Can Emotional Intelligence be Used as a Tool to Control Occupational Accidents?Case Study in an Iranian Industry

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ABSTRACT

Nowadays, in order to attain safety at workplaces, we must consider two factors: ethical adolescence and emotional intelligence. Emotional intelligence helps people to learn about regulations, experiences and revelation of emotions. This study aimed to survey the relationship between emotional intelligence (EI) with occupational accident in a publication industry, in 2014. In a cross-sectional study, all operational employees (n=98) working at a publication industry were included. Demographics, Bradberry-Greaves questionnaires were tools for gathering data. Occupational accidents were self-reported and then checked against documents in the organization. Statistical analysis such as T-test, ANOVA and Pearson correlation was used for data evaluation by SPSS V20. All workers were men and range of age was reported to be 24-61 with Mean 122.13±15.68. Also, 21.2% of personnel have experienced occupational accidents (0-5 cases). Also, Mean EI test score was calculated to be 122.13±15.68. There was no significant relationship between emotional intelligence scores among workers with and without accidents (p>0.05).Conditions in the view of emotional intelligence were suitable, but continuous improvement for total consideration and circumstances would be vital. Training program preparation free from workers of different educational levels is recommended. The company must provide a program that can afford workers the opportunity to review errors and gain cognitive systems in order to work with the improved conditions.
Key words: Emotional Intelligence; Occupational Accident; Safety; Publication; Iran

INTRODUCTION

Workers in developing countries are 60 percent of the world's workers, and 80% of them are working in inherently hazardous places [1]. According to the International Labor Organization (ILO) report, 270 million employees experience injuries in the workplaces and two million people lose their lives annually [2]. Organizations pay around four percent of GDP per year in direct and indirect costs of work-related accidents and injuries [3-4]. Accidents and work-related injuries cause loss of several millions of working days each year [5]. According to statistics, the incidence of work-related accidents in the manufacturing industry has the largest share [6-7]. In Great Britain and between the years 2013-2014, 7.4 million working days were lost due to work-related injuries [8]. In addition, that country lost 14.2 billion pounds of economic costs due to occupational accidents in 2012 [8]. In developed and developing countries, occupational accidents and ways to prevent them are considered very important. In a study conducted in Iran and according to the Social Security Organization, the number of people injured in 2001 has been reported as 14,114 cases, of which

468 have been fatal [9]. The statistics after a decade and in 2011 have reached a total of 20,404 in that decade out of which 220,400 people faced accidents [10]. Generally, in a more complex and competitive environment for organizations, the rapid changes and more complicated organizational management depicted the necessity of more attention to human talents. Furthermore, behavioral psychology states that behaviors are dependent on the environment where they are located. On the other hand, employees' unsafe behaviors do not merely depend on the physical environment, but also to individual circumstances such as experience and social environments like relationships with other employees [11]. To understand the significance of behavior and characteristics of individual employees in the workplace, e.g. feelings and emotions, knowing their position in the chain of accidents can help a lot. One of the most vivid theories of accident chain that was presented by Heinrich in 1959 is known as the domino theory [12]. This theory explains the accident process in five factors including the social environment, personal faults, unsafe behavior or action and/or physical or mechanical hazards,

accident and damage (injury to person or loss to the organization). In the meantime, personal fault means genetic or acquired errors such as recklessness, anger, violent temper and irritating behaviors. These are the reasons for committing unsafe acts or the provision of situations that create mechanical or physical and emotional hazards are indeed included. Results of previous studies have shown that by controlling employees' behaviors in the workplace and moving them towards the conduct of safe behavioral attitudes; it is possible to prevent the occurrence of accidents and injuries [11-12]. On the other hand, emotions also play a vital role in human life. Anger, disgust, fear, anxiety and happiness are just some of the feelings and emotions that people may understand in certain situations. Emotions provide people to make quick physical responses and this helps them to attain beneficial consistency by preparing an appropriate cognitive approach, and complex social behaviors are shown in a flexible way.

