Predictive power of occupational stress and its dimensions by safety climate in workplace: implications for well-being

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Abstract

Evidence from a range of different data sources show that occupational stress is a significant problem in organizations and industries. Researchers have mentioned that safety climate may predict psychological distresses in the workplace. The present study examined degree of safety climate related to occupational stress and its dimensions among workers' a Steel Company. The current study was a cross-sectional study. Sample consisting of 189 employees in a Steel Company was selected according to the stratified random sampling method and responded questionnaires about demography characteristics, occupational stress and its components (perceived job self-efficacy and perceived job helplessness) and the safety climate. The data were analyzed by multivariate regression and correlation techniques.The results showed that:). There were significant correlations between safety climate with occupational stress as well as with its one component namely perceived job helplessness;) There wasn't a significant relationship between safety climate and perceived job self-efficacy;) in multivariate regression analysis, safety climate respectively about 15% and 19% of the variance of variables of job stress and perceived job helplessness significantly predicted. Improving safety climate can be an obstacle against the experience of occupational stress by workers.

Keywords: Climate, Helplessness, Safety, Self-Efficacy, Stress

Introduction

People work in the steel industry have been identified as having higher frequencies of occupational health problems, including musculoskeletal problems, than the total workforce as a high risk industry, there is a need to investigate factors that affect the occurrence of these accidents to be able to protect workers [1]. At first it seems that the definition of occupational accident is necessary. Occupational accident is an event unwanted and unplanned that is associated with the work and caused by unsafe acts, unsafe conditions, or both and might lead to immediate unpleasant effect or delay it as well as caused a worker or a large number of workers are suffering illness or death [1,2]. Occupational accidents are considered as one of the most important factors for disable and absenteeism workers. Since 1970, the world's increasing efforts to prevent occupational accidents have performed, but yet rate of occupational accidents is high. Each year, almost 250 million occupational accidents are reported that are causing to injuring 160 million workers [3]. Traditional methods to secure employees' safety have concentrated on the physical and biomechanical prospects of work by improving machines, equipment

and task completion manners [4]. However, it is believed that dimensions of psychosocial work environment such as stress as experienced by workers are related to depressive symptoms and poor health [5]. There are many studies that show occupational stress is considered as strong predictor to control the occupational accidents. It is related to many problems such as occupational disease, musculoskeletal disorders and other health outcomes in work environment [6]. many researchers observed significant relationship between the incidents and employees stress levels [7]. Stress is a response to stimuli and it occurs if the resources of individuals are threatened or lost, or if resource investment does not result in the desired outcomes. Especially, the incidence of stress and its outcomes depends on how the resources fit in the individual demands [8]. Individuals, when encounter with work requests and pressures that are not adapted to their knowledge and ability, experience occupational stress [9]. Occupational stress regarded as an important topic in the field of work health [10] because it has negative impact on workers' health and safety [11]. It results from Long-term exposure to workplace psychosocial risks, characteristics of the work environment, work design, and organizational management which potentially cause psychological and social damages [12].

Occupational stress in occupational setting may also result in a physical or psychological reaction such as absenteeism, turnover, job burnout [13], health problems, fatigue, and injuries at work [14]. Traditional methods to decrease job stress have concentrated on poor job/position design, poor job support and high workload [15]. However, it is believed that dimensions of psychosocial work environment such as safety climate as experienced by workers are likely to contribute to workers' experiences of occupational stress [16]. Safety climate is defined here as ''employees'' perceptions pertaining to safety policies, procedures, and practices'' (following Zohar [17]). Policies and procedures are the guidelines established to certify safe behavior, and practices are the process of the implementation of the policies and procedures as well as workers' perceptions of the relative importance of safe behavior at workplace [18]. The previous researches indicated that a positive safety climate is a critical part of a safe workplace. In briefly, safety climate is a theoretical term concentrating more on the perception of behaviors than on the behaviors themselves [19]. Safety climate reflect the extent to which workers believe that their individuals' safety and health are valued within the organization and reflect the relative stress that employees believe is placed on safety productivity [17,20]. There is increasing evidence of safety climate as an antecedent of safety performance [21]. It also has been suggested that safety climate would be related to employees' perceptions of injury risk and job safety [22]. Management acts and behaviors are an important area for intervention in improving safety climate [23]. A positive safety climate, shaped by supervisors' commitment and sight to safety, is related to improved communications about safety and human errors [24]. The psychosocial environment is broadly recognized to affect workers' well-being [25]. The positive relationships between dimensions of general work climate and safety climate have received empirical support [26]. Psychosocial conditions have been shown to be related to safety performance and to increase employees' health [27]. However, the association between safety climate and job stress has not been studied adequately. Also, less research has simultaneously focused on dimensions of job stress namely perceived job self-efficacy and perceived job helplessness. Therefore, we examined degrees of safety climate is associated with occupational stress and its dimensions by distributing a self-administered questionnaire to workers in various departments of Esfahan steel company.

