G. Bahrami Azar, S. Givehchi, S. Vosoughi*

WORKFORCE SAFETY CULTURE, JOB STRESS AND JOB SATISFACTION IN AN AUTOMOTIVE INDUSTRY

UDK 681.5:159.944
RECEIVED: 2022-02-08
ACCEPTED: 2022-12-06

SUMMARY: Safety culture as an organizational factor has an essential role in preventing occupational injuries and diseases. In this descriptive-analytical study, the relationship between organizational safety culture, job stress and satisfaction has been investigated to have a better understanding of the effect of this organizational factor on employee job stress and satisfaction. Three valid tools, including the Safety culture questionnaire, standard job stress questionnaire (JSQ), and Standard Minnesota Job Satisfaction Questionnaire, were used. The study population consisted of 210 workers working in 13 production halls of an automotive industry who were selected by a simple random sampling method. After data collecting, SPSS software version 22 was used for data analysis, and AMOS software version 24 was used for confirmatory factor analysis. The results show a significant relationship between trained and untrained groups and safety culture (p = 0.002), job stress and education level (p = 0.006), and job satisfaction and education level (p = 0.011). Safety culture score was significantly different in trained and untrained groups (p = 0.002). Factor analysis showed that a workplace with higher safety culture could lead to less job stress and more job satisfaction in employees. Based on the results, safety culture affects job satisfaction and job stress. Also, we found safety and health education is one of the factors affecting safety culture, job satisfaction, and stress. Safety culture could result in less job stress and more job satisfaction in employees. Improving it will improve the safety and health situation and ultimately increase job satisfaction and reduce job stress.

Key words: *organizational factor, safety culture, job stress, job satisfaction, automotive industry*

INTRODUCTION

Safety culture is defined as the way in which safety is managed in a workplace. It is the combination of beliefs, perceptions and attitudes of employees toward the safety of workers and the overall safety of the work environment.

*Ghasem Bahrami Azar, M.Sc., (bahrami.hse@gmail.com), College of Engineering, Faculty of Environment, University of Tehran, Tehran, Iran, Saeed Givehchi, Ph.D., (givehchi@ut.ac.ir), College of Engineering, Faculty of Environment, University of Tehran, Tehran, Iran, Shahram Vosoughi, Ph.D, (sh_vosoughi@yahoo.com), (corresponding author), Department of Occupational Health Engineering, Faculty of Health, Occupational Health Research Center, Iran University of Medical Sciences, Tehran, Iran.

The automotive industry is considered as one of the most critical industries in the manufacturing sector with a large operating workforce. The automotive industry in Iran has also grown significantly. In this industry, various activities are performed in different halls. This industry uses a variety of heavy machinery, and the management policies governing are different. Also, in terms of the number of production vehicles per hour, significant workforce, scheduling of work cycles, and such issues, this industry has always had significant occupational injuries and diseases *(Clarke, 2006, Vosoughi et al., 2020).*

The organization's social environment directly affects organizational risk management practices,

leading to personal injuries or catastrophe *(Cooper et al., 2019a, Antonsen, 2017)*. The workers with a negative perception of the safety situation of the organization with high workload and work pressure tend to perform unsafe actions, which in turn increases the risk of accidents. Similarly, it has been shown that job insecurity, anxiety, and stress in workers reduce safety motivation and safety compliance with instructions and procedures. The rate of accidents can be recorded in this workplace, and employees are higher. On the other hand, workers with a positive perception of the safety of their workplace have recorded fewer accidents *(Gyekye, 2005)*. Promoting organizational and occupational safety is possible through improving the organization's safety culture. Safety culture through preventing high-severity events and cases with high frequency and low severity (such as personal injuries, etc.) improve the organization *(Cooper et al., 2019b)*. Safety culture has been investigated in various studies. The concept of safety culture originates from the concept of organizational culture *(Choudhry et al., 2007a)*. There are several types of cultures side-by-side in an organization, usually related to different units, departments, hierarchical layers, and occupations. In an organization, these cultures are not separate from each other but are clearly influenced by the national culture and specific characteristics of a country, region, sector, industry, or occupation, and at the same time affect those in an organization *(Antonsen and management, 2009)*. The International Nuclear Safety Group (INSAG) introduced the term safety culture in its 1986 INSAG-1 report on the Chernobyl disaster. There are several definitions of safety culture today *(Choudhry, 2007b, Seňová and Antošová, 2014)*. The International Atomic Energy Agency provided the first definition of safety culture as a set of characteristics and attitudes in the organization and individuals that is based on the importance, attention, and priority to safety *(Shirali et al., 2018, Boughaba et al., 2014)*. Studies have emphasized this definition of safety culture that safety culture is defined as the product of interactions between individuals (psychological factors), job (behavioral factors), and organization (situational factors) *(Marcatto et al., 2016a, Cooper, 2000)*. Fernández-Muñiz et al. *(2007)* defined safety culture as a part of organizational culture related to individuals, work, and organizational characteristics that can affect their health and safety. Recent studies have also shown that organizational factors such as information, commitment, and participation directly affect the maturity of safety culture in the organization *(Moreira et al., 2021)*. The objective of creating a positive safety culture in the organization is to create an environment where employees know the risk of the workplace and ways to protect it. Safety culture is also an important management tool for investigating employees' beliefs, attitudes, and behaviors about safety *(Fernández-Muñiz et al., 2007)* and is considered as an important index of the safety performance of the organization *(Guldenmund, 2000, Kalteh et al., 2018, Chen et al., 2018)*. In modern organizations, in addition to paying attention to safety and safety culture, they also consider job stress and the satisfaction of their employees as two important issues in the workplace *(Hoboubi et al., 2017)*. The researchers in various studies have investigated organizational culture, job stress, workplace safety climate, and job stress and satisfaction *(Strahan et al., 2008, Gyekye, 2005, Williams et al., 2007)*. However, according to the study, no study was found to investigate the relationship between culture, especially the organization's safety culture, on job stress and satisfaction of workers.

