

## ORIGINAL ARTICLE

# OCCUPATIONAL STRESS AMONG WHITE COLLAR EMPLOYEES IN ESFAHAN STEEL COMPANY, IRAN

Masoud Lotfizadeh<sup>1</sup>, Namaitjiang Maimaiti<sup>2</sup>, Noor Hassim Ismail<sup>3</sup>

<sup>1</sup>Department of Community Health, Shahrekord University of Medical Sciences, Iran,

<sup>2</sup>International Institute for Global health, United Nations University

<sup>3</sup> Department of Community Health, Faculty of Medicine, UKM

## ABSTRACT

Occupational stress is one of the major health hazards among blue and white-collar workers. However there is no data on occupational stress among white-collar workers in Iran. Aim of this study was to investigate occupational stress among white collar employees in Esfahan Steel Company organization (ESCO), Iran. A cross-sectional survey was conducted through face to face interview using validated standardized questionnaire on occupational stress among 200 white-collar workers from ESCO who agreed to participate in the study, the response rate of participation was 100%. The logistic regression test was used to determine significant associated factors of occupational stress among the study sample. It is found that among the six items measuring source of stress, the highest source of stress related to economic problem, 117 (59.7%). The statistical analysis showed sources of stress such as task type ( $p=0.0001$ ), economic problem ( $p=0.0001$ ), work environment ( $p=0.0001$ ) and children problem ( $p=0.05$ ) were significantly associated with having stress among the workers. We found that around half of the white collar workers were under stress at ESCO. Main sources of the occupational stress of white colour workers related to their work environment, economic problem; task type, and related their children.

**Key words:** Occupational stress, White-collar, Esfahan, Steel Company, ESCO, Iran.

## INTRODUCTION

Occupational stress is one of the major health hazards of workplace. It accounts for much of the physical illness, substance abuse, and family problems experienced by millions of blue and white-collar workers. Operational employees are blue-collar workers who do the manual job of producing steel while non-operational employees are the white-collar workers who do the office work including managers. Occupational stress and stressful working conditions have been linked to low productivity, absenteeism, and increased rates of accidents on and off the job<sup>1</sup>. Since 1960s, occupational stress has been associated with worker alienation, job dissatisfaction, mental health problems, concerns originating from the Industrial Revolution, mass production technologies, and the re-design of jobs. Mass production methods and advent of scientific management principles at the end of the 19th century led to the simplification and fragmentation of jobs into highly repetitive and routine tasks, and the treatment of workers as commodities<sup>2</sup>.

According to WHO<sup>3</sup>, workers in different countries have the right to healthy and safe work to a work environment that enables them to live in a society and economically productive life. In spite of this opinion, work-related stress is a matter of growing concern in developing countries, as it will inevitably have future negative consequences for the health and safety of workers and the productivity and cost-effectiveness of the companies they work for. Furthermore, increasing globalization and unhealthy work practices and unsafe technology make stress easily become a great challenge and require dedicated employers and worker in the last two decade. However, in developing countries most people may lack knowledge about stress, and are not aware of the importance of dealing with work-related stress. WHO (2007), also estimated that overall only 5-10% of the workers in developing countries and finally half of the workers in developed countries have access to enough health services.

Regarding to the International Labour Organization, World Health Organization

proponents to work stress is recognized world-wide as a major challenge to worker health and the healthiness of their organization. Furthermore, WHO believes workers who are stressed also are more likely to be unhealthy, poorly motivated, less productive and less safe at work. Their organizations are less successful in a competitive market. Generally, stress results from a combination of factors, which are difficult to separate. However, as research has shown, the high-pressure environment of the modern workplace accounts for most of the problems linked to stress. Loosemore and Waters<sup>4</sup> in their study found the greatest sources of stress were long hours and too much work. The most stressful factors at work comprised work overload, lack of rewards, and threat expressed by being at risk of conflicts at work, worsening or loss of health. Furthermore, they mentioned job stress is the result of a "mismatch" between the worker and his or her job. There is a clear linkage between stress and other workplace issues such as, for example, enterprise restructuring and employment, working time, flexibility, skills development, payment systems, control and participation.

Several researches had been done on stress in Iran among groups like teachers and managers of a car manufacturer, in these studies the prevalence for stress and mental strain were 23.4 and 49.5<sup>5,6</sup>. Nevertheless, this is one of the premier studies on occupational stress and also coping strategies with such a great distribution in our country. Moreover, eliminating stress among workers in factors has great influence on improving socio-economic qualities between both workers society and economic situation of industry. Stress is a serious problem, which reduces quality and responsibility of workers. NOHSC<sup>7</sup> believed that epidemiological sign indicates that occupational stress is rapidly emerging as the only most cause of work-related disease and injury.