Method

In the current research is used of a cross-sectional design. This research was administrated between Jan and Feb 2012 in Esfahan steel company. Esfahan steel company (Zob Ahan-e Esfahan) opened in late

1960s, based close to the cities of Fooladshahr and Zarrinshahr, Esfahan Province. Esfahan steel company (ESCO) is the first and largest manufacturer of constructional steel products in Iran (No=8300) [28]. In this research, in attention to the extent and distribution of the employees in the different parts of Esfahan Steel Company (Tohid Building, Navard part, blast furnace, steel making, coke, fire, railway, gas, oxygen plant, technical guidance etc.), the sample (n=200) was selected according to the stratified random sampling method. The strata are formed based on members' shared attributes or characteristics. A random sample from each stratum is taken in a number proportional to the stratum's size when compared to the population. Then these subsets of the strata are pooled to form a random sample. Then simple random sampling or systematic sampling is applied within each stratum. This often improves the representativeness of the sample by reducing sampling error. It can produce a weighted mean that has less variability than the arithmetic mean of a simple random sample of the population. The sample size was calculated using of SPSS-15, Following the procedure recommended by Molavi [29]. Given an, α level 0.05 and a power of 90 percent, the sample size required was estimated to be 200 subjects. Informed consent was obtained from each participant and was approved the research by the appropriately constituted ethics committees at Isfahan university. A total 189 (92%) workers returned the questionnaire. After translation of questionnaires of safety climate and occupational stress and it's dimensions, the original English along with Persian versions were presented to three cases of faculty members of psychology department and 4 individuals of Safety and mental health professionals; thus, about 22 versions of each scale were represented to sample of workers and they were asked to opine about their questions and their reliability. After studying preliminary opinion, the final scales were developed and were individually presented to workers. The following questionnaire was used:

Demographic factors. Five demographic factors, namely age, gender, marital status, education, and years of working experience, were included. Marital status was classified as married or not married (including divorced and widowed).

Safety climate. Workers' perceptions of safety climate were measured with the 50-item workplace safety scale (WSS) developed by Hayes, Perander, Smecko, et al. [30]. This instrument assesses employees' perceptions of work safety and measures five distinct constructs of safety climate, each with 10 items: (a) job safety perception (sample item: "Safety programs are effective"; $\alpha = 0.88$), (b) coworker safety perception (sample item: "Pay attention to safety rules"; $\alpha = 0.77$), (c) supervisor safety perception (sample item: "Enforces safety rules"; $\alpha = 0.91$), (d) safety management perception (sample item: "Responds to safety concern"; $\alpha = 0.89$), (e) safety programs and policies perception (sample item: "Effective in reducing injuries"; $\alpha = 0.81$). The total coefficient α score was .91 [31]. Participants responded on a 5-point scale ranging from 1- strongly disagree to 5- strongly disagree. Evidence of reliability of WSS, as administered to Iranian relevant populations, in this research, by Alpha Coefficient is 0.79 and by Split-half is 0.77. The validity coefficients of questions and rating scales of WSS are between 0.22 and 0.81 that all the validity coefficients are significant at $P<0.0001$. The perceived occupational stress [POS] was measured by Perceived Occupational Stress Scale (PSS) of Cohen, et al. [32], translated and validated in Persian. PSS is the most widely used psychological instrument for measuring the perceived stress. It measures the degree to which situations in one's life are rated as stressful. The items asked respondents how often they found their lives unpredictable, uncontrollable, and overloaded [33]. All the items we used were modified to ensure that they were appropriate for the industrial context and were included a number of direct questions about the current levels of experienced job stress. A sample item is ''in the last month in work environment, how often have you been angry because of the things that were outside of your control." The PSS was designed for using in community samples with

at least a junior high school education. The items were grasped easily, and the response alternatives were understood simply. Further, the queries are of a public nature and thus are relatively free of content specific to any subpopulation group.

