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Effectiveness study of Health, Safety and Environmental training in Occupational injuries of municipality Workers (Case study: district 4 of Tehran)

Roodabeh Rostampour[1], Nooshin Sadjadi[1]*, Roya Nezakati[1]

[1]*Environmental Science and Technology Department, Marine Science and Technology Faculty, North Tehran Branch, Islamic Azad University, Tehran, Iran*

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nooshinsadjadi@yahoo.com

Abstract

The aim of this study was to evaluate the effectiveness of training courses on environmental hygiene to reduce occupational injuries in municipal workers. This study is descriptive based on its purpose and according to the method of studyis in category of quasi-experimental and intervention studies. The study