However, until recently, there is no a study on occupational stress among white-collar workers in ESCO but also in whole country. Outcome of this study will help to identify source of occupational stress among the workers and take action to reduce or prevent the occupational stress by the workers and policy makers to develop an appropriate plan, program and policy. Aim of this study was to investigate occupational stress among white collar employees in Esfahan Steel Company organization (ESCO), Iran.

## **MATERIALS AND METHODS**

### **Study design and data collection**

A cross-sectional survey was conducted among the white-collar workers in ESCO, Iran. The data was collected using structured face to face interviews based on a questionnaire by researcher, and no financial incentives were offered to the participants. Each interview took about 20 to 30 minutes to be completed.

### **Sample size and sample selection**

Based on the single proportion formula at 95% confidence interval (CI)<sup>8</sup>, the sample size was estimated to be composed of 180 respondents, which rose to 220 to increase the confidence level, while 20 were excluded due to their incomplete questionnaires. All the 200 selected participants were white-collar workers who had at least 1 year work experience in ESCO, and were sampled based on the randomized sampling method from March to July 2008.

### **Study location**

This study was conducted in Esfahan steel company organization (ESCO), Iran. The ESCO was established on the occasion of act No.23 in 1959 and in order to construct the company. Discovery of raw materials at coal mines was made, after that identification of the amount as well as the type of these materials was done. Consequently with the consultation of Russian and French

expert Engineers, different locations for the site of the company evaluated and finally selected the site on south-west of Esfahan at 45 Km of Esfahan to Shahrekord road. ESCO mainly divided into two big categories: operational and non-operational. Operational employees are blue-collar workers who do the manual job of producing steel while non-operational employees are the white-collar workers who do the office work including managers. The main products of the factory are various models of steel, which supplies, the need of Iran for steel. Total employees are about 6000, about 4000 are blue collar and others are as the white-collar workers.

### Study tool

The main questionnaire included two main parts; in the first part, socio-demographic data, including age, number of children, marital status, monthly income, educational level, shift work and years of work experience, were asked. An outcome-related questionnaire was designed based on the stress scale extracted from the validated Depression, Anxiety, and Stress Scale (DASS)<sup>9</sup>. In the stress scale questionnaire, 14 items were designed specifically to assess stress. Difficulty in relaxing, nervous arousal, being easily upset/agitated, being irritable/over-reactive and restlessness were assessed based on this scale. The English questionnaire was translated into Persian language and back translated into English by a group of public health tutors and professors in Shahrekord and Esfahan University of Medical Sciences.

Prior to the survey, the questionnaire was pre-tested to assess its clarity, sequencing and time needed to complete. Pre- test of questionnaire was done on twenty respondents who were chosen to ensure that the questions are easily understood. The internal reliability of the questionnaire as a DASS subscale was found to be high based on a Cronbach's alpha of 0.84. Afterwards, perceived stress and likely stressors,

including economic problems, family-related problems, work environment, colleagues and task type, were asked.

### Scoring

All items were rated on a four point scale, where 0 = Does not apply to me, and 3 = Applies to me very much or most of the time<sup>10</sup>. As the stress scale questionnaire is designed to be used especially in developed countries (with the cut-off point of 14)<sup>11</sup> based on the Receiver Operating Characteristic (ROC) curve, the cut-off point was reconsidered by the authors and found to be 12 for Iran based on the cut point participants who scored 12 or higher were considered as stressful.

### Statistical test

The collected data were analysed using the Statistical Package for the Social Sciences v. 16 (SPSS Inc., Chicago, IL, USA) for Windows. For bivariate analysis, Chi-square test was used. The logistic regression model was examined to determine the associated parameters of stress among the participants. Odds Ratios (ORs) and 95% CIs were reported. A  $P < 0.05$  was considered significant.

### Ethics consideration

Informed written consents were taken from the participants and the manager of ESCO. All the questionnaires were anonymous and we assured participants that their information would be kept confidential. This study was also approved and supervised by the head of the Research and Development Department of ESCO.