The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked about how often they felt in a certain way. Scoring is based on a Likert-scale format from never (0) to very often (4). This scale has validity (reliability = 0.84, 0.85, 0.86 in three cases), high internal reliability (0.79=Cronbach's Alpha) and acceptable validity [34].

Also Demir and Orucu [35], in their study, mentioned the Cronbach's Alpha 0 .84 and its' correlation with the questionnaire "Public Health" 0.61. Exploratory and confirmatory factor analysis of the PSS showed that the scale consisted of two dimensions: Perceived job helplessness factor and perceived job self-efficacy [35].

Prior studies provide evidence for high internal reliability and validity of the scale [34,35]. Internal consistencies (Cronbach's α) in this study, in Iran, for the occupational stress, perceived job self-efficacy and perceived job helplessness was respectively reported 0.82, 0.70 and 0.88 which was excellent for these scales.

The participants of this research completed the questionnaires of WSS and POS in a one-hour meeting with the researchers or co-researchers. A covering letter explained the purpose of study, and that participation in the study was confidentially was guaranteed.

Respondents were asked to return completed questionnaires inside the sealed envelopes either to the person who had distributed them or directly to the research team.

The SPSS-15 was used to data and descriptive statistics was used to summarize and organize the data. This data were analyzed by correlation coefficients and Multivariate analysis.

Results

Almost the majority of participants were male. Ages ranged from 18 to 53; the mean age of the participants was 34 years (Mean±SD=5.58) and average work experience was 12 yr (Mean±SD=3.2 yrs) (see Table 1).

Part II: Descriptive statistics

Table 1 *Demographic characteristics of the sample members (N=189)*

		N (%)
Age	18 to 29 years	36
	30 to 41 years	36
	42 to 53 years	28
Sex	Male	90
	Woman	10
Marital status	Married	60
	Single	40
Education	Master degree	12
	University graduates	24
	High school graduates	60
	Primary school graduates and lower	4
Work experience	5 years and lower	36
	6 to 15 years	24
	16 to 25 years	24
	26 years and higher	16
Shift status	Shift	64
	Not shift	36

Mean, standard deviation and internal correlations of variables under study are presented in Table 2.

Table 2 *Mean, standard deviation variable and internal correlations under study*

				Correlations			
Variable	N	$\bar{X}$	SD	1	2	3	4
Occupational stress	189	27.12	±4 .95	1			
Perceived job self-efficacy	189	14.16	±3.27	0.49**	1		
Perceived job helplessness	189	12.95	±4 .37	0.59**	-0.19	1	
Safety climate	189	64.16	±8. 01	-0.39**	-0.01	-0.43**	1

*p<0.05, **p<0.01

As can be seen relationship between safety climate with occupational stress and perceived job helplessness was significant (P<0.01). There wasn't a significant relationship between safety climate and perceived job self-efficacy (P<0.05). We examined the data on safety climate, occupational stress and dimensions, and found that there was not only homogeneity of variances (F= 0.30, P>0.05), but also, the data were normally distributed. To assess predictive power occupational stress and its dimensions by safety climate were used of the canonical correlation method that is performed with Multivariate analysis. The results are presented in Table 3.

Table 3 *Multivariate analysis (MANOVA) of the predictor variable of safety climate based on the criterion variables of occupational stress, perceived job self-efficacy and perceived job helplessness*

	Effect	Value	F	Sig	Partial Eta Squared	No cent. Parameter	Observed Power
Safety climate	Pillai's Trace	0.19	5.70	.006	0.20	11.41	0.84
	Wilk's Lambda	0.81	5. 70	.006	0.20	11.41	0.84
	Hotelling's Trace	0.24	5.70	.006	0.20	11.41	0.84
	Roy's Largest oot	0.24	5.70	.006	0.20	11.41	0.84

As in table 3 is observed, safety climate predicted almost %20 of variance of occupational stress and its dimensions (P<0.01). Univariate analysis of variance on the criterion variables considering predictor variable of safety climate are presented in Table 4.