Though emotions may be involved in adaptive behavior, but optimized emotional response is achieved when the people know how to regulate, experience, and express their emotions and in addition, learn how and when to apply them in order to form the required emotion, something that differs among various individuals [13-14]. This ability is organized in the framework of emotional intelligence (EI) [15]. Excitement and attention are closely related to each other, emotional states have an impact on the content of awareness and performance of tasks that require stimulus selection or deep focus [16]. It is clear that the absence or lack of concentration and attention is of human errors which are reasons that consequently lead to the occurrence of accidents. EI is a term that has attracted a lot of attention and contains a massive wave of management, psychology, and health sciences. In fact, the EI is as a result of two main skills including the individual and social abilities. The individual ability focuses on the human as an individual and is divided into self-awareness and self-management parts. Social abilities focused more on how to treat others and social awareness and relationship management is its two realms [17-19]. EI determines how to manage our own behaviors, how to cope with problems, and how to make decisions that lead to positive results [19]. This is a factor that industrial organizations need in order to make the workplace much safer.

With regards to the relationship between EI and health behaviors, Kleidon quotes Brackett and Mayer, and Trindad and Johnson found that those with higher EI use tobacco (r=-0.16) and alcohol (r=-0.19) lower [20]. EI is a crucial factor in real life outcomes such as educational success, success in work and interpersonal relationships and generally in

health function [21]. Also, EI can be considered as the main factor to predict performance in the workplace and as the strongest force for leadership and success [22]. It has been demonstrated that only 20 percent of people's success depends on the intelligence quotient (IQ) and EI has the main role in 80% [23]. EI helps people to better understand the interpersonal techniques, understanding and managing the effects of emotion on thinking and behavior, development of the ability to recognize social dynamics in the workplace and helps them to understand how to handle and improve relations [24]. In the past, managers tried to achieve a safer workplace through changes in the environmental conditions and equipment, for example by engineering actions. But today, experts have reached the point that these changes do not have high speed to deliver transcendental aims of the workplace without accidents. On this basis, the need to pay attention to two other key factors has been raised, moral maturity and EI [25]. A survey in Nigeria showed that 80 percent of drivers, who have had a crash, had low EI or emotional control was difficult for them [26]. In organizations where employees have attended emotional capability trainings, time wasted for accidents decreased from 1 to 50% and productivity goals can be increased by increasing production [27]. With this background, the leading study aimed to investigate the relationship between EI and occupational accidents in a printing and publishing industry in the city of Qom and was executed in 2014.

MATERIALS AND METHODS

This cross-sectional and descriptive-analytical study has been conducted among all operational staff (98 people) of a printing and publishing company. A questionnaire was used to collect demographic data on age, gender, relevant work experience, number of training courses, number of occupational accidents and the educational levels, the questionnaire was developed by researchers. EI was also assessed using a questionnaire provided by Bradberry and Greaves [28], its standardization has been examined by Ganjiand et al. in Iran [29]. It should be noted that self-reported accidents were checked with registered documents in company. EI Questionnaire included 28 items and each of the respondents could be scored 28-168. It consisted of four sub-scales of self-awareness, self-management, social awareness and relationship management. Scoring was based on a Likert scale of 1 to 6 (from never to always). Total score of the participants was calculated by summation of each question's score. The reliability of this questionnaire has been reported by Cronbach's alpha coefficient 0.88 [29] and 0.83 [30]. After

determining EI and the number of accidents for each of the participants, relationship between them was analyzed using Pearson correlation coefficient through SPSS V20. In addition, the t-test, and ANOVA was used for the evaluation of the differences between demographic groups with regards to EI and accidents.