Work-related stress is one of the significant concerns about occupational safety and health *(Marcatto et al., 2016b)*. Job stress and satisfaction are two important factors that affect the efficiency of the workforce *(Hoboubi et al., 2017)*. Job stress is defined as nervousness or work-related anxiety that affects a worker's mental and physical health, which affects a person's behavior *(Lu and Kuo, 2016)*. Also, many studies have shown a relationship between job satisfaction and individuals' health, and job satisfaction is an important factor for workers' health *(Faragher et al., 2013)*. Job satisfaction is a positive or enjoyable reaction from job evaluation, success, or experience *(Gul et al., 2018)*. Job stress is considered harmful when there is a mismatch between job requirements and the ability of employees *(Hoboubi et al., 2017)*. According to recent studies, job stress causes 50-60% of all lost workdays *(Clegg, 2001a, Golubic et al., 2009)* and affects one in four workers, according to the statistics. Stress is a problem for everyone at every level of the job. In various companies, resolving stressors is very

useful because the consequences of the effect of job stress not only cause financial loss due to absenteeism, mistakes, poor performance and accidents of employees but also cause the company to lose its reputation as a result of poor working conditions *(Seňová et al., 2014)*. Most researchers believe that workplace factors can cause job stress *(Clegg, 2001b, Hoboubi et al., 2017)*. These factors are divided into physical (related to poor safety and ergonomic conditions) and psychosocial (including work design, organization and management). These factors, along with the social structure of the workplace, can harm individuals and threaten their health *(Hoboubi et al., 2017)*. Poor communication, the culture of blame and punishment due to mistakes and accidents, work pressure and excessive expectations from workers as organizational factors can affect job stress *(Seňová et al., 2014)*. These stressors affect individuals' health through a physiological, emotional, behavioral and cognitive patterns. Stress can affect the conditions, cultures, norms and value systems of different societies *(Gharibi et al., 2016)*. Job stress in the workplace usually affects individual and organizational issues such as individuals' behaviors, mental status, as well as their physical performance and organizational commitment *(Hoboubi et al., 2017)*. Lingard and Yesilyurt identified job stress as a vital factor influencing human safety behavior *(Lingard and Yesilyurt, 2003)*. The organizational characteristics of a structure can greatly affect job stress and satisfaction *(Platis et al., 2015, Seňová et al., 2014)*. Job satisfaction is also affected by workplace conditions and safety. A work environment with a high risk of accidents and injuries can reduce the level of job satisfaction of employees. In addition, job stress in a high-risk workplace negatively affects job satisfaction and is related to the rate of employee resignation *(Malek et al., 2009)*.

Regarding the importance of organizational safety culture in preventing injuries caused by work in this study, researchers have investigated the organization's safety culture. Also, to better understand the effect of this organizational factor on employee job stress and satisfaction as two vital and effective factors on their job performance, the relationship between organizational safety culture and job stress and satisfaction has been investigated.

In this study, the following hypotheses were considered:

H1: Safety culture has a significant relationship with job satisfaction.

H2: Safety culture has a significant relationship with lack of job stress.

H3: Lack of job stress has a significant relationship with job satisfaction.

MATERIALS AND METHODS

The present study is a descriptive-analytical study conducted in 2018 in an automotive company.

Tools

Demographics and work situation characteristics questionnaire

In this study, demographic information and job characteristics, including age, gender, work experience, shift work, marital status and accident experience in a recent year, and safety and health education history, were measured by a question.

Safety culture questionnaire

Safety culture is usually evaluated using a questionnaire. The analytical or psychological / psychometric approach is the most common and dominant approach for safety culture evaluation *(Guldenmund, 2010, Antonsen and management, 2009, Hopkins, 2006)*. In such surveys, employees are asked to complete a specific standard questionnaire to provide their perception or opinion (or shared perception among colleagues) about specific safety aspects. The information obtained are processed and analyzed and provides an overview of the category studied, which in this study is safety culture. Since the culture of any organization is influenced by the national culture and specific characteristics of a country, region, sector, industry or occupation *(Antonsen and management, 2009)*. Therefore, a native questionnaire developed by Parkestani et al. *(2010)* was used to investigate safety culture in this study. This questionnaire has five dimensions of management commitment, information exchange level, training, workplace and safety priority that; all dimensions of the questionnaire are positively correlated with

each other. The reliability and validity of the safety culture questionnaire used were investigated and confirmed. The reliability of the questionnaire was confirmed with Cronbach's alpha coefficient of 0.96. Also, this questionnaire had 56 questions, 17 of which were inverted, and scoring the questions of this questionnaire was based on the Likert scale from 1 (strongly disagree) to 5 (strongly agree) *(Nouri Parkestani et al., 2010, Mahdinia et al., 2017)*.