Table 4 *Univariate analysis of variance on scores of occupational stress, perceived job efficacy and perceived job helplessness according to predictive variable of safety climate*

Dependent Variable	Mean Square	F	Sig.	Partial Eta Squared	Observed Power
occupational stress	184.49	8.71	.005	0.15	0.82
Perceived job self-efficacy	0.16	0.01	.911	0.01	0.05
Perceived job helplessness	173.95	10.93	.002	0.19	0.90

As can be seen safety climate significantly predicted about 15% and 19% of the variance of variables of occupational stress and perceived job helplessness (P<0.01). Also, safety climate about %1 of the variance of job self-efficacy predicted but this effects wasn't statistically significant (P>0.05).

Discussion

In several countries occupational health and safety legislation actually requires organizations to act against psychosocial risk factors that cause occupational stress [36].

The current results indicated that safety climate significantly predicted occupational stress and perceived job helplessness. In addition, no statistical association was observed between

safety climate and perceived job self-efficacy. Less research was done about the relationship between safety climate and occupational stress. In one of the few studies carried out on this subject, Kirkcaldy et al. [37] showed that the safety climate and organization is effective in reducing the destructive effects of stress in incidence of accidents. The theory of demand-control (DC) describes occupational stress as developing from the structural or organizational aspects of the work environment and not the individual characteristics [38]. A part of this theory is interaction between the job demands is put on the employee and the management to coordinate those demands [39]. Employees involved in low control, high demands and low support positions, are in a higher danger of bodily and psychological harm from occupational stress [40]. As was noted, in the current research, the questionnaire of safety climate was consisted of five components: job safety perception, supervisor safety perception, coworker safety perception, management safety perception, safety program and policies perception [30]. Therefore, the components of safety climate can related with providing resources for managing job demands. Strong safety climate can providing support from peers and managers (support) by changing workers' perceptions of coworker, supervisor and management safety actions, safety program and policies; and the employees' perception of work demands would decrease (demand) by changing the perceptions of job safety. One aspect of organizational behavior that is very likely to have an influence on workers' perceptions on organizational safety and in turn influence safe work behaviors is the extent to which workers perceive their organizations as being supportive and caring [37]. A strong, positive safety climate is created when management, coworkers, and job tasks consistently encourage employees to carry out their jobs safely. A positive safety climate is an important part of a safe work environment [40]. Furthermore, research suggests that a positive safety climate, shaped by supervisors' positive interactions with employees and their committed and constructive approach to dealing with safety-related issues is related to improved communications about safety issues [18,24]. The supervisor support is a resource that reduce perceive of stressor in the workplace. Indeed supervisor support combination of assistance and expression sensational support by the supervisor to enhance the well being in employee. Supervisor support provides a psychological and physical resource that influences the psychological state of employee. Supervisors the pivotal role in the provision of work setting supports. Previous research indicated that level of burnout was reduced, if worker feel able to negotiate about work problems with Supervisor [41]. Fako [42] resulted that a successful accommodation and confrontation with the job demands removes the tangible effects of occupational stress on individuals.

Safety climate theory mentions that the roots of occupational stress may be found in the organizational safety climate. For example where an organization does not have a priority for employee physical and psychological health, we expect a high pressure, high demand, and high occupational stress. In other words, safety climate is a preeminent occupational stress risk element [43]. Pervious research suggests safety climate is a "cause of the causes" of occupational stress because, when it is low, high levels of psychosocial job stressors, such as role overload and work pressure, are also found [44]. As a leading indicator of these stress-related factors, safety climate has a vital role in stress prevention [45].

Safety climate can be conceptualized as a higher order or global factor involving perceptions of workplace safety-related attributes and the relative priority of safety with other competing goals (such as productivity and speed) [18]. So, employees do not spend all my time for doing faster their jobs and do their work with more patience. On the other side, employees with the perception of work pressure have more occupational stress and want to do their work rapidly; therefore, at the time of working with organization machinery and perhaps even at the time of their passing involve in more accidents.

The perception of employees about the company philosophy and its supervisor of production or safety, after the organization's policy towards safety, was the second important factor in predicting safety performance [46]. Zohar [47] stated that safety climate is a construct that reflects the true priority of safety and health within organizations and industrials.

