

Attitude toward Safety Issues as Predictor of Job Stress and its Dimensions among Employees

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Abstract

Introduction: Evidence from a range of different data sources has shown that job stress is a significant problem in organizations and industries. Researchers have mentioned that attitude toward safety issues may predict psychological distresses in workplaces. The present study examined the relationship between attitude toward safety issues related to job stress and its dimensions among workers in Isfahan Steel Company.

Methods and Materials: This was a cross-sectional study. Sample consisting of 189 employees in Isfahan Steel Company in 2012 was selected according to the stratified random sampling method and responded questionnaires about demography characteristics, job stress and its dimensions (perceived job self-efficacy and perceived job helplessness) and safety attitudes. The data were analyzed using Multivariate and correlation techniques.

Results: The results showed that 1) there were significant relationships between attitude toward safety issues with job stress and perceived job helplessness ($p < 0.05$), 2) there was no significant relationship between attitude toward safety issues and perceived job self-efficacy ($p > 0.05$), 3) multivariate analysis showed that attitude toward safety issues variable significantly predicted respectively about 18% and 10% of the variance of variables of job stress and perceived job helplessness ($p < 0.5$).

Conclusions: Promoting safety attitudes can be an obstacle against the experience of job stress among employees.

Keywords: Attitude toward safety issues, job stress, perceived job self-efficacy, perceived job helplessness.

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Introduction

People working in the steel industry are identified with higher frequencies of occupational health issues, including musculoskeletal problems, than the total workforce. As it is a high-risk industry, there is a need to investigate factors affecting the occurrence of such accidents in order to be able to protect workers (1). First, providing a definition for occupational accident seems necessary. Occupational accident can be defined as an unwanted and unplanned event that is associated with the work and caused by unsafe acts and conditions or both, and might lead to immediate or delayed unpleasant effect as well as illness or death among a large number of workers (1, 2). Occupational accidents are considered one of the most important factors contributing to disability and absenteeism among workers. Since 1970, increasing efforts to prevent occupational accidents is carried out across the world, yet rate of occupational accidents is still high. Each year, almost 250 million occupational accidents causing injuries in 160 million workers are reported (3). Traditional methods to secure employees' safety concentrate 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 various studies (6,7) that show occupational stress is considered a strong predictor in controlling the occupational accidents. Occupational stress contributes various problems such as occupational disease, musculoskeletal disorders and other health issues in a work environment (8,9). Many researchers observed a significant relationship between the incident and employees stress levels (10,11). Stress is a response to stimuli and occurs if the resources of individuals are threatened or lost, or if resource investment does not produce desired

outcomes (12). Especially, the incidence of stress and its outcomes depends on how the resources fit in the individual demands (6). Individuals, when encounter with work requests and pressures not modified to their knowledge and ability, experience work stress (7). Work stress is regarded as an important topic in the field of work health (13) because of its negative impact on workers' health and safety (14). It results from Long-term exposure to workplace psychosocial risks, characteristics of the work environment, work design, and organizational management that potentially cause psychological and social damages (15).

Work stress in occupational setting may also result in a physical or psychological reaction such as absenteeism, turnover, and job burnout (16), cardiovascular and coronary artery disease (17), gastrointestinal complaints, health problems, fatigue, injuries at work (18), sleep disturbance (19), disorder in social activities and quality of time spent with family (20), headaches, nausea, muscle pains (21), job dissatisfaction (22), affective disorder (23), increased number of somatic symptoms such as neck and shoulder pain (24), type 2 diabetes in middle-aged women (25), susceptibility to disease (26), an increased risk of depression (27) and psychosomatic symptoms (28). Almost all the approaches to decreasing job stress concentrate on poor job/position design, poor job support, and high workload (29). However, it is believed that psychosocial dimensions of work environment such as safety attitudes of workers are likely to contribute to workers' experiences of occupational stress (30). Attitudes toward accidents and measuring and assessing such attitudes to evaluate the effectiveness of safety programs can be useful (31). The safety attitudes are the beliefs and emotions around the safety issues and reflect a sense of responsibility and commitment toward safety issues (32, 33). Employees' attitudes can act as a mediator between

safety climate and accident occurrence and may indirectly influence the individuals' safety behaviors and performance (34). Safety attitude is related to other variables that associate with the occurrence of accidents such as safety compliance practices (35), risk behavior (36), sensation seeking (37), breaking safety rules (38) and fatalism (39). Nonetheless, the association between attitude toward safety issues and job stress has not adequately been studied in Iran and in the world. Also, few researches have simultaneously focused on job stress and its dimensions which are perceived job self-efficacy and perceived job helplessness. Therefore, we examined degrees of attitude toward safety issues associated with job stress and its dimensions through distributing a self-administered questionnaire to the workers in various departments of Isfahan Steel Company.

