accordingly, the individuals with higher stress levels experienced more sickness absence. These results were in agreement with those of other studies conducted in this field. For instance, the findings of the study performed by Slany et al. on employees in 34 European countries indicated that psychosocial factors, such as occupational stress, were related to long-term sickness absence.²² Bohm et al. also carried out a research on 122 patients who were absent from work due to occupational dermatitis. They reported that occupational stress was effective in sickness absence and chronic stress was one of the predictors of sickness absence.²³ Similarly, Bultmann et al. stated that stress increased the incidence of long-term sickness absence.²⁴ Similarly, Moreau et al. indicated a strong relationship between occupational

stress and short- and long-term sickness absence.²⁵

However, some studies have reached contradictory results. For instance, Ryu et al. performed a study on railway workers and found no significant relationships between occupational stress and sickness absence.¹² Dolatabadi et al. also conducted a research on 51 female and 31 male office workers and revealed no significant correlation between the score of stress and sickness absence.²⁶ The difference between our results and Dolatabadi’s study may be due to the fact that most of the participants in his study had more than 10 years of job experience, enabling them to predict stressors and use appropriate problem-solving strategies for coping with them. In our study, also, the number of sickness absences was higher in the individuals with higher occupational stress levels.

Due to the cross-sectional nature of the current study and self-report methodology used for data collection, the results of this study should be interpreted with caution. Additionally, in the present study the effective factors in sickness absence were evaluated irrespective of work system (shift working vs. day working). Therefore, it is recommended that in the future studies working schedule should be considered.

Conclusion

The results of this study indicated high levels of stress among the employees of Gas Company. Also, a significant relationship was observed between occupational stress and sickness absence, and occupational stress was one of the effective factors in sickness absence. In other words, as the individuals' stress levels increased, the number of their sickness absences increased, as well. Hence, the employees' stress level has to be controlled and minimized in order to reduce the sickness absence in the workplace.

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