About the components of occupational stress, safety climate significantly predicted perceived job helplessness. This matter clarifies that weak safety climate can be result to experience helplessness in workplace. According to this result, we can say that one of the causes of perceived helplessness in employees can be employees' weak safety climate in work environments and can decrease the perceived helplessness with promoting climate. This result can be justified with the construct of fatalism:

Fatalism is an obstacle to the adoption of safe working behavior [48]. Fatalism describes the belief that injuries are unavoidable and happen due to haphazard or fate [49]. It is negatively related with reporting job risk [50] and is positively related with self-care disorder [51]. Believe to fatalism have negatively influenced the acceptance of safe work practices [52]. The results of Patwary, O'Hare and Sarker [53] showed that fatalistic beliefs among personnel of an organization that attributed these events to "fate" reflecting their perceived lack of control over accidents and reveals a lack of organizational awareness that can occur within a climate of fatalism. Increasing employees' awareness and with changing safety climate can change this culture in organizations, and can improve employees' control on safety issues.

Also, safety climate didn't significantly predict perceived job self-efficacy. It should be noted it is not adequate that people realize the events are under their control and can take actions to prevent these accidents; they should also practically familiar with useful actions for protecting themselves. For example, conducting training exercises for familiarizing with the appropriate reactions in critical conditions can be effective in this field. Weidner and et al. [54] suggested that training should highlight the technical aspects of health and safety, and should include demonstration and hands-on procedures; and that integrated organizational support for implementation of health and safety practices is essential. In order to establish relationship between safety climate and perceived job self-efficacy also should be other conditions such as low-risk environments, safe equipment and machines, height organizational support, etc.

Conclusion

The findings of this research emphasize the importance of safety climate in predicting psychological distresses, occupational stress and coping with them. Safety intervention needs to focus on improving safety climate in organizations, as well as on the preventive coping methods against occupational stress, and these concepts influence the reduction of stress directly or indirectly. Showed that employees who conceive that their organization uses high commitment work actions, such as training and teamwork, reported higher levels of safety climate and fewer incidents in workplace. Recent researches suggest that management behaviors are a vital area for safety interventions in improving safety climate in organizations [18]. Helping managers to construct strong policies, practices and procedures to prevent occupational stress will improve safety climate [55].

The practical implications are best perceived in terms of amelioration of occupational stress. Improving safety climate as a reliable safety index, along the aspects described in the introduction, may decrease the health detrimental effects of job demands via the improved uptake of emotional resources by workers.

Finally, the safety climate construct has practical usefulness as an effective amelioration target for organizations to meet their task of care and occupational health and safety, legal and mental obligations. As managers are largely responsible for creating safety climate, we expect that safety climate yield positive effects on psychosocial work conditions and workers' well-being.

It is recommended that the future research

examine the effects of safety interventions to improve safety climate. Further, with designing these interventions and with more attention to them, we can affect one of the most important influential variables in incidence of occupational accidents. The present study needs to be replicated in different populations and needs more empirical support. Till then, the findings of the study should be interpreted with caution. Further, the cross-sectional design of the study and participants (i.e., a group of employee) exert some limitations on the generalization of the findings. Finally, the problems and limitations on the use of self-repotting instruments should not be overlooked.

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Study design: FK, MRKH
Data collection and analysis: FK
Manuscript preparation: MRKH, HKH

Conflict of Interest
"The authors declare that they have no competing interests."