Job stress questionnaire

In this study, standard job stress questionnaire (JSQ) provided by the British Health and Safety Executive (HSE) was used to evaluate job stress. This questionnaire has been used in various studies and has high validity *(Edwards et al., 2008, Balducci et al., 2015)*. This questionnaire has also been used in various studies in Iran and is valid. The standard job stress questionnaire consists of 35 questions and has seven components: demand, control, peer support, manager and supervisor support, communication, role, and change. The questions of this tool are on a five-option Likert scale. In order to score this questionnaire, each phrase should first be scored from 1 to 5 (never, rarely, sometimes, often, and always) *(Azad and Gholami, 2011)*.

Job satisfaction questionnaire

Standard Minnesota Job Satisfaction Questionnaire was used in this study. This questionnaire has 19 questions and its purpose is to investigate five dimensions of job satisfaction, including payment system, type of job, opportunities for advancement, organizational climate, leadership style and physical conditions. This questionnaire has been used in various studies and has high validity *(Buitendach and Rothmann, 2009, Khosrozadeh et al., 2016, Hancer and George, 2003)*. This questionnaire is based on the 5-option Likert scale (strongly disagree, disagree, have no opinion, agree, and strongly agree) *(Khosrozadeh et al., 2016)*.

Sample and data collection

The study population consisted of 210 workers working in 13 production halls of an automotive industry located in Tehran, Iran, who were selected by simple random sampling method.

Data analysis

SPSS software version 22 was used for data analysis and AMOS software version 24 was used for confirmatory factor analysis. Therefore, first the data were entered SPSS software and then described using descriptive methods. Then, the normality of quantitative data was investigated and confirmed using the Kolmogorov-Smirnov test. Therefore, the independent t-test was used to compare quantitative variables in two independent groups and analysis of variance was used to compare several independent groups. Also, confirmatory factor analysis was used to investigate and confirm the relationships of the proposed model. The significance level was considered 0.05 in all tests.

RESULTS

Demographic characteristics of workers

After completing the questionnaire by the participants, a preliminary review of the questionnaires was performed. A total of 190 participants completed the questionnaires and another 20 questionnaires were incomplete and excluded from the study. Table 1 shows the demographic information of the surveyed personnel and shows that 71.5% of the participants in the study have a Diploma and below, 9.5% had an associate degree, and about 19% of them have a bachelor's degree or higher. All participants in this study were male and their mean and standard deviation of age and work experience were 45.23 ± 3.67 and 12.95 ± 3.73 years, respectively. Also, 83.2% of the participants were shift workers.

Table 1. Demographic information of the participants

Tablica 1. Demografski podaci o sudionicima

Variables		F (%)-	Mean Safety Culture	Mean difference	sig	Mean Job stress	Mean difference	sig	Mean Job satisfaction	Mean difference	sig
Age	21-35	36 (18.9)	176.47	-	0.29	117.53	-	0.62	48.82	-	0.021
	36-50	149 (78.4)	179.07			115.83			51.62		
	>51	5 (2.7)	205.25			119.50			67.70		
Marital status	Single	28 (14.7)	172.92	7.42	0.331	116.65	0.51	0.826	50.22	1.55	0.607
	Married	162 (85.3)	180.34			116.14			51.77		
Education level	Diploma and sub-diploma	136 (71.5)	176.00	-	0.146	116.73	-	0.577	51.29	-	0.607
	Associate Degree	18 (9.5)	192.00			114.00			54.44		
	Bachelor's degree and higher	36 (19)	184.52			115.56			50.94		
Work experience	1-10	14 (7.3)	160.00	-	0.107	118.18	-	0.77	43.69	-	0.039
	11-20	158 (83.2)	180.74			116.19			51.57		
	>21	18 (9.5)	182.60			115.13			69.94		
Shift-work	Yes	158 (83.2)	176.72	16.86	0.026	116.28	-	0.866	50.30	7.53	0.008
	No	32 (16.8)	193.58			115.89			57.83		
Safety training status	Yes	156 (82.1)	183.11	22.55	0.002	9.01	1.40	0.006	52.69	7.14	0.011
	No	34 (17.9)	160.56			7.61			45.55		
Experience the accident in the last 12 months	Yes	71 (37.4)	178.79	0.73	0.897	117.31	1.75	0.313	50.49	1.71	0.436
	No	119 (62.6)	179.52			115.56			52.20		

