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The Relationship between Safety Locus of Control and Occupational Trauma: a Cross-Sectional Study

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ABSTRACT

Opinions about the occupational trauma causes are significantly different, which have a great impact on the nature of interventions and may improve health and safety (H&S) performance. Locus of control can be one of the most important determinants of the H&S performance. Because of the importance of this variable in relation to the prevention of occupational trauma in work environments, this study was aimed to investigate the relationship between safety locus of control and occupational trauma. This cross-sectional study was conducted on 346 employees of a cosmetic industry. The instruments included a demographic questionnaire, safety locus of control questionnaire, and self-reported occupational trauma questionnaire. Data were analyzed using descriptive and analytical statistical tests in IBM SPSS software version 22.0. Of the total number of participants in the study, 22.5% (76 people) were reported that they had experienced an occupational trauma in the last year and 77.5% (262) did not have occupational trauma. Four subjects did not respond to the occupational trauma-related questions. The mean score of safety locus of control in the study group was 38.87±5.8 and was higher than the mean value of the questionnaire (36.0). The results showed that the safety locus of control had a significant relationship with occupational trauma ($p<0.01$). These findings confirmed the results of previous studies, which had been carried out mostly in non-industrial areas. The results have indicated that the place of safety locus of control had a significant effect on occupational trauma in industrial areas, so it can be considered as a predictor of occupational trauma occurrence.

KEYWORDS: *Locus of control, Occupational trauma, Error, Safety performance*

INTRODUCTION

Occupational trauma is considered one of the most important injuries in developing countries [1]. One of the most important determinants of safety behavior is the locus of control [2-3]. The locus of control is the amount of belief in the subject that the conditions that are created for him/her are controlled by him/her [4-5].

Safety locus of control (SLOC) is also the degree of control to which people think of occupational trauma and injuries [6]. In addition, discussion about the safety issues is important and some studies have investigated the relationship between incidence and occupational trauma status [7-11].

Based on the results of previous studies in some areas of work (military and passenger pilots, health department, drivers, etc.) and regarding to the relationship between SLOC with occupational trauma and unsafe behaviors, it is assumed that there can be a similar relationship between safety locus of control and occupational trauma in industrial workplaces [9-12-13].

Therefore, because of the importance of this variable in the improvement of safety performance and prevention of occupational trauma at industries, and given that there was less research in this field in industries, this study was aimed to determine the status of SLOC and investigate the relationship between this variable and occupational trauma occurrence.

MATERIALS AND METHODS

This cross-sectional, descriptive and analytical study was conducted on employees of the cosmetic industry. The study population consisted of 382 subjects that 346 subjects of them participated in the study. The instruments included demographics, SLOC and self-reported occupational trauma questionnaires. The researchers used the SLOC questionnaire published by Amidi Mazaheri et al. [6]. This questionnaire had 12 questions with a five-point Likert scale. The minimum and maximum possible scores of SLOC were equal to 12 and 60, respectively. In this questionnaire, the score of less than 36 was considered as an external locus of control and the score equal and more than 36 as an internal locus of control. The questionnaire had three dimensions, including internal control (4 questions), environmental control and equipment (4 questions), and luck and fate (4 questions). In this questionnaire, questions 1 to 4 were scored directly and questions 5 to 12 inversely.

The occurrence of occupational trauma in the individual was investigated through a self-reported occupational trauma questionnaire. Therefore, in a part of the questionnaire, respondents were asked to report the occupational trauma in the last year. However, the self-report method of occupational trauma may result in bias, but it has been argued that this method is a reliable technique [14-16]. After ensuring the consent of the individuals for voluntarily entering the study, the required explanations and the purpose of the study were presented to them and a questionnaire was given to them.

Then, the participants were asked to complete the questionnaire fon 15 minutes and respond to all questions. In some cases, the ambiguity was resolved and questions were answered. Finally, the completed questionnaire was collected. Data were analyzed using IBM SPSS software version 22.0. Descriptive statistics such as frequency, mean, and standard deviation were used to analyze demographic and occupational data. The normality of data was tested using the Kolmogorov-Smirnov test. In the analytical section, an independent t-test with a confidence level of 95% was used to investigate the difference of the mean of SLOC position score between subjects with and without occupational trauma. Multiple linear regressions were used to evaluate the relationship between individual and occupational variables with the occurrence of occupational trauma. Logistic regression was also applied to assess the relationship between SLOC and occupational trauma, taking into account the effect of other variables.

RESULTS

The results showed that the values of the mean and standard deviation of SLOC in the study group were equal to 38.78 and 5.8, respectively. The descriptive results showed that the mean values of age and work experience of participants were 30.48±5.05 and 6.9±3.9 years, respectively. Based on the results, the mean daily work time was 10.07±2.33 hours. In

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addition, the results showed that 75.4% of the participants were male and 24.6% were women. Also, 30.6% were single and 69.4% were married and 40.7% had academic level. 65.7% of participants in the study were workers, 33.7% were employees, and only 9.9% stated that they were engaged in a second job. It was also found that the majority of people were working in the morning shift (91.7%). 22.5% (76 people) reported that they had experienced an occupational trauma in the last year and 77.5% (262) did not have occupational trauma.