References
1- kiani F, Samavatyan H, Pourabdian S, Jafari E. Predictive power of incidents reporting rate and its dimensions by job stress among workers' Isfahan steel company. *Iran J Pub Health*2011; 40: 105-112.
2- Brvr LR. Safety and health for engineers (safety in industry). GH Halvany translation.1st ed. Tehran; 2006: 45-47.
3- Jovanović J, Aranđelović M, Jovanović M. Multidisciplinar aspects of Occupational accidents and injuries. *Facta Universitatis*2004; 2(4): 325 – 333.
4- Benjamin OA. Fundamental principles of occupational health and safety. International Labor organization. *GENEVA*2001; 1-159.
5- Abbe OO, Harvey CM, Aghazadeh F. Modeling the relationship between occupational stressors, psychosocial/physical symptoms and injuries in the Construction Industry. *Int J Ind Ergonom*2011; 41(2): 106-17.
6- Dragano N, Moebus S, Jockel KH, Erbel R, Siegrist J. Two models of job stress and depressive symptoms results from a population-based study. *Soc Psychiatry Psychiatr Epidemiol*2007; 43(1): 72-8.
7- Stanfeld SA. The problem with stress: minds, hearts and disease. Int J epidemiol2002; (31): 1113– 16.
8- Ilies R, Dimotakis N, De Pater IE. Psychological and physiological reactions to high workloads: Implications for well-being. *Pers Psychol*2010; 63: 407-36.
9- Hobfoll SE. The influence of culture, community, and the nested-self in the stress process: advancing conservation of resources theory. *Appl Psychol- Int Rev*2011; 50: 337-70.
10- WHO. Protecting workers' health series. No.3: work organization & stress. institute of work, health & organizations, nottingham; 2005.
11- Conway PM, Campanini P, Sartoria S, Dotti R, Costa G. Main and interactive effects of shift work, age and work stress on health in an Italian sample of healthcare workers. *Appl Ergonom*2008; 39: 630–39.
12- Cox T, Griffiths AJ, Barlow CA, Randall RJ, Thompson LE, Rial-Gonzalez E. Organizational interventions for work stress: A risk management approach. Sudbury: HSE books; 2000.
13- Shanafelt TD. Enhancing meaning in work: a prescription for preventing physician burnout and promoting patient-centered care. *JAMA*2009; 302: 1338–40.
14- Muecke S. Effects of rotating night shifts: literature review. *J Adv Nurs*2005; 50: 433-39.
15- Dollard MF, Winefield HR, Winefield AH, Jonge JD. Psychosocial job strain and productivity in human service workers: a test of the demand-control-support model. *J Occup Organ Psychol*2000; 73: 501-10.
16- Glendon AI, Clarke SG, Mckenna E. Human safety and risk management, second ed. Crc press, boca raton, Florida; 2006.
17- Zohar D. Safety climate in industrial

organizations: theoretical and applied implications. *J Appl Psychol*1980; 65: 96–101.
18- Zohar D, Luria G. A multilevel model of safety climate: cross-level relationships between organization and group-level climates. *J Appl Psychol*2005; 90: 616–28.
19- Vinodkumar MN, Bhasi M. Safety climate factors and its relationship with accidents and personal attributes in the chemical industry. *Safety Sci*2009; 47: 659–67.
20- Zohar D, Tenne-Gazit, O. Transformational leadership and group interaction as climate antecedents: a social network analysis. *J Appl Psychol*2008; 93: 744-57.
21- Nielsen K, Lyngby Mikkelsen K. Predictive factors for self-reported occupational injuries at 3 manufacturing plants. Safety science monitor 11 article 7. Olsen, E., 2008a. What can Health care learn from the petroleum industry? a comparative sudy of safety climate differences healthcare ergonomics and patient safety (Heps 2008). Strasbourg.
22- Mearns K, Flin R. Risk perceptions in hazardous industries. *Psychologist*1996; 9(9): 401–04.
23- Zohar D, Luria G. The use of supervisory practices as leverage to improve safety behavior: a cross-level intervention model. *J Safety Res*2003; 34: 567-77.
24- Hofmann DA, Mark B. An investigation of the relationship between safety climate and medication errors as well as other nurse and patient outcomes. *Pers Psychol*2006; 59: 847-69.
25- Bond MA, Kalaje A, Markkanen P, et al. Expanding our understanding of the psychosocial environment: a compendium of measures of discrimination, harassment and work-family issues: NIOSH; 2007.
26- Neal A, Griffin MA, Hart PM. The impact of organizational climate on safety climate and individual behavior. *Safety Sci*2000; 34 (1–3): 99–109.
27- Parker SK, Axtell CM, Turner N. Designing a safer workplace. Importance of job autonomy, communication quality, and supportive supervisors. *J Occup Health Psychol*2001; 6 (3): 211–28.
28- Esfahan steel company. Profile of esfahan steel company. Cited 2012 January. Available at:URL:http://www.esfahansteel.com/steel_form.php?pge1=about&type=1&pge=profile.
29- Molavi H. SPSS 10-13-14 applied guidance in behavioral sciences. 2 ed. Isfahan: *Poyesh Andishe Publication*2007. [In Persian]
30- Hayes BE, Perander J, Smecko T, Trask J. Measuring perceptions of workplace safety: development and validation of the work safety scale. *J Safety Res*1998; 29: 145-61.
31- Milczarek M, Najmiec A. The relationship between workers' safety culture and accidents, near accidents and health problems. *Int J Occup Safety Ergonom*2004; 10: 25–33.
32- Cohen S, Karmark T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*1983; 24 (4): 385-96.
33- Cohen S. Perceived stress scale. Available at: URL: http://www.mindgarden.com/does/PerceivedStressscale.pdf; 2006.
34- Teresa Eve A. Associations of mindfulness, perceived stress, and health behaviors in college freshmen. (Doctoral dissertation). Available from Proquest database; 2008.
35- Demir A, Orucu MC. Psychometric evaluation of perceived stress scale for Turkish university students. *Stress & Health*2008; 25 (1): 103-09.
36- Ertel M, Stilijanow U, Cvitkovic J, Lenhardt U. Social policies, infrastructure and social dialogue in relation to psychosocial risk management. In: Leka, S., Cox, T. (Eds.), The European Framework for Psychosocial Risk Management. I-WHO, Nottingham, pp. 60–78, Available at: URL: http:// orm.sagepub.com/cgi/reprint/12/1/148; 2008.
37- Kirkcaldy B, van den Eeden P, Trimpop R, Martin T. Modeling psychological and work-situation processes that lead to traffic and on-site accidents. *Disaster Prev Manag*1999; 8 (5): 342-50.
38- Karasek R, Theorell T. Healthy work: stress, productivity and the reconstruction of working life. New York: basic books; 1990.
39- Vegchel NV, Jonge JD, Landsbergis PA. Occupational stress in interaction: The interplay between job demands and job resources. *J Organl Behav*2005; 26: 535-60.