After investigating the normality of the data, as shown in Table 1, the results of the independent t-test showed no significant relationship between the three variables of safety culture, job stress and satisfaction, and marital status (Table 1). Also, after testing the assumptions of one-way analysis of variance (ANOVA), analysis of variance showed that the safety culture score at the level of education had no significant relationship ($p = 0.146$). A significant relationship was found between trained and untrained groups and safety culture ($p = 0.002$), job stress and education level ($p = 0.006$) and job satisfaction and education level ($p = 0.011$). The mean values and standard deviation of safety culture and its dimensions, job satisfaction and its dimensions and job stress and its dimensions are given in Tables 2, 3 and 4, respectively, indicating that among the dimensions of safety culture, management commitment had the highest score (83.39 ± 18.58) and then the workplace had the lowest score (15.96 ± 4.62). Also, the total mean of all safety culture dimensions was (178.36 ± 39.28). Among the dimensions of job satisfaction, the type of job had the highest score (11.98 ± 3.94) and the organizational climate (6.23 ± 2.14) had the lowest score. Also, among the dimensions of job stress, the demand obtained the highest score (27.19 ± 6.51) and the change had lowest change score (8.67 ± 2.67). Safety culture did not differ significantly between different age groups, education levels and groups with different work experience (Table 1). Safety culture was significantly different between groups with and without accident ($p = 0.048$). But safety culture score was significantly different in trained and untrained groups ($p = 0.002$). In addition, a significant difference was in safety culture score between work shift and non-shift groups ($p = 0.026$). Job stress was not significantly different between different age groups, education levels and groups with different work experience (Table 1). But job satisfaction was significantly different between different age groups. The results of post hoc test showed a significant difference between the age group of 21-35 years and the age group over 51 years ($p = 0.006$), the age group 36-51 years and the age group over 51 years ($p = 0.013$), the age group more than 51 years and the age group of 21-36 years ($p = 0.006$) and 21-35 years ($p = 0.0013$) and the mean job satisfaction. In addition, job satisfaction was significantly different in groups with different work experiences ($p = 0.039$). The post hoc test results showed that this difference was between the group with 1-10 years of work experience and the group with more than 20 years of work experience ($p = 0.011$).

Table 2. Safety culture and its dimensions

Tablica 2. Sigurnosna kultura i njezine dimenzije

Safety culture dimensions	M ± SD
Management commitment (25 questions)	83.39 (18.58)
Information exchange (10 questions)	25.61 (6.33)
Education (10 questions)	32.85 (7.02)
Workplace Environment (6 questions)	15.96 (4.62)
Safety priority (5 questions)	20.55 (2.73)
Total mean of safety culture (56 questions)	178.36 (39.28)

Table 3. Job satisfaction and its dimensions

Tablica 3. Zadovoljstvo poslom i njegove dimenzije

Job satisfaction dimensions	M ± SD
Payment system (3 questions)	6.93 (2.78)
Type of job (4 questions)	11.98 (3.94)
Advance opportunity (3 questions)	6.94 (3.30)
Organizational climate (2 questions)	6.23 (2.14)
Leadership style (4 questions)	11.22 (2.95)
Physical conditions (3 questions)	8.43 (2.97)
Total mean of job satisfaction (19 questions)	51.73 (18.08)

Table 4. Job stress and its dimensions

Tablica 4. Stres na poslu i njegove dimenzije

Job stress dimensions	M ± SD
Demand (8 questions)	27.19 (6.51)
Control (6 questions)	17.63 (4.51)
Peer support (4 questions)	15.72 (3.82)
Manager and supervisor support (5 questions)	15.01 (3.06)
Communication (4 questions)	11.62 (2.56)
Role (5 questions)	19.69 (2.81)
Change (3 questions)	8.74 (2.67)
Total mean of job stress (35 questions)	115.6 (25.94)

Results of the confirmatory factor analysis

The factor analysis results showed a significant relationship between safety culture, lack of job stress and job satisfaction. This means that a workplace with higher safety culture can lead to less job stress and more job satisfaction in employees.

Model 1 obtained from AMOS software shows the results of confirmatory factor analysis. Also, the effective indicators on the mentioned factor analysis are given in Table 5. According to the general fit indices of the model, factor analysis had a good estimate. Given that using qualitative variables directly in the model is not allowed, first for variables such as education level using logistic regression, the probability value (p) was calculated and placed in the model and the normality of the data was investigated and confirmed by Kolmogorov-Smirnov test. Given that the fit indices of the factor analytical model include the chi-square (CMIN / df), the root mean square error of approximation (RMSEA), the comparative fit index (CFI) and Bentler-Bonett normed fit index (NFI) within the appropriate range of definition, so the developed model was approved. The appropriateness of the Holter index, which is used to investigate the appropriateness of the sample size, was also confirmed, given that there were 190 samples in the model.

Table 5. Goodness of fit indices

Tablica 5. Indeksi prilagodbe

	CMIN	Df	CMIN/df	RMSEA	CFI	NFI	Holter 0.05	Holter 0.01
value	293.47	163	2.123	0.067	0.951	0.923	145	230
Acceptable range			3-2	<0.07	>0.90	>0.90		