## RESULTS

Two hundred white -collar workers agreed to participate in this study and they were face to face interviewed by researcher. Majority of them, 167 (83.55) were married, only 33 (16.5%) were single. There were 51 (25.5%) less than 29 year old, 91 (45.5%) 30-39 years old, 52 (26%) 40-49 years old and only 6 (3%) more than 50 year old workers. Most

of the workers, 123 (61.5%) hold diploma & associated degree, 43 (21.5%) hold bachelors and postgraduate degree, 18 (9%) hold Primary & secondary school certificate and 16 (8%) hold high school certificate. Among the participants 160 (80%) don not do shift work only 40 (20%) do shift work.

The mean age of the 200 participants was 35.3 ±7.2 years, and ranged from 21 to 53 years. The mean of number of children was 1.4 ±1.1 and ranged from 0 to 5, interim of gender of children the mean of the girls was 0.67 ±0.8 and ranged from 0 to 3 while mean of the

boys was 0.73 ±0.8 and ranged from 1 to 3. The mean of the year of working experience was 11.8 ±7.6 and ranged from 1 to 29 years in this study.

Table 1 presents frequency of sources for stress among the employees. Among the six items measuring source of stress, the highest source of stress related to economic problem, 117 (59.7%) participants have always stress because of the economic problem followed by task type 62 (31.55) , colleagues and working environment.

Table 1: Frequency of sources for stress among employees

Sources	Rarely		Always	
	Frequency	(%)	Frequency	(%)
Task type	135	68.5	62	31.5
Economical problem	79	40.3	117	59.7
Colleagues	140	71.4	56	28.6
Work environment	141	71.9	55	28.1
Children's problem	179	91.3	17	8.7
Relatives	170	86.7	26	13.3

Table 2 demonstrated association of socio-demographic factors and stress among participants. Based on the result, it is shown the stress was significantly associated with income (p=0.03),

however other variables such as age, marital status, educational level, shift work and year of working are not statistically significant.

Table 2: Association of socio-demographic factors and Stress among study sample (n=200)

Variables	No stress		Stress		P value
	N	%	N	%	
<b>Age group</b>					
<29 years	30	58.8	21	41.2	
30-39	41	45.1	50	54.9	
40-49	39	75	13	25	
>50	3	50	3	50	0.006
<b>Marital status</b>					
Single	97	58.1	70	41.9	
married	16	48.5	17	51.5	0.3
<b>Educational level</b>					
Primary& Junior High school	7	38.9	11	61.1	
High school	9	56.2	7	43.8	
Diploma & Associate Degree	70	56.9	53	43.1	
Bachelor and higher graduates	27	62.8	16	37.2	0.3
<b>Shift work</b>					
No	95	59.4	65	40.6	
Yes	18	45	22	55	0.1
<b>Income \$ per month</b>					
<600\$	84	57.1	63	42.9	
>600\$	39	73.6	14	26.4	0.03
<b>Total years of work experience</b>					
<5 years	33	56.9	29	43.1	
5-10 years	18	42.9	24	57.1	
>10 years	62	62	38	38	0.1

Table 3 depicts association source and stress among the workers. The sources of stress such as task type ( $p=0.001$ ), economic problem ( $p=0.001$ ), work

environment ( $p=0.001$ ) and children problem ( $p=0.05$ ) were associated with having stress among the workers.

Table 3: Association of sources of stress among Esfahan Steel Employees (n=200)

Sources of stress		No stress		Stress		P
		N	%	N	%	
Task type	Rarely	85	63	50	37	0.001
	Always	26	41.9	36	58.1	
Economical problem	Rarely	57	72.2	22	27.8	0.001
	Always	53	45.3	64	54.7	
Colleagues	Rarely	82	58.6	58	41.1	0.27
	Always	28	50	28	50	
Work environment	Rarely	91	64.5	50	35.5	0.001
	Always	19	34.5	36	65.5	
Children's problem	Rarely	86	48	93	52	0.05
	Always	4	23.5	13	76.5	
Relatives	Rarely	103	57.5	76	42.5	0.19
	Always	7	41.2	10	58.8	

Table 4 presents that only job psychology (p=0.04) was significantly associated with stress. The other job control components were not significantly associated with stress among the workers.

Table 4: Job Control Components regarding Stress among study sample (n=200)

	Stress	Mean	Standard deviation	t	p
Job control	No	24.7	7.5	-0.1	0.9
	Yes	24.8	4.9		
Job psychology	No	12.7	2.1	-2.1	0.04
	Yes	13.4	2.4		
Job physiology	No	2.4	1.2	-1.1	0.2
	Yes	2.6	1		
Job social support	No	4.6	1.6	-1.5	0.1
	Yes	4.9	1.5		

Table 5 demonstrates that some types of coping were associated with stress such as emotional use (p=0.001), behaviour disengagement (p=0.001), venting

(p=0.001), positive reframing (p=0.02) and Self-blame (p=0.001).

