

Effect of a brief stress management intervention on work-related stress in employees of Isfahan Steel Company, Iran

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BACKGROUND: Work-related stress has increased during recent years throughout the world. Studies demonstrate that Work-related stress can have a negative effect on the quality of life, productivity, and as a result lead to considerable socioeconomic consequences. The purpose of the current study was to examine the effects of a brief stress management intervention on work-related stress in employees of Isfahan Steel Company in Iran. **METHODS:** A quasi-experimental design was used to compare the intervention group with the control group. Eighty-eight employees of Blast Furnaces were randomly allocated to intervention (n = 44) and control groups (n = 44) and completed Occupational Role Questionnaire before and after A brief three-session CB (Cognitive behavioral) stress management. **RESULTS:** After the intervention significant differences were detected between the control and intervention groups in role overload, role insufficiency, role boundary, and responsibility but not in role ambiguity and physical environment. **CONCLUSIONS:** Results suggest that the brief stress management intervention can be considered as a preliminary education for employees to develop skills to cope with role overload, role insufficiency, role boundary, and responsibility, which are some of the factors of work-related stress.

KEYWORDS: Workplace, Psychological Stress, Cognitive Therapy, Iran

BACKGROUND

Poor mental health in the working population has increased during recent years throughout the world. Although there is an abundant body of research from industrialized countries, we currently require research data from developing countries. The changing nature of work and the impact of globalization increase the importance of addressing mental health in the working population in developing countries.^[1]

Mental health disorders frequently categorized is the first or second most common cause of extended sick leave from work. Moreover, the International Labor Organization considers that psychosocial problems make up, in the world, one of the principal causes of accidents, illness, absenteeism, and death in the workplace.^[2]

The prevalence of mental health disorders in people of effective age has been reported to range between 10% to 18%,^[3] and it has been estimated that by 2020 the global burden will be second only to ischemic heart disease.^[4]

Numerous studies demonstrate that mental health problems can have a negative effect on the quality of life,^[3,5] and productivity and as a result

lead to considerable socioeconomic consequences.^[3,6]

In the majority of people with mental health problems, stress has been identified as the underlying cause.^[7]

The word stress refers to “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being”.^[8]

Work related stress has more progressively become a concern for many workplaces for example the American Institute of Stress reported that stress is a major factor in up to 80% of all work-related injuries and 40% of workplace turnovers.^[9] The Confederation of British Industry reported stress as the second highest cause of absenteeism among no manual in the United Kingdom, and the European Foundation for the Improvement of Living and Working Conditions reported that stress affects a third of the European working population.^[9]

As mentioned above no accurate national data on the prevalence of stress among employees are available in developing countries such as Iran but a number of studies revealed that a high percentage of the employees are suffering from high levels of

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stress; for instance evaluation of occupational stress in an Iranian automobile manufacturing company revealed that 88% of the workers had a high level of stress, 10% a moderate level of stress and 2% a low level of stress.^[10]

Another study in an industrial company in Iran showed that the prevalence of job stress was 21.3%. The main occupational stressors were time pressure (78.5%), mode of payment and evaluation (56.4%), and interaction with people and machines (41.3%). Furthermore, Job stress was responsible for 11.9% of all occupational injuries in this group.^[11]

A number of studies with a cross-sectional or prospective design have shown a variety of adverse health outcomes to be positively associated with job stress.^[12]

To avoid adverse health outcomes many organizations have created stress management training programs to reduce the stress levels and promote the mental health of their employees.

With regard to the relevant literature, studies on the effectiveness of stress management intervention in the workplace are called for.^[13]

Several studies which have addressed occupational stress have been mainly focused on the administrative environment and less attention has been paid to occupational stress in industrial environments.

Considering the unique characteristics of each type of work environment, it is necessary that educational intervention be appropriate to the occupational environment.

With the development of industrialization in Iran mental health, especially stress, has become an occupational health issue and is attracting increasing concern.^[12] Due to the lack of resources and facilities it is imperative to design and implement useful and effective as well as brief interventions.

In this situation, there is an urgent need for more knowledge about the effectiveness of interventions.

This study aimed to examine the effects of a brief stress-management intervention on work-related stress in employees of Isfahan Steel Company.

METHODS

Design and Participants

A quasi-experimental study was used to examine the

effect of a brief stress management education among employees of Isfahan Steel Company. The sampling method was census.