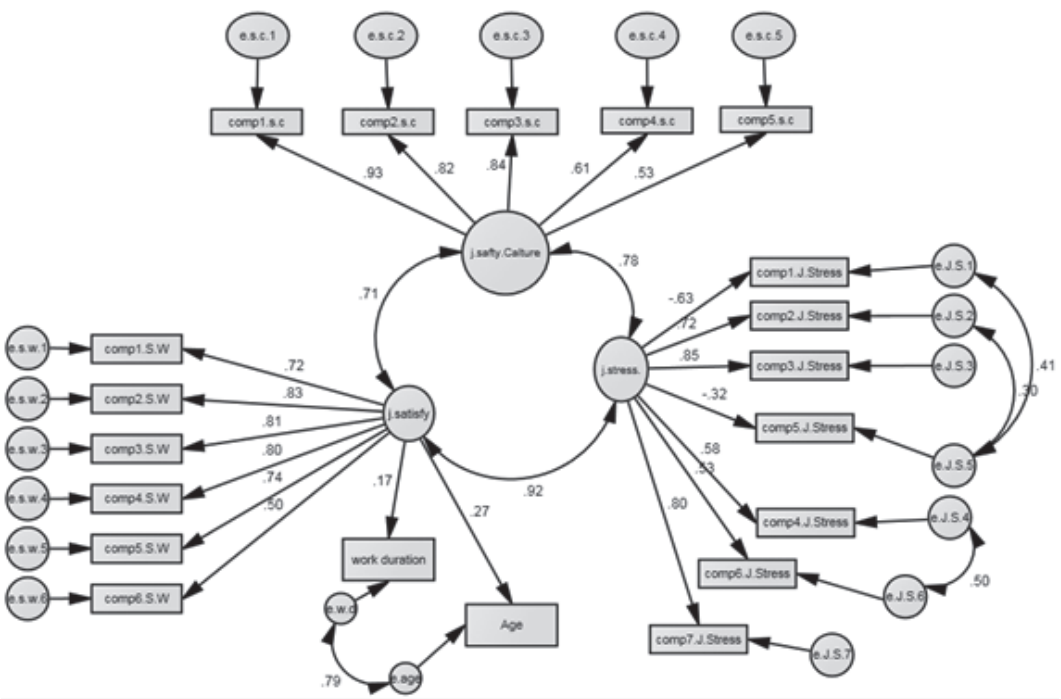

Figure 1. Confirmatory factor analysis model of safety culture, job satisfaction and lack of job stress

Slika 1. Model potvrdne faktorske analize sigurnosne kulture, zadovoljstva poslom i nedostatka stresa na poslu

Relationship between the components of safety culture and job stress and satisfaction

The results of the Pearson correlation between the components of safety culture and job stress and satisfaction are shown in Table 6. The results show a positive and significant correlation between management commitment, communication, education, safety priority, overall safety culture and job stress ($p < 0.001$). Also, a positive and significant correlation was between management commitment, communication, education, workplace, safety priority, overall safety culture and job satisfaction ($p < 0.001$).

DISCUSSION

The role of demographic variables

Among the demographic variables, a significant relationship was found between education level and safety culture ($p = 0.002$), education level and job stress ($p = 0.006$) and education level and job satisfaction ($p = 0.011$). The study results of Asivandzadeh et al. *(2020)* showed that safety training effectively affects all components of safety culture and workers' empowerment concerning occupational risk perception. Also, a significant improvement in safety culture shows the important role of training interventions and technical interventions as key factors in improving the safety status of workers in the organization.

In this study, safety culture was significantly different between groups with and without accident experience, which are consistent with the study results of Milczarek and Najmiec *(2004)*. Their study results showed that those who had experienced accidents in the past had lower safety culture scores than those who did not experience accidents *(Milczarek and Najmiec, 2004)*. The study results of Amini et al. *(2013)* also showed that the total score of safety culture in those who experienced and did not experience accidents is statistically significant, which is consistent with the study results

Table 6. Relationship between safety culture components and job stress and satisfaction

Tablica 6. Odnos između komponenti sigurnosne kulture te stresa i zadovoljstva na poslu

Variable	Mean (SD)	1	2	3	4	5	6	7
1- Management commitment	83.39 (18.58)	-	-	-	-	-	-	-
2- Information exchange	25.61 (6.33)	-	-	-	-	-	-	-
3- Education	32.85 (7.02)	-	-	-	-	-	-	-
4- Workplace Environment	15.96 (4.62)	-	-	-	-	-	-	-
5- Safety priority	20.55 (2.73)	-	-	-	-	-	-	-
6- Safety Culture	178.36 (39.28)	-	-	-	-	-	-	-
7- Job Stress	115.6 (25.94)	0.413**	0.280**	0.401*	0.029**	0.306**	0.371**	-
8- Job Satisfaction	51.73 (18.08)	0.653**	0.586**	0.591**	0.351**	0.334**	0.636**	0.445**

Note: *P<0.001, **P=0.718

Role of organizational safety culture in job stress and satisfaction of employees

The study results showed a positive and significant relationship between safety priority and culture and job stress ($p < 0.001$), consistent with the study results of Zamanian et al. *(2017)*, Asefzadeh et al. *(2011)*. Their study results showed that a significant and negative relationship was between safety culture and job stress. It was stated that the negative impact between safety culture and job stress could affect the efficiency and concentration of individuals and subsequently reduce productivity *(Mohammadfam et al., 2008, Aminian et al., 2011, Zamanian et al., 2017)*. The present study results showed a positive and significant relationship between safety culture and job satisfaction ($p < 0.001$). By focusing on improving safety performance and creating a positive safety culture, the organization can increase employees' job satisfaction and create a safe and healthy workplace. The study results of Kim et al. showed that other organizational factors such as organizational justice affect job satisfaction of employees and weakness in organizational justice reduces job satisfaction of employees, and this reduces safety and traffic accidents in drivers *(Kim and Chung, 2019)*.

A study conducted by Tengilimoglu et al. *(2014a)* also showed a significant relationship between safety culture and workers' job satisfaction and safety performance. Job satisfaction acts as a mediator between safety culture and the safe performance of employees. In his study, Tengilimoglu *(2014a)* suggested that identifying levels of safety culture and investigating the mediating role of job satisfaction for employees in different departments can show the generalizability of the study results. Other studies have also shown that workers with higher job satisfaction have a higher perception of safety behaviors and have a lower accident rate *(Gyekye and Salminen, 2006, Zare et al., 2017, Tengilimoglu et al., 2014b)*. The results of a study conducted by Ooshaksaraie et al. *(2016)* to determine the relationship between job satisfaction and culture in hospitals in Rasht showed that safety culture and job satisfaction are moderate among nurses and a direct relationship is between job satisfaction and safety culture. In a study by Yusuf et al. *(2012)*, it was shown that the safety and health status of the workplace affects the job satisfaction of employees and a positive and significant relationship was between safety and health status and job satisfaction of employees, consistent with the present study.