Table 5: Type of Coping regarding Stress among study sample (n=200)

Type of coping	Stress	Mean	Standard deviation	t	p
Self-distraction	No	5.1	1.6		
	Yes	5	1.5	-0.59	0.5
Active coping	No	6.7	1.5		
	Yes	6.4	1.4	1.3	0.1
Denial	No	3.6	1.6		
	Yes	3.9	1.3	-1.6	0.1
Substance use	No	2.2	0.81		
	Yes	2.2	0.82	0.005	0.99
Emotional use	No	6	1.6		
	Yes	5	1.5	-4.7	0.001
Instrument support	No	6	1.5		
	Yes	5.9	1.4	-.62	0.5
Behaviour disengagement	No	3.1	1.3		
	Yes	4.3	1.7	-5.5	0.001
Venting	No	5.5	1.6		
	Yes	4.8	1.3	-3.2	0.001
Positive reframing	No	6.3	1.6		
	Yes	5.8	1.5	2.3	0.02
Planning	No	6.3	1.5		
	Yes	6.1	1.3	-0.95	0.34
Humour	No	3.6	1.4		
	Yes	3.3	1.6	-1.6	0.09
Acceptance	No	6	1.5		
	Yes	5.8	1.5	0.1	0.3
Religious	No	6.1	1.6		
	Yes	6.5	1.2	-1.6	0.09
Self-blame	No	4.4	1.5		
	Yes	5.6	1.7	-5	0.001



## DISCUSSION

We conducted this study among white collar employees in ESCO, one of the biggest factories in Iran. The factory has around 6,000 workers, which of 4,000 workers are blue collar and 2,000 workers are white collar. Based on the results we can see that around half of the participants in this study perceived stress in ESCO. These results provide support to the argument reported by Soori and his colleagues that level of occupational stress among the managers (white-collar workers) was at around 50% in a car manufacturer in Iran. This result is self-explanatory, the occupational stress among the white collar workers considerably high in Iran.

Relating to socio-demographic variables, it is interesting to find that age between 30-40 years old workers perceived higher stress compared to other age groups. This result is unlikely to obtain from Hong Kong Study<sup>12</sup> but our finding is similar to a research done by Manshor<sup>13</sup> he confirmed that age was significantly correlated with source of stress. They found that older workers in China perceived higher stress. Perhaps the data set in this study is not comparable to the data set obtained 17 years ago. It could be due to the fact that these ages at stage of development of their family it means more attention to the family developmental and their needs. It is also found in this study that stress level was higher among the workers who earn less than US\$ 600 per month compare to who earns more than that. This finding supported by a research by Roohafza and his colleagues<sup>14</sup>, they found that stress was higher among lower income people. It is clearly due to amount of money that they earn may not enough to cover their needs.

Working environment, Task type, economical problem and children problems were significantly associated with occupational stress. Our findings supported by World Health organization

statement and some other researchers findings from their studies. WHO<sup>15</sup> believes workers who are stressed also are more likely to be unhealthy, poorly motivated, less productive and less safe at work. Their organizations are less successful in a competitive market. Generally, stress results from a combination of factors, which are difficult to separate. However, as research has shown, the high-pressure environment of the modern workplace accounts for most of the problems linked to stress.

Loosemore and Waters<sup>16</sup> in their study found the greatest sources of stress were long hours and too much work. The most stressful factors at work comprised work overload, lack of rewards, and threat expressed by being at risk of conflicts at work, worsening or loss of health. Furthermore, they mentioned job stress is the result of a "mismatch" between the worker and his or her job. There is a clear linkage between stress and other workplace issues such as, for example, enterprise restructuring and employment, working time, flexibility, skills development, payment systems, control and participation. Furthermore, the advocate a healthy job is likely to be one where the pressures on employees are appropriate in relation to their abilities and resources, to the amount of control they have over their work, and to the support, they receive from people who matter to them. They also claimed stress affects different people in different ways. The experience of work stress can cause unusual and dysfunctional behaviour at work and contribute to poor physical and mental health<sup>17</sup>.