Eighty-eight employees of Blast Furnaces in Isfahan Steel Company, the oldest iron and steel producer of Iran and one of the three main sources of iron and steel in Iran, participated in the study.

Participants were randomly allocated to the intervention group (n = 44) or control group (n = 44).

Measurements

Demographic data were measured by a short questionnaire including age, years of education, duration of occupational career, and marital status.

Occupational Role Questionnaire (ORQ) portion of the Occupational Stress Inventory-Revised (OSI-R)^[14] was used.

The ORQ scales measured the following stress inducing work roles: role overload, role insufficiency, role ambiguity, role boundary, responsibility, and physical environment.

High scores in role overload indicated that demands are greater than resources. High scores in role insufficiency indicated lack of challenges or demands and high levels of boredom. High scores in role ambiguity indicated a lack of direction and definition on the job. High scores in role boundary indicated job dissatisfaction or disgust and excessive instruction by superiors. High scores in responsibility indicated an acceptance of additional responsibility and work demands in order to ensure that other employees can successfully complete their job. High scores in physical environment reported unpleasant work environments.

The responses were scored according to the OSI ORQ instruction manual's method. Each scale consisted of ten items and with a possible numerical response of 1 to 5. Some of the items was reverse weighted.

(OSI-R) has been widely critiqued and validated in numerous studies and was examined for reliability, through test-retest and internal consistency analysis with the normative sample.^[14]

(OSI-R) has been translated into Persian by previous researchers and its reliability and validity has been investigated.^[16]

In this study internal consistency has been deter-

mined for each of the subscales and for the total measure using Cronbach's α -coefficient. Cronbach's α -coefficient for total scale is 0.91 and for sub-scales are equal to 0.70 for role overload, 0.72 for role insufficiency, 0.68 for role ambiguity, 0.71 for role boundary, 0.66 for responsibility, and for physical environment 0.69.

Procedure

The positions with the highest stress level in the Isfahan Steel Company tend to be in the Blast Furnace.^[15] Employees of Blast Furnaces were chosen for study due to their unpleasant work environment and hard and dangerous duties. All Employees of Blast Furnaces were requested to volunteer to participate in the study. From a population of 148 employees, 89 individuals volunteered to participate.

Volunteers were randomly assigned to the two groups. A random assignment table was utilized for assignment into intervention and control groups. The questionnaires were distributed in the groups one week before the intervention and again one month after the intervention. Two participants dropped out of the intervention and three participants in control group did not supply the final questionnaires. Finally, 42 participants completed the intervention, and 42 participants were controls. Data were analyzed using version 12 of the Statistical Package for the Social Sciences for Windows (SPSS).

Stress management intervention

A brief three-session CB stress management was designed based on Cognitive therapy.

The intervention was aimed to inform employees about the role of their thoughts and emotions in managing stressful events and to provide them with the skills to adjust their thoughts to assist adaptive coping.^[9]

The Stress management intervention was intended to enable the employees to use the CB approach, to manage their emotions in stressful work-related situations that are common among employees in the Iranian industrial context. Short lectures and active participation in group discussion were the main activities in the education.

The participants were arranged in groups, 10 members per group, and each group was led by one facilitator, who had received training on administration groups with CB approach.

The intervention consisted of three sessions, one

session per week over three weeks. In the first session (75 minutes) employees were educated about the causes of stress in the workplace and were trained to analyze conditions that caused them stress and to distinguish environmental and mediating variables and how they counter stress. The second session (75 minutes) consisted of training relaxation techniques as well as deep muscle relaxation, cue-controlled relaxation, and breathing instruction training and rational reorganization techniques. The third session (75 minutes) consisted of practice in applying the skills learned in stage two.

After the intervention was completed the participants were requested to continue training in their own work environment.

Ethical consideration

Ethics approval was obtained from the Internal Review Board of the Isfahan Steel Company. The details of the study were explained to the participants in the intervention group and they were asked to read and sign a consent form, and were assured of the confidentiality. Participation in the study was voluntary; participants were given the opportunity to leave the study if they become uncomfortable. The control group was given the opportunity to participate in the stress management intervention after the study was completed.

RESULTS

All employees were full-time shift men. The mean and standard deviation of age in control and intervention groups were 35, 4.72 and 34, 4.77 respectively. 86% of employees in the control group and 80% of employees in the intervention group were married. The mean and standard deviation of the duration of occupational career in the control and intervention groups were 9.6, 3.53 and 8.9, 3.21 respectively.