The results of the investigation of the relationship between SLOC and occupational trauma were presented in Table 2, 3, and 4. These results indicated that the SLOC had a significant correlation with the occurrence of occupational trauma (P-value <0.01). Additionally, Hosmer and Lemeshow test showed that regression analysis was appropriate to investigate this relationship (P-value = 0. 48) and the explanation of the data is acceptable by the model.

Table 1. Mean and standard deviation of safety locus of control and its dimensions

Variable	Mean	S.D	Mid	Max	Min
Internal control	14.26	2.89	15	20	7
Environmental control and equipment	10.16	2.47	10	18	4
Luck and fate	14.48	2.79	15	20	5
Safety locus of control	38.78	5.08	39	52	25

Table 2. Comparison of the safety locus of control score in people with and without occupational trauma

Variable	People who have occupational trauma	People who did not have occupational trauma	P-value
	SD±Mean	SD±Mean	
Internal control	12.99±3.05	14.55±2.73	0.00
Environmental control and equipment	9.47±2.59	10.45±2.36	0.03
Luck and fate	14.02±3.10	14.71±2.64	0.17
Safety locus of control	36.41±4.67	39.65±5.01	0.00

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Table 3. Relationship between safety locus of control, individual, and occupational variables

Independent Variable	B	Std. Error	β	P-value	95.0% Confidence Interval for B	
					Lower Bound	Upper Bound
Smoking	-3.871	1.598	-0.194	0.017	-7.030	-0.713
Chronic disease	-3.478	1.411	-0.197	0.015	-6.268	-0.688
Having a second job	-2.952	1.293	-0.183	0.024	-5.507	-0.396

Table 4. Relationship of the safety locus of control and the occurrence of occupational trauma

Independent Variable	B	S.E.	Wald	df	Sig.	Exp (B)	95% C.I. for EXP(B)	
							Lower	Upper
Type of Job	1.44	064	5.00	1	0.02	4.23	1.19	14.99
Working hours per day	0.19	0.09	3.88	1	0.04	1.21	1.00	1.46
Safety locus of control	-0.15	0.05	8.84	1	0.00	0.86	0.77	0.95

DISCUSSION

Findings indicated that the mean score of SLOC in the studied population was higher than the mean score of the questionnaire (μ=36). Therefore, the SLOC in the studied population was internal, which indicates that the locus of control is appropriate in the study group. The results revealed that the mean values of the internal control and chance and fate dimensions (14.26 and 14.48, respectively) were higher than mean scores in the questionnaire (μ=12) and determined the relative suitability of SLOC in these two dimensions [6]. Therefore, the view of employees in these two dimensions is that the causes of occupational trauma are further affected by their performance. In contrast to these results, the average score of SLOC in the area of environmental control and equipment (10.16) is lower than the mean value in the questionnaire (μ=12), which shows that more people have considered environment externalities and equipment as the causes of occupational trauma [6].

However, the findings of this study are consistent with other studies [6-17-18], but SLOC will be different in each organization/industry based on safety and health management system.

The comparison of the mean score of SLOC and its dimensions in the two groups (with and without occupational trauma) indicated that the mean scores of the internal control and environmental and equipment control and the total score of the SLOC were significantly lower (external) in individuals without occupational trauma. However, the difference in mean

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scores of chance and fate between the two groups was not statistically significant. Furthermore,the results showed that chronic illness, smoking, and having the second job had a significant correlation with the locus of control. The regression coefficients revealed that the SLOC had a lower score in smokers, and smokers had a more external locus of control status compared to non-smokers. The findings were consistent with the study of Joseph and Ganesh [5].

Logistic regression analysis indicated that type of job, daily work hours, and SLOC were the predictor variables of occupational trauma. For example, with increasing the hourly working time, the chance of an occupational trauma increased by 1.21 times. On the other hand, the chance of occurrence of the occupational trauma in the workplace decreased with the increase of the SLOC.

The findings are consistent with similar studies [7-9-14-19-20]. Hunter concluded that there is a significant relationship between SLOC and the occurrence of occupational injuries [7-19]. Jones also concluded that people with higher external SLOC had significantly more injury than those with internal SLOC [10]. Wuebker revealed that people with more vulnerabilities had higher external status and less vulnerable people had more internal status [20]. Additionally, Xuqun Youa concluded that SLOC directly affects risk perception and safety behavior [14].

CONCLUSION

Consequently, the findings of the present study confirmed the results of previous studies, which have been carried out mostly in non-industrial areas and have shown the place of SLOC has a significant effect on occupational trauma. People who have an external control are less likely to work to improve their safety function and follow the instructions, and they are more likely to be injured. Therefore, the place of SLOC is a personality trait that affects the occurrence of occupational trauma and it should be considered in the organization's health and safety programs. These programs can include well-documented continuing education programs to change the staff's perspective and training courses on revising events and explaining their causes for staff. In this way, employees' viewpoints on the causes of occupational trauma will change over time.

CONFLICT OF INTEREST

There is no conflict of interest for any of the authors.

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