From the outcome of this study and others research, we can see common source of stress were work environment, task type and economic problem. Generally, while stress affects different people in different ways but the experience of work stress can cause unusual and dysfunctional behaviour at



work and contribute to poor physical and mental health.

## CONCLUSION

We found that around half of the white collar workers were under stress at ESCO. Main sources of the occupational stress were related to work environment, economic problem; problems related to their children. Policy makers should pay more attention to improve work environment and increase their salary. It is necessary to develop a strategic plane for occupational stress in this company to improve the workers life. Finally, educating the workers proper way of coping with stress could be effective to reduce the prevalence of occupational stress among employees in ESCO also in other factors in Iran. This study was conducted among small number of white colour workers at only one factory in Iran due to limited budget and human resource because of this limitation outcome of this study may not be representative to whole country. We would recommend that this kind of study should be conducted at different factors in other provinces as well should not be limited to a single study center.

## Acknowledgment

We would like to thank Shahrekord University of Medical Sciences, Iran, and, National University of Malaysia, Medical Center (UKMMC). We also like to thank managements of the Esfahan Steel Company and all workers who participated in this study.

## REFERENCE

1. CWA, Communications workers of America union for information age; 2009.  
[http://www.cwa-union.org/pages/Occupational Stress and the Workplace](http://www.cwa-union.org/pages/Occupational%20Stress%20and%20the%20Workplace)
2. Rosenstock, L. Cullen, M. R. Brodtkin, C. A. & Redlich, C. A. 2005. Clinical Occupational and Environmental Medicine. Second (ed), Psychologic Stressors and Work Organization, New York: Elsevier Saunders. pp. 931-942.
3. WHO. 2007. Raising awareness of stress at work in developing countries, A modern hazard in a traditional working environment, Protecting workers' health series; no. 6.
4. Loosemore, M & Tom Waters, T. Gender Differences in Occupational Stress Among Professionals in the Construction Industry. *Journal of Management in Engineering* 2004; 20 (3):126.
5. Yousefy, A.R. & Ghassemi, Gh.R. 2006. Job burnout in psychiatric and medical nurses in Isfahan, Islamic Republic of Iran. *Eastern Mediterranean Health Journal*; 12(5).
6. Soori, H. Rahimi, M. and Mohseni, H.. Occupational stress and work-related unintentional injuries among Iranian workers; a case control study. *Iran Epidemiology Journal (Special)* 2005; 14(3).
7. National Occupational Health and Safety Commission (NOHSC). 2006. Job stress, causes, impact and interventions in the health and community sector. University of South Australia..
8. Rosenstock, L. Cullen, M. R. Brodtkin, C. A. & Redlich, C. A. 2005. Clinical Occupational and Environmental Medicine. Second (ed), Psychologic Stressors and Work Organization, New York: Elsevier Saunders. pp. 931-942.
9. Lovibond, P.F.; Lovibond, S.H.. "The structure of negative emotional states: Comparison of

- the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories". *Behaviour Research and Therapy* 1995; **33**(3): 335-343.
10. Lovibond S, Lovibond, P. 1995. Manual for the Depression, Anxiety, Stress Scales. 2<sup>nd</sup> ed. Sydney NSW: Psychology Foundation.
  11. Raeissei P, Tavakoli G.. Impact of occupational stress on mental health and job performance in hospital managers and matrons. *Iran. Hakim Med J* 2002; **4**:247-56.
  12. SIU, Oi Ling, .1996."Stress at work, coping, and workers' health of an acquired firm in Hong Kong". Centre for Public Policy Studies: CPPS Working Paper Series. Paper 22
  13. Manshor, A. T. Fontaine, R. & Choy, C. S.. Occupational stress among managers: a Malaysian survey. *Journal of Managerial Psychology* 2003; **18**(6): 622-628.
  14. Roohafza HR. Salehi, B. & Sadeghi, M.. Prevalence and severity of emotional stress in Isfahan and Markazi provinces. *Arak University of Medical Sciences Journal* 2006; **10**(2):1-9.
  15. WHO. 2010. Environment and health risks: a review of the influence and effects of social inequalities. WHO Regional Office for Europe Scherfigsvej 8 DK-2100 CopenhagenØ, Denmark..
  16. Loosemore, M & Tom Waters, T.. Gender Differences in Occupational Stress Among Professionals in the Construction Industry. *Journal of Management in Engineering* 2004; **20**(3):126.
  17. Sravroula Leka. 2003. Systematic problem approaches for employers, managers and trade union representative. WHO library cataloguing-in-publication data.