RESULTS AND DISCUSSION

Demographic information

Ninety eight questionnaires were distributed and completed with the response rate of 81%. After analyzing the process and survey of the questionnaires, demographic data are summarized in Table 1. It should be noted that all participants were males and most of them had educational levels below diploma (67.5%) and diploma with 26.2% as well as 88.5% of them were married. The personnel age range was from 24-61 years with a mean of 41.79 years (± 6.77). Also mean and standard deviation of the work experience was obtained to be 16.52 and 5.67 years respectively. Based on Table 1, 21.2% of employees have reported occupational accidents with average 0.35(± 0.813) in the range of 0-5.

Table 1: Description of qualitative demographic factors (n=80)

Factor		Frequency	%
Marriage status	Married	79	98.8
	Single	1	1.2
Education	Lower of Diploma	54	67.5
	Diploma	21	26.25
	Associate's degree	1	1.25
	Bachelor or higher	4	5
Working system	Shift working	42	52.5
	Day working	38	47.5
Occupational accident (OA)	No	63	78.8
	Yes	17	21.2

EI

Cronbach's alpha (0.84) was used to determine the reliability of EI. The alpha value for subs-cales has been calculated to be equal to 0.59 for self-awareness, 0.51 for social awareness, 0.53 for self-management and 0.73 for relationship management. The mean and standard deviation of EI in the plant was 122.13$\pm$15.68. Based on the average scores of the questionnaire (μ=98), it is clear that EI in the studied company was above average. Among the four components of EI, relationship management with the

average of 37.10 had the highest average scores and social awareness of 21.60 had the lowest average. The details of the scores of EI have been shown in Table 2.

Table 2: Description of Emotional Intelligence and its factors scores (n=80)

Factor	Mean	SD	Max.	Min.
Self-awareness (SA)	27.09	4.195	35	12
Self-management (SM)	36.11	5.722	49	17
Social awareness (SoA)	21.60	3.85	29	10
Relationship management (RM)	37.10	5.568	47	16
Emotional Intelligence (EI)	122.13	15.68	150	65

The relationship between variables

The difference between each of the four sub-scales and the total score of EI, with the number of occupational accidents among single and married employees, and shift workers, were analyzed using t-test. The results showed that differences in marital status group are not statistically significant (p>0.05), also with the difference between two groups of shift and day-working with the number of accidents, and the relationship management was not significant (p>0.05) but difference in other variables (self-awareness, social awareness, self-management and EI total score) was significant (p<0.05). Using one-way analysis of variance between individuals with different educational levels did not indicate a significant difference statistically (p>0.05). The differences between each of the four sub-scales and the total score of EI among two groups (with accident and without accident) were analyzed using t-test and they were not significant (p>0.05). Although there were differences in the studied factors among the two groups, (with accident and without accident) there was no statistical significance (p>0.05), but based on the comparison of the mean scores of the two groups of subjects, it can be concluded that people who had accident in social awareness had better scores.

The relationship between EI and its sub-titles, with age, work experience, the number of occupational accidents and number of training courses using Pearson correlation test were analyzed. Based on the results, it was found that relationship of the number of occupational accidents with before mentioned variables were not statistically significant. However, relationship between EI and its sub-titles with acceptable coefficient between 0.75-0.85 was statistically significant (p <0.01). Social awareness had the highest and self-awareness, lowest correlation with total EI. Table 3 shows the correlation coefficients and their significant levels.

Table 3. Pearson correlation coefficients and significance level of different variables

Studied Factors	Statistical evidences	Age	Work history	OA No.	Training course No.	SA	SM	SoA	RM	EI
Age	Cor	1								
	Sig.									
Work history	Cor	**0.686	1							
	Sig.	0.001								
OA No.	Cor	-0.019	0.130	1						
	Sig.	0.87	0.249							
Training course numbers	Cor	*0.252	*0.228	-0.144	1					
	Sig.	0.024	0.042	0.201						
SA	Cor	-0.076	-0.189	0.024	0.027	1				
	Sig.	0.500	0.093	0.830	0.812					
SM	Cor	0.018	-0.071	0.032	0.200	**0.479	1			
	Sig.	0.873	0.533	0.777	0.077	0.001				
SoA	Cor	-0.098	-0.127	-0.096	0.035	**0.552	**0.585	1		
	Sig.	0.389	0.262	0.396	0.759	0.001	0.001			
RM	Cor	0.040	-0.122	0.171	-0.096	**0.474	**0.473	**0.654	1	
	Sig.	0.726	0.279	0.129	0.395	0.001	0.001	0.001		
EI	Cor	-0.033	-0.163	0.050	0.035	**0.749	**0.806	**0.846	**0.819	1
	Sig.	0.774	0.153	0.665	0.760	0.001	0.001	0.001	0.001	