CONCLUSION

Based on the study results, it can be inferred that the safety and health status of the workplace and the safety culture prevailing in the organization affect job satisfaction and job stress. Also, based on the study results, safety and health education is one of the factors affecting safety culture, job satisfaction, and stress. Implementing measures to improve safety culture, sharing policies, and implementing safety programs will improve the safety and health situation at the factory level and ultimately increase job satisfaction and reduce job stress.

Acknowledgements

We thank the research deputy of University of Tehran. This article has been extracted from a master's thesis.

Funding

The author(s) received no financial support for this article's research, authorship, and/or publication.

This research was supported by University of Tehran (grant no (4030), and Code of ethics (IR.UoT.FMD.REC 1398.820494030)).

Conflict of interest

None of the authors declared a conflict of interest.

LITERATURE

Amini, M., Alimohammadi, I., Jahanihashemi, H., Fallah, D.Y.: The relationship between the prevalence of accidents and safety culture in two detergents and cleaners Companies in 1391, *Iran Occupational Health*, 2013, 10, 93-105.

Aminian, O., Farjami, A., Pouryaghoob, G., Sadeghniiat, K.: The evaluation of effect of job stress on the risk factors of the cardiovascular diseases among the drivers in Tehran in 86, *J Tehran J*, 2, 2011, 1, 26-33.

Antonsen, S.: *Safety culture: theory, method and improvement* (CRC Press), 2017.

Antonsen, S.: Safety culture assessment: A mission impossible?, *Journal of contingencies, and crisis management*, 17, 2009, 4, 242-54.

Asivandzadeh, E., Jamalizadeh, Z., Safari Variani, A., Mohebi, A., Khoshnavaz, H.: Evaluating the Impact of Training and Technical Interventions on Improving Safety Culture and Understanding the Risk of Dangerous Situations at Height among Construction Workers, *Journal of Health*, 11, 2020, 1, 109-22.

Azad Marzabadi, E., Fesharaki Gholami, M.: Reliability and validity assessment for the HSE job stress questionnaire, *International Journal of Behavioral Sciences*, 4, 2011, 4, 291-7.

Balducci, C., Romeo, L., Brondino M., Lazzarini, G., Benedetti, F., Toderi, S., Fraccaroli, F., Pasini, M.: The validity of the short UK health and safety executive stress indicator tool for the assessment of the psychosocial work environment in Italy, *European Journal of Psychological Assessment*, 33, 2015, 3, 149-157.

Boughaba, A., Chabane, H., Ouddai, R.: Safety culture assessment in petrochemical industry: a comparative study of two Algerian plants, *Safety health at work*, 5, 2014, 2, 60-65.

Buitendach, J. H., Rothmann, S.: The validation of the Minnesota Job Satisfaction Questionnaire in selected organisations in South Africa, *SA Journal of Human Resource Management*, 7, 2009, 1, 1-8.

Chen, W. T., Wang, W. C., Lu, S. T., Pan, N.-H.: The impact of safety culture on safety performance-case study of taiwan's construction industry, *International Journal of Organizational Innovation*, 2018, 11.

Choudhry, R. M, Dongping, F., Sherif, M.: The nature of safety culture: A survey of the state-of-the-art, *Safety Science*, 45, 2007, 10, 993-1012.

Clarke, S.: Contrasting perceptual, attitudinal and dispositional approaches to accident involvement in the workplace, *Safety Science*, 44, 2006, 6, 537-50.

Clegg, A.: Occupational stress in nursing: a review of the literature, *Journal of nursing management*, 9, 2001, 2, 101-106.

Clegg, A.: Occupational stress in nursing: a review of the literature, *Journal of nursing management*, 9, 2001b, 2, 101-06.

Cooper, M. D., Collins, M., Bernard, R., Schwann, S., Knox, R. J.: Criterion-related validity of the cultural web when assessing safety culture, *Safety Science*, 2019a, 111, 49-66.

Cooper, M. D., Collins, M., Bernard, R., Schwann, S., Knox, R. J.: Criterion-related validity of the cultural web when assessing safety culture, *Safety Science*, 2019b, 111, 49-66.

Cooper, M. D.: Towards a model of safety culture, *Safety Science*, 36, 2000, 2, 111-36.

Edwards, J. A., Webster, S., Van Laar, D., Easton, S.: Psychometric analysis of the UK Health and Safety Executive's Management Standards work-related stress Indicator Tool, *Work Stress*, 22, 2008, 2, 96-107.

Faragher, E. B., Cass, M., Cooper, C. L.: The relationship between job satisfaction and health: a meta-analysis, *From Stress to Wellbeing Volume*, 2013, 1, 254-271.

Fernández-Muñiz, B., Montes-Peón, J. M., Vazquez-Ordas, C. J.: Safety culture: Analysis of the causal relationships between its key dimensions, *Journal of safety research*, 38, 2007, 6, 627-41.