Methods and Materials

Participants

The current research applied a cross-sectional design. This research was administrated from January to February 2012 in Isfahan Steel Company. Isfahan Steel Company (Zob Ahan-e Isfahan) opened in late 1960s and is located near the cities of Fooladshahr and Zarrinshahr in Isfahan Province. Isfahan Steel Company (ESCO) is the first and largest manufacturer of constructional steel products in Iran (N=8300) (40). In this research, considering the extent and distribution of the employees in the different parts of Isfahan 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. In stratified random sampling, 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. These subsets of the strata are then 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 with less variability than the arithmetic mean of a simple random sample of the population. The sample size was calculated using SPSS 15, following the procedure recommended by Molavi [41]. Given an α level 0.05 and a power of 90%, the sample size required was estimated to be 200 subjects. Informed consent was obtained from each participant and the research was approved by the appropriately constituted ethics committees at Isfahan University. A total 189 (92%) workers returned the questionnaire.

Measurements

After translating questionnaires of safety climate and occupational stress and its dimensions, the original English along with Persian versions were presented to three cases of faculty members of psychology department and 4 individuals at safety and mental health professionals. Thus, about 22 versions of each scale were represented to sample of workers and they were asked to opine on 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, the five demographic factors, included age, gender, marital status, education, and years of working experience. Marital status was classified as married, single, divorced and widowed.

Attitude toward safety issues, the instrument used to collect data on the attitude toward safety issues was a self-reported questionnaire of Muntinu (42). This questionnaire is the commonly used method for collecting attitudinal data, and was therefore, selected for this research. This questionnaire was translated into and validated in Persian and its items were amended by safety and health specialists to

suit the steel industry. The safety attitude inventory is a 66-item and self-report scale that measures attitude factors related to accidents. The thirteen components of attitudes toward safety issues are listed in Table 2. A sample item is "I do not use equipment that I feel is unsafe," that is related to safety consciousness factor and is presented in a multiple-choice format. The statements are arranged to reflect agreements' intensity from strongly disagree (0) to strongly agree (4). Muntinu (42) concluded that this inventory has high internal reliability (for all factors, Cronbach's Alpha takes values between 0.70 and 0.80) and has a good validity. In this research, evidence of reliability of this inventory, as administered to the Iranian relevant populations, was calculated by Alpha Coefficient 0.78 and by Split-half 0.80 (for all the factors, Cronbach's Alpha takes values between 0.56 and 0.87). The validity coefficients of questions and components of safety attitude with other questionnaires of safety attitude are between 0.24 and 0.79, and all the validity coefficients are significant at $p < 0.0001$.

The perceived job stress (PSS) was measured by Perceived Job Stress Scale (PSS) of Cohen, et al. (43), translated into, 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 (44). All the items we used were modified to ensure that they were appropriate for the industrial context and 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 got angry because of the things out 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 the feelings and thoughts during the previous month. In each case, the respondents are asked on how often they felt in a certain way. Scoring was based on a Likert-scale format from never (0) to very often (4). This scale has a reliability of .84, .85, .86 in the three cases, high internal reliability (0.79=Cronbach's Alpha) and an acceptable validity (45). Also Demir and Orucu (46) 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 (46). Prior studies provide evidence for high internal reliability and validity of the scale (45, 46). Internal consistencies (Cronbach's α) in this study, in Iran, for the occupational stress, perceived job self-efficacy and perceived job helplessness was respectively 0.82, 0.70, and 0.88, which were excellent for such scales.

The participants of this research completed the questionnaires of safety attitude and job stress in a one-hour meeting with the researchers or co-researchers. A covering letter explained the purpose of the study, and that participation in the study was confidentially guaranteed. The 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 Statistical Package for the Social Sciences (SPSS) version 15 was used to analyze the data. Also, descriptive statistics was used to summarize and organize the data, and were analyzed by correlation coefficients and multivariate analysis.

Table 1: Components of attitude toward safety issues

Component	Explanation
Work conscientiousness	Refers to one's sense of competence and responsibility.
Fatalism	Refers to views of importance and controllability of safety.
Safety consciousness	Refers to one's awareness of safety issues.
Leadership	Refers to satisfaction with the leadership (influence, inspirational motivation, intellectual stimulation, individual consideration).
Role overload	Refers to perceptions about whether there is high workload in one's job (i.e. too many hours worked per person).
Work pressure	Refers to work pace and availability of resources (i.e. time and workplace) available for the job.
Job safety perception	Refers to a global perception over how safe one's job is.
Supervisor safety perception	Refers to perceptions about one's supervisor behavior related to safety.
Coworker safety perception	Refers to perceptions about one's coworkers behavior related to safety.
Management safety perception	Refers to perceptions about one's company management attitudes and behaviors related to safety.
Safety program and policies perception	Refers to perceptions about the safety program and policies in place.
Interpersonal conflicts at work	Refers to the level respondents get along with others at work.
Job involvement	Refers to beliefs regarding the importance the work plays in one's life.