The mean and standard deviation of years of education in control and intervention groups were 10.8, 2.5 and 11.2, 2 respectively. The differences between these groups were not statistically significant.

To explore the impact of the intervention, a pre-test and post-test analysis of the two groups was conducted in all of the domains of the ORQ.

Means and standard deviations of the OSI-R subscales for the ORQ were calculated for both the intervention and control groups one week before the intervention and again a month after the intervention. One-way ANOVAs were run on all six of the OSI-R ORQ subscales in the pre-test to ensure that the two groups

were equally matched on the dependent variables. The ORQ subscales served as the dependent variable, and the group was the independent variable. No significant pre-test differences existed between groups on the ORQ subscales $p > 0.05$.

The results of post-test analysis on ORQ domains can be seen in table 1.

One-way ANOVAs were run on post-intervention data to explore the impact of the intervention.

Table 1. Intervention and control groups: pre-test analysis on ORQ domains

	Intervention (n = 44)					control (n = 44)					P-value
	Mean (SD)	N (%)	N (%)	N (%)	N (%)	Mean (SD)	N (%)	N (%)	N (%)	N (%)	
T- scores of subscale of OSI-R:Occupational Role Questionnaire (ORQ)											
domains		≤ 39 (Relative absence of Stress)	40-59 (normal range)	60-69 (mild mal -adaptive Stress)	≤ 70 (strong mal -adaptive stress)		≤ 39 (Relative Of Stress)	40-59 (normal range)	60-69 (mild mal -adaptive Stress)	≤ 70 (strong mal -adaptive stress)	
Role Overload	37.86 (7.19)	5(11.4)	7(15.9)	5(11.4)	27(61.4)	35.71 (7.78)	4(11.5)	14(31.1)	11(24.4)	16(35.6)	0.179
Role Insufficiency	26.04 (3.62)	10(22.8)	14(28.2)	15(34.2)	5(11.4)	26.93 (2.59)	11(24.4)	15(33.3)	17(37.7)	2(4.4)	0.187
Role Ambiguity	22.59 (2.23)	10(22.8)	16(36.8)	13(29.9)	5(11.4)	21.75 (1.82)	12(26.6)	17(37.7)	15(33.3)	1(2.2)	0.056
Role Boundary	32.09 (6.33)	6(13.6)	18(40.9)	12(27.3)	8(18.2)	34.22 (5.86)	3(6.7)	21(46.7)	10(22.2)	11(24.4)	0.103
Responsibility	36.72 (9.19)	6(13.6)	7(15.9)	4(9.1)	27(61.4)	34.55 (9.16)	6(13.3)	14(31.1)	9(20)	16(35.6)	0.267
Physical Environment	38 (6.14)	1(2.3)	13(29.5)	4(9.1)	26(59.1)	36.13 (4.99)	0	16(35.6)	10(22.2)	19(42.2)	0.120

Table 2. Intervention and control groups: post-test analysis on ORQ domains

	Intervention (n = 42)					control (n = 41)					P-value
	Mean (SD)	N (%)	N (%)	N (%)	N (%)	Mean (SD)	N (%)	N (%)	N (%)	N (%)	
T-scores of subscales of OSI-R:Occupational Role Questionnaire (ORQ)											
domains		≤ 39 (Relative absence of Stress)	40-59 (normal range)	60-69 (mild mal -adaptive Stress)	≤ 70 (strong mal -adaptive stress)		≤ 39 (Relative absence Of Stress)	40-59 (normal range)	60-69 (mild mal -adaptive Stress)	≤ 70 (strong mal -adaptive stress)	
Role Overload	32.78 (4.83)	6(14.6)	13(31.7)	14(34.1)	8(19.5)	35.99 (7.25)	2(4.8)	13(31)	12(28.6)	15(35.7)	0.023
Role Insufficiency	24.82 (3.55)	14(33.3)	16(38)	12(28.5)	0	26.65 (2.89)	12(28.6)	15(35.7)	14(33.3)	1(2.4)	0.014
Role Ambiguity	21.19 (1.90)	12(28.5)	17(40.5)	13(31)	0	22.07 (2.58)	10(23.8)	17(40.5)	13(31)	2(4.8)	0.079
Role Boundary	26.45 (5.25)	21(50)	17(40.5)	3(7.1)	1(2.4)	33.80 (5.78)	3(7.1)	17(40.5)	13(31)	9(45.2)	0.000
Responsibility	29.90 (9)	9(21.4)	13(31)	14(33.3)	6(14.3)	33.97 (8.38)	8(19)	10(23.8)	5(11.9)	19(45.2)	0.035
Physical Environment	37.40 (4.81)	1(2.4)	11(26.2)	7(16.7)	23(54.8)	35.30 (4.35)	0	15(35.7)	15(35.7)	12(28.6)	0.065

Significant differences between the two groups were observed in the role overload, role insufficiency, role boundary, and responsibility $p > 0.05$.