Gharibi, V., Mokarami, H., Taban, A., Yazdani Aval, M., Samimi, K., Salesi, M.: Effects of work-related stress on work ability index among Iranian workers, *Safety health at work*, 7, 2016, 1, 43-48.

Golubic, R., Milosevic, M., Knezevic, B., Mustajbegovic, J.: Work-related stress, education and work ability among hospital nurses, *Journal of advanced nursing*, 65, 2009, 10, 2056-66.

Gul, H., Usman, M., Liu, Y., Rehman, Z., Jebran, K.: Does the effect of power distance moderate the relation between person environment fit and job satisfaction leading to job performance? Evidence from Afghanistan and Pakistan, *Future Business Journal*, 4, 2018, 1, 68-83.

Guldenmund, F. W.: *Understanding and exploring safety culture, doctoral thesis*, Uitgeverij Boxpress, Oisterwijk, 2010.

Guldenmund, F. W. The nature of safety culture: a review of theory and research, *Safety science*, 34, 2000, 1-3, 215-57.

Gyekye, A. S.: Workers' perceptions of workplace safety and job satisfaction, *International Journal of Occupational Safety Ergonomics*, 11, 2005, 3, 291-302.

Gyekye, A. S., Salminen, S.: Making sense of industrial accidents: The role of job satisfaction, *Journal of Social Sciences*, 2006, 2, 127-34.

Hancer, M., George, R. T.: Job satisfaction of restaurant employees: An empirical investigation using the Minnesota Satisfaction Questionnaire, *Journal of Hospitality Tourism Research*, 27, 2003, 1, 85-100.

Hoboubi, N., Choobineh, A., Ghanavati, F. K., Keshavarzi, S., Hosseini, A. A.: The impact of job stress and job satisfaction on workforce productivity in an Iranian petrochemical industry, *Safety health at work*, 8, 2017, 1, 67-71.

Hopkins, A.: Studying organisational cultures and their effects on safety, *Safety Science*, 44, 2006, 10, 875-89.

Kalteh, H. O., Mortazavi, S. B., Mohammadi, E., Salesi, M.: The relationship between safety culture and safety climate and safety performance: a systematic review, *International journal of occupational safety ergonomics*, 2018, 1-31.

Khosrozadeh, M., Hosseini, M. A., Kashaninia, Z., Sedegh, G. N., Amini, M.: The correlation between organizational justice and job satisfaction among nurses, *Journal of Health Promotion Management*, 5, 2016, 2, 10-19.

Kim, S. J., Chung, E. K.: The effect of organizational justice as perceived by occupational drivers on traffic accidents: Mediating effects of job satisfaction, *Journal of Safety Research*, 2019, 68, 27-32.

Lingard, H., Yesilyurt, Z.: The effect of attitudes on the occupational safety actions of Australian construction workers: the results of a field study, *Journal of Construction Research*, 4, 2003, 1, 59-69.

Lu, C.-S., Kuo, S.-Y.: The effect of job stress on self-reported safety behaviour in container terminal operations: The moderating role of emotional intelligence, *Transportation research part F: traffic psychology behaviour*, 2016, 37, 10-26.

Mahdinia, M., Koohpaei, A., Arsang-Jang, S., Sadeghi, A., Malakuoti, J., Karimi, A.: Safety Culture Assessment and Determination of its Predictive Demographic and Occupational Variables among Industries of Qom Province, Iran, *Journal of Health System Research*, 12, 2017, 4, 427-433.

Malek, M. D. A., Fahrudin, A., Kamil, I. S. M.: Occupational stress and psychological well-being in emergency services, *Asian Social Work Policy Review*, 3, 2009, 3, 143-54.

Marcatto, F., Colautti, L., Filon, F. L., Luis, O., Di Blas, L., Cavallero, C., Ferrante, D.: Work-related stress risk factors and health outcomes in public sector employees, *Safety Science*, 2016a, 89, 274-78.

Marcatto, F., Colautti, L., Filon, F. L., Luis, O., Di Blas, L., Cavallero, C., Ferrante, D.: Work-related stress risk factors and health outcomes in public sector employees, *Safety science*, 2016b, 89, 274-78.

Milczarek, M., Najmiec, A.: The relationship between workers' safety culture and accidents, near accidents and health problems, *International Journal of Occupational Safety and Ergonomics*, 10, 2004, 1, 25-33.

Mohammadfam, I., Bahrami, A., Fatemi, F., Golmohammadi, R., Mahjub, H.: Evaluation of the relationship between job stress and unsafe acts with occupational accidents in a vehicle manufacturing plant, *Avicenna Journal of Clinical Medicine*, 15, 2008, 3, 60-66.

Moreira, F. G. P., Ramos, A. L. F., Fonseca, K. R. C.: Safety culture maturity in a civil engineering academic laboratory, *Safety Science*, 2021, 134, 105076.

Nouri, P., Alimohammadi, H. I., Arghami, S., Ghohari, M. R., Farshad, A. A.: Assessment of reliability and validity of a new safety culture questionnaire, *Iran Occupational Health*, 7, 2010, 1, 3-0.

Ooshaksaraie, M., Azadehdel, M. R., Sadowdi, F. J.: The relationship between nurses' job satisfaction and patient safety culture in the hospitals of Rasht city, *Health Safety at Work*, 6, 2016, 3, 91-102.