40- Karasek R, Theorell T. Healthy work: stress, productivity and the reconstruction of working life. New York: basic books; 1990.
41- Ito H, Kurita H, Shiiya J. Burnout among direct-care staff members of facilities for persons with mental retardation in Japan. *MentRetard*1999; 37: 477–81.
42- Fako TT. Occupational stress among university employees in Botswana. *European J Soc Sci*2010; 15: 313-326.
43- Idris MA, Dollard MF, Coward J, Dormann C. Psychosocial safety climate: Conceptual distinctiveness and effect on job demands and worker psychological health. *Safety Sci*2012; 50: 19–28.
44- Law R, Dollard MF, Tuckey MR, Dormann C. Psychosocial safety climate as a lead indicator of workplace bullying and harassment, job resources, psychological health and employee engagement. *Accident Anal Prev*2011; 43: 1782–93.
45- Dollard MF, Karasek R. Building psychosocial safety climate: evaluation of a socially coordinated PAR risk management stress prevention study. In: houdmont, J, Leka, S. (Eds.), contemporary occupational health psychology: global perspectives on research and practice. wiley blackwell, chichester; 2010: 208-34.
46- Dìaz RI, Cabrera DD. Safety climate and attitude as evaluation measures of organizational safety, *Accident Anal Prev*1997; 29: 643–50.
47- Zohar D. Safety climate and beyond: A multi-level multi-climate framework. *Safety Sci*2008; 46: 376–387.
48- Lingard H. The effect of first aid training on australian construction workers' occupational health and safety knowledge and motivation to avoid work-related injury or illness. *Constr Manag Econom*2002; 20: 263–73.
49- Henning J, Stufft C, Payne S, Bergman M, Mannan M, Keren N. The influence of individual differences on organizational safety attitudes. *Safety Sci*2009; 47: 337-45.
50- Prati G, Pietrantoni L. Predictors of safety behavior among emergency responders on the highways. *J Risk Res*2012; 15: 405–15
51- Egede LE, Ellis C. Development and psychometric properties of the 12-item Diabetes Fatalism Scale. *J Gen Intern Med*2010; 25: 61–7.
52- Levin JL. Factors influencing safety among a group of commercial fishermen along the texas gulf coast. *J Agromedicine*2010; 15: 363–74.
53- Patwary MA, O'Hare WT, Sarker MH. Assessment of occupational and environmental safety associated with medical waste disposal in developing countries: a qualitative approach. *Safety Sci*2011; 49: 1200–7.
54- Weidner L, Gotsch AR, Delnevo C, Newman JB, McDonald B. Worker health and safety training: Assessing impact among responders. *Am J Ind Med*1998, 13(3): 241-6.
55- Zacharatos A, Barling J, Iverson RD. High-performance work systems and occupational safety. *J Appl Psychol*2005; 90 (1): 77–93.