Adapted for Muntinu (39), P. 22-23

Results

Part I: Demographic characteristics of participants

Almost the majority of participants were male because in this study, the main occupational groups were at production line. Age groups ranged from 18 to 53; the mean age of the participants was 34 year. As it can be seen, the relationships between attitudes toward safety issues with job stress and job helplessness are significant ($p < 0.05$). There was no significant relationship between attitudes toward safety issues and job self-efficacy ($p > 0.05$).

Part III: Multivariate Analysis

To assess predictive power job stress and its dimensions by attitude toward safety issues canonical correlation method was used. As it can be seen, attitude toward safety issues variable significantly predicted respectively about 18% and 10% of the variance of variables of job stress and perceived job helplessness ($p < 0.05$). Also,

($SD = 5.58$ year old) and average work experience was 12 years ($SD = 3.2$ yrs) (see Table 2).

Part II: Descriptive statistics

Mean, standard deviation and internal correlations of variables under the study are presented in Table 3.

used that is performed with Multivariate analysis. The results are presented in Table 4.

As observed in table 4, attitude toward safety issues predicted almost 18% of variance of job stress and its dimensions ($p < 0.01$). Univariate analysis of variance on the criterion variables considering predictor variable of attitude toward safety issues are presented in Table 5.

attitude toward safety issues predicted about 5% of the variance of job self-efficacy which is not statistically significant ($p > 0.05$).

Table 2: Demographic characteristics of the sample members (N=189)

		Frequency	Frequency percentage (%)
Age	18 to 29 years	68	36%
	30 to 41 years	68	36%
	42 to 53 years	53	28%
Sex	Male	170	90%
	Woman	19	10%
Marital status	Married	113	60%
	Single	76	40%
Education	M.Sc. (M.A.) degree or higher	22	12%
	B.Sc. (B.A.) degree	45	24%
	High school graduates	113	60%
	Primary school graduates and Lower	9	4%
Work experience	5 years and lower	68	36%
	6 to 15 years	45	24%
	16 to 25 years	45	24%
	26 years and higher	31	16%
Shift status	Shift	120	64%
	Not shift	69	36%

Table 3: Mean, standard deviation variable and internal correlations under the study

Variable	N	\bar{X}	SD	Correlations			
				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	
Attitude toward safety issues	189	208.21	17.45	-0.43**	-0.23	-0.31*	1

*p<0/05, **p<0/01

Table4: Multivariate analysis (MANVOA) of the predictor variable of attitude toward safety issues based on the criterion variables of job stress, perceived job self-efficacy, and perceived job helplessness

Effect	Value	F	df	Error df	Sig	Partial eta squared	No cent. Parameter	Observed power	
Stress	Pillai's Trace	0.18	5.27	2	186	.009	0.18	10.55	0.81
	Wilk's Lambda	0.81	5.27	2	186	.009	0.18	10.55	0.81
	Hotelling's Trace	0.22	5.27	2	186	.009	0.18	10.55	0.81
	Roy's Largest Root	0.22	5.27	2	186	.009	0.18	10.55	0.81

Table5: Univariate analysis of variance on scores of job stress, perceived job efficacy and perceived job helplessness according to predictive variable of attitude toward safety issues

Dependent variable	Sum of squares	df	Mean square	F	Sig.	Partial eta squared	Observed power
Job stress	219.44	1	219.44	10.73	.002	0.18	0.89
Perceived job self-efficacy	28.43	1	28.43	2.75	.104	0.05	0.36
Perceived job helplessness	89.89	1	89.89	5.09	.02	0.10	0.68

Discussion

The current results indicated that attitude toward safety issues significantly predicted job stress and perceived job helplessness. In addition, no statistical association was observed between attitude toward safety issues and perceived job self-efficacy.

Few researches are done on the relationship between attitude toward safety issues and job stress. In one of the few studies carried out on this subject, Dickety and et al. (30) showed the role of safety attitudes and climate in controlling the job stress weight. In addition, according to Kirkcaldy et al. (47), the safety climate in an organization, is effective in reducing the destructive effects of stress in incidence of accidents.