Platis, C., Reklitis, P., Zimeras, S.: Relation between job satisfaction and job performance in healthcare services, *Procedia-Social Behavioral Sciences*, 2015, 175, 480-87.

Seňová, A., Antošová, M.: Work stress as a worldwide problem in present time, *Procedia-Social Behavioral Sciences*, 2014, 109, 312-16.

Shirali, G., Shekari, M., Angali, K. A.: Assessing Reliability and Validity of an Instrument for Measuring Resilience Safety Culture in Sociotechnical Systems, *Safety health at work*, 9, 2018, 3, 296-307.

Strahan, C., Watson, B., Lennonb, A.: Can organisational safety climate and occupational stress predict work-related driver fatigue?, *Transportation Research Part F: Traffic Psychology Behaviour*, 11, 2008, 6, 418-26.

Tengilimoglu, D., Celik, E., Guzel, A.: The Effect of Safety Culture on Safety Performance: Intermediary Role of Job Satisfaction, *British Journal of Economics, Management & Trade*, 15, 2016, 3, 1-12.

Vosoughi, S., Chalak, M. H., Yarahmadi, R., Abolaghasemi, J., Alimohammadi, I., Kanrash, F. A., Pourtalari, M.: Identification, Selection and Prioritization of Key Performance Indicators for the Improvement of Occupational Health (Case Study: An Automotive Company), *Journal of UOEH*, 42, 2020, 1, 35-49.

Williams, E. S., Baier Manwell, L., Konrad, T. R., Linzer, M.: The relationship of organizational culture, stress, satisfaction, and burnout with physician-reported error and suboptimal patient care: results from the MEMO study, *Health care management review*, 32, 2007, 3, 203-12.

Yusuf, R. M., Eliyana, A., Novita Sari, O.: The influence of occupational safety and health on performance with job satisfaction as intervening variables (Study on the production employees in PT. Mahakarya Rotanindo, Gresik), *American Journal of Economics*, 2012, 6, 136-40.

Zamanian, Z., Zakian, S., Jamali, M., Kouhnavard, B.: Relationship between Safety Culture and Job Stress among the Personnel of Telecom Companies, *Safety Promotion Injury Prevention*, 4, 2017, 3, 161-66.

Zare, M., Aghamolaei, T., Dadipoor, S., Moradabadi, A. S., Hosaini, F. A.: Relationship between safety culture and job satisfaction in employees of Shahid Rajaee port, *Journal of Preventive Medicine*, 4, 2017, 1, 1-9.

KULTURA SIGURNOSTI RADNE SNAGE, STRES NA POSLU I ZADOVOLJSTVO POSLOM U AUTOMOBILSKOJ INDUSTRIJI

SAŽETAK: Kultura sigurnosti kao organizacijski čimbenik ima ključnu ulogu u prevenciji profesionalnih ozljeda i bolesti. Ovom deskriptivno-analitičkom studijom istražena je veza između organizacijske kulture sigurnosti s jedne strane te stresa i zadovoljstva na radnom mjestu s druge strane radi boljeg razumijevanja utjecaja koji ovaj organizacijski čimbenik ima na stres i zadovoljstvo koje zaposlenici osjećaju na radnom mjestu. Pri provedbi studije korištena su tri prokušana alata: upitnik o kulturi sigurnosti, standardni upitnik o stresu na radnom mjestu (JSQ) te standardni Minnesota upitnik o zadovoljstvu radnim mjestom. Uzorak populacije obuhvaćene studijom sastojao se od 210 nasumce odabranih radnika koji rade u 13 tvorničkih hala u tvrtkama iz područja autoindustrije. Sirovi podaci prikupljeni pri provedbi studije statistički su analizirani s pomoću računalnog programa SPSS v22, dok je potvrdna faktorska analiza provedena s pomoću računalnog programa AMOS v24. Rezultati pokazuju postojanje statistički značajne veze između treniranih i netreniranih grupa i kulture sigurnosti ($p = 0.002$), stresa na radnom mjestu i stupnja obrazovanja ($p = 0.006$) te zadovoljstva na radnom mjestu i stupnja obrazovanja ($p = 0.011$). Ocjena kulture sigurnosti značajno se razlikuje za trenirane i netrenirane grupe ($p = 0.002$). Faktorska analiza pokazuje da radna okolina s većom razinom kulture sigurnosti potencijalno vodi k nižoj razini stresa te višoj razini zadovoljstva na radnom mjestu. Rezultati pokazuju da kultura sigurnosti utječe na stres i zadovoljstvo na radnom mjestu. Također je utvrđeno da je edukacija u području sigurnosti i zdravlja jedan od čimbenika koji utječu na kulturu sigurnosti, a posljedično i na stres i zadovoljstvo na radnom mjestu. Kultura sigurnosti može rezultirati nižom razinom stresa i višom razinom zadovoljstva koje zaposlenici osjećaju na svojem radnom mjestu. Poboljšanje kulture sigurnosti poboljšat će sigurnosnu i zdravstvenu situaciju u radnim okolinama te u konačnici pojačati osjećaj zadovoljstva i smanjiti razinu stresa na radnom mjestu.

Ključne riječi: *organizacijski faktor, kultura sigurnosti, stres na poslu, zadovoljstvo poslom, automobilska industrija*

Izvorni znanstveni rad
Primljeno: 8.2.2022.
Prihvaćeno: 6.12.2022.