* $P<0.05$, ** $P<0.01$

The results of the data analysis showed EI was in acceptable conditions. In the view points of the work-related accident prevalence, approximately one-fifth of workers had experienced a minor occupational accident. Based on this fact, the studied organizational status was generally appropriate. However, the best policy for productive organizations should be to achieve a safer working environment. In line with our research, a study conducted in Nigeria [26] indicated that the level of education was not associated with EI. Some studies have also rejected this relation [30], although some studies have confirmed [31]. Similar to our findings, Saeid et al [30] and Yousefi et al [31] in their studies have concluded that marital status is not a significant factor associated with EI.

In this research, all participants were men hence an evaluation of EI differences between the two groups (men and women) was not available, however some previous studies have dismissed this difference [31-33] and some have confirmed [34-35]. Among shift-workers and day-workers, only relationship management score was not significant. For all factors, shift workers were better. Based on this fact that the risk of error [36], as well occupational accident [37] among shift workers is more than day workers, this situation is suitable in order to reduce errors. Our findings revealed that among the four dimensions of EI, there was a significant relationship that is similar to the results of previous studies [38-39].

About the level of each of the components of EI, according to research, Riahi Farsani and colleagues [40], self-management and relationship management were two factors with higher scores and self-awareness and social consciousness were two factors with lower average. Workers with non-accident history have received higher scores in the factors such as social awareness. It was revealed that this group of workers can better understand others' emotions and to recognize the situation; as well as perceive the feelings of others and, in fact, have empathy. However in this study, a significant relationship between the two groups (with and without accidents in their work history) in terms of EI scores and its components, which can be caused by the low proportion of people with occupational accidents experience in the study, but with given that previous studies indicated that emotional stresses can have effect on large traffic accidents [41] and on the other hand, by introducing anxiety and cognitive defects as causes of occupational accidents as well as significant relation between work-related accidents and cognitive defects [5], occupational accident with depression [42-43], with stress [44-45], and anxiety [46] should give special attention to EI as a critical factor. As other documents on this matter, a study had been designed by Kleidon among 420 Australian Defense Force personnel (ADF) who participated in the study that completed NAMSS questionnaires (check the maintenance and safety of the aviation/marine industry). In this study, six factors: public information, safety climate, unsafe acts

(errors), health, EI and fatigue were evaluated. Finally, the results have shown a negative relationship between EI and poor health conditions (-0.17) as well as a positive correlation between poor health conditions and unsafe acts (0.60) [20].

CONCLUSION

Although the organizational status of the view points of EI scores was acceptable, attention must be paid to continuous improvement in all aspects. EI involves acquired skills. However, it would be possible to learn its different aspects with practice. It should be noted that the training should be done regardless of workers' educational level. Also, application of training courses for the development of components of EI leads to the reduction of anxiety and stress and that can help prevent accidents and injuries in the workplaces. The company should adopt a plan that can afford people the opportunity to review their mistakes and errors as well as boost their cognitive systems, to help improve future conditions. Among cognitive, emotional and safety culture, there is an interaction that helps error analysis and learning from mistakes in order to avoid them in the future.

ETHICAL ISSUES

Ethical issues such as plagiarism have been observed by the authors.

CONFLICT OF INTERESTS

Authors declare that there is not any competing interest.

AUTHORS' CONTRIBUTIONS

All authors contributed equally.

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