A part of the theory of demand-control (DC) is interaction between the job demands put on the employee and the management to coordinate such demands (48, 49). Employees involved in low control, high demands and low support positions, are in a higher danger of bodily and psychological harm from job stress (29). As noted, in the current research, the questionnaire of attitude toward safety issues consisted of thirteen components: work conscientiousness, fatalism, leadership, safety conscientiousness, role overload, work pressure, job safety perception, supervisor safety perception, coworker safety perception, management safety perception, safety program and policies perception, interpersonal conflicts at work and job involvement (42). Therefore, the components of safety attitude can be related to providing resources for managing job demands. Strong safety attitudes can provide support to peers and managers (support) by changing workers' perceptions toward coworkers, supervisors and management safety actions, safety program and policies, interpersonal conflicts at work and job involvement. Employees might feel more confident to overcome some barriers in the

workplace (control) by changing work conscientiousness, fatalism and safety conscientiousness; and the employees' perception toward work demands would decrease (demand) by changing the perceptions of role overload, work pressure and job safety. Fako (50) concluded that a successful accommodation and confrontation with the job demands removes the tangible effects of job stress on individuals.

Furthermore, a worker's perception of job stressors may partially be a joint function of attitudes (51). Individuals who have positive attitudes toward the safety issues are more likely to believe the predictability of accidents and take protective actions to avoid them, so they are less likely to believe that these stressful situations cannot be controlled. Mclain (52) found that employees' confrontation with risky environments that threatens their safety and health affects their job stress levels; which mean that a perception of increased harm leads to dissatisfaction and discomfort that in turn increases the job stress among the employees. The perceived risk significantly predicts stress-related symptoms.

As for job stress, attitude toward safety issues significantly predicted perceived job helplessness. This clarifies that individuals with low perceived helplessness have better attitudes toward safety issues. Accordingly, one of the causes of perceived helplessness among employees can be attributed to employees' weak attitudes toward safety issues, which can decrease the perceived helplessness with promoting their safety attitudes. This result can be justified with two constructs of fatalism and locus of control:

Fatalism is an obstacle to the adoption of safe working behavior (53). Fatalism describes the belief that injuries are unavoidable and happen due to haphazard or

fate (54). It is negatively related with reporting job risk (55) and is positively related with self-care disorder (56). Believe to fatalism have negatively influenced the acceptance of safe work practices (57). The results of a study done by Patwary, O'Hare and Sarker (58) showed that fatalistic beliefs among personnel of an organization that attribute these events to "fate" reflects their perceived lack of control over accidents and reveals a lack of organizational awareness that can occur within a culture of fatalism. Through increasing the awareness of employees and changing their attitudes toward safety issues, this culture can change in organizations, and employees' control on safety issues can be improved.

Employee with internal locus of control tends to believe that they can prevent accidents and injuries. In contrast, employee with external locus of control tends to believe that accidents and injuries are due to forces outside their control, such as fate, or fatalism (59). External locus of control has positive correlation with helplessness (60). Individuals with internal locus of control have better attitudes toward safety issues, thus the perception of helplessness in them more likely returns to lack of awareness. In contrast, individuals with external locus of control have weaker attitudes toward safety issues (61), to decrease helplessness in them, their attitudes toward safety issues should be promoted early.

Similarly, attitude toward safety issues did not significantly predict perceived job self-efficacy. It should be noted that it is not adequate for people to realize the events are under their control and can take actions to prevent these accidents; they should also be practically familiar with useful actions for protecting themselves. For example, conducting training exercises to familiarize them with the appropriate reactions in critical conditions can be effective in this

field. Weidner et al. (62) 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.

Implications for well-being

The findings of this research emphasize the importance of safety attitudes in predicting job stress and coping with them. Safety intervention needs to focus on improving safety attitudes in organizations, as well as on the preventive coping methods against job stress, and these concepts influencing the reduction of stress directly or indirectly. Zacharatos et al. (63) showed that employees who conceive that their organization uses high commitment work actions, such as training and teamwork, reported better levels of safety attitudes and fewer incidents in workplace. Recent researches suggest that management behaviors are a vital area for safety interventions in improving safety attitudes and climate in organizations (63, 64).

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

Finally, the safety attitude construct has practical of advantage 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 promoting safety attitudes, we expect that prompting safety attitudes 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 attitudes. In addition, with designing these interventions and with more attention paid to them, we can affect one of the most important influential variables in incidence of occupational accidents.

Conclusions

The findings of this research emphasize the importance of attitude toward the safety issues in predicting job stress and coping with them. Safety intervention needs to focus on the increase of safety issues awareness, as well as on the prevention methods coping with them, and these concepts influence the reduction of job stress directly or indirectly. It is recommended that the future research examine the effects of safety interventions on decreasing job stress. 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. Until then, the findings of the study should be interpreted with caution. Additionally, the cross-sectional design of the study and the 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-reporting instruments should not be overlooked.

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