No differences were observed between the two groups in the role ambiguity ($p = .079$) and physical environment ($p = .065$) subscales. The results of post-test analysis on ORQ domains can be seen in table 2.

DISCUSSION

According to the results 61.4% of employees in the intervention group, and 35.6% in the control group had strong maladaptive stress on role overload and responsibility dimensions. These findings were consistent with findings of previous studies in Iran.^[16]

The higher stress in this dimension may be due to the heavy workload, lack of resources (including equipment and material to do tasks), and absence of appropriate company procedures, insufficient time to perform duties, and etcetera.

In the physical environment dimension 59.1% of employees in the intervention group, and 42.2% in the control group had strong maladaptive stress; similar findings were obtained by other researchers.^[10,11,17]

In the role boundary 45.5% of employees in the intervention group, and 46.6% in the control group had mild maladaptive and strong maladaptive stress that indicated job dissatisfaction or disgust and excessive instruction by superiors. The importance of superior's role in mental health and stress management and job satisfaction has been punctuated in numerous studies.^[18,19]

The higher scores on this dimension may also imply unfavorable work relationships, insufficient consultation and communication, inadequate feedback on performance and organizational changes.

No significant differences were observed between the intervention and control groups in the dimensions of OSI-R ORQ and demographic variable before the Intervention. This suggests that the control and intervention groups were similar.

A month after the intervention employees in the intervention group experienced significant reduction in the role overload, role insufficiency, role boundary, and responsibility domains of the OSI-R ORQ. These findings add to a great body of literature indicating

that CB stress management intervention is an effective tool in reducing levels of perceived stress.^[9, 20-23]

Interpretations of the mean scores on all six subscales of the OSI-R ORQ revealed improvement across time for those who participated in the intervention. Significant differences were detected between the control and intervention groups on four of the six post-intervention subscales. The majority of employees in the intervention group showed significantly lower stress levels in comparison to their control group counterparts. On the other hand, no significant differences were found between the two groups in role ambiguity and physical environment.

The results imply that brief three-session CB stress management intervention might be an effective means for appeasing the devastating effect of occupational stress in the areas of role overload, role insufficiency, role boundary, and responsibility, but not in role ambiguity and physical environment. These results show the necessity for more interventions that deal with both organizational and individual variables related to workplace stress, for instance engineering, technology, and management modifications as well as individual skills.

The present results show that maladaptive stress mainly arose from responsibility, role overload, and physical environment in the employees of Isfahan Steel Company. There is an imperative need for effective intervention for employees to promote their psychological and physical health and to prevent losses in productivity.

There is no doubt that in developing countries such as Iran the resources are scarce thus there is an urgent need for more effective and affordable interventions.

Stress management intervention applied in this study was brief and effectively reduced the stress level in employees. The stress management intervention can be considered as a preliminary education for employees to develop skills to cope with work-related stress, which can be included in a more extensive education to attain long-term results.

The current study was limited to Blast Furnaces in Isfahan Steel Company and had participants from a small group of employees; therefore, future researches must have participants from different parts of a company, increasing the number of participants would also allow for a more robust evaluation and analysis.

This study had pre- and post- intervention measurements at two times, which only showed the short term effects of the intervention. Follow-up measurement at a later time may permit assessment of the effects of the intervention in the medium and long term.

Another limitation of this study was the lack of observational or performance variable examination. Improving performance is a critical component in terms of making interventions socially valid for employers. Future research must use both observational and self-report measures when analyzing workplace stress.

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REFERENCES

1. Kortum E, Leka S, Cox T. Perceptions of psychosocial hazards, work-related stress and workplace priority risks in developing countries. *J Occup Health* 2011; 53(2): 144-55.
2. Bourbonnais R, Brisson C, Vinet A, Vezina M, Lower A. Development and implementation of a participative intervention to improve the psychosocial work environment and mental health in an acute care hospital. *Occup Environ Med* 2006; 63(5): 326-34.
3. Uegaki K, Bakker I, de BM, van der Beek A, Terluin B, van MH, et al. Cost-effectiveness of a minimal intervention for stress-related sick leave in general practice: results of an economic evaluation alongside a pragmatic randomised control trial. *J Affect Disord* 2010; 120(1-3): 177-87.
4. Murray CJL, Lopez AD. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. The Harvard School of Public Health on behalf of the World Health Organization and the World Bank; 1996.
5. Lim D, Sanderson K, Andrews G. Lost productivity among full-time workers with mental disorders. *J Ment Health Policy Econ* 2000; 3(3): 139-46.
6. Tsutsumi A, Nagami M, Yoshikawa T, Kogi K, Kawakami N. Participatory intervention for workplace improvements on mental health and job performance among blue-collar workers: a cluster randomized controlled trial. *J Occup Environ Med* 2009; 51(5): 554-63.
7. Nystuen P, Hagen KB, Herrin J. Mental health problems as a cause of long-term sick leave in the Norwegian workforce. *Scand J Public Health* 2001; 29(3): 175-82.
8. Lazarus RS, Folkman S. Stress, appraisal, and coping. New York: Springer Pub. Co; 1984.
9. Richardson KM, Rothstein HR. Effects of occupational stress management intervention programs: a meta-analysis. *J Occup Health Psychol* 2008; 13(1): 69-93.
10. Mohammad FAM I, Mahmoudi S, Kianfar A. Evaluation of relationship between job stress and unsafe acts with occupational accident rates in a vehicle manufacturing in Iran. *International Journal of Occupational Hygiene* 2010; 2(2).
11. Soori H, Rahimi M, Mohseni H. Occupational stress and work-related unintentional injuries among Iranian car manufacturing workers. *East Mediterr Health J* 2008; 14(3): 697-703.
12. Choobineh A, Ghaem H, Ahmehdinejad P. Validity and reliability of the Persian (Farsi) version of the Job content questionnaire: a study among hospital nurses. *East Mediterr Health J* 2011; 17(4): 335-41.
13. Michie S, Williams S. Reducing work related psychological ill health and sickness absence: a systematic literature review. *Occup Environ Med* 2003; 60(1): 3-9.
14. Osipow SH, Spokane A. Occupational Stress Inventory-Revised. Odessa: Psychological Assessment Resources; 1998.
15. Amidi Mazaheri M, Heidarnia A, Ghofranipour F, Shafie A. The effect of theory-based intervention on promote workers' safe behavior in Isfahan steel company. *Journal of shahid Sadoughi University of Medical Sciences and Health Services* 2010; 27(102): 798-808.
16. Nasiripour A, Raeissi P, Shabanikiya H. Occupational stress among rural health workers in Mashhad district, northeast Iran. *Journal of Research in Health Sciences* 2011; 9(1): 21-9.
17. Abdi H, Shahbazi L. Correlation between occupation stress in nurses at intensive care unit with job burnout. *Journal of Shahid Sadoughi University of Medical Sciences and Health Services* 2001; 9(3): 58-63.
18. Nicpeyma N, Gholamnejad H. Influencing factors on hospital nurses' perspectives about different dimensions of organizational climate. *Hayat* 2010; 16(2): 72-8.
19. Dehghan Nayeri N, Negarandeh R, Bahrani N, Sadoghi Asl A. Conflict management among clinical nurses. *Hayat* 2010; 16(2): 72-8.
20. Evers KE, Prochaska JO, Johnson JL, Mauriello LM, Padula JA, Prochaska JM. A randomized clinical trial of a population- and transtheoretical model-based stress-management intervention. *Health Psychol* 2006; 25(4): 521-9.
21. Eisen KP, Bollash M, Allen GJ, Pescatello LS. Stress management in the workplace: A comparison of a computer-based and an in-person stress-management intervention. *Computers in Human Behavior* 2008; 24(2): 486-96.
22. Booth B. Cognitive-behavioral stress management program for correctional officers Theses. United States - Florida: Nova Southeastern University; 2009.
23. Nishiuchi K, Tsutsumi A, Takao S, Mineyama S, Kawakami N. Effects of an education program for stress reduction on supervisor knowledge, attitudes, and behavior in the workplace: a randomized controlled trial. *J Occup Health* 2007; 49(3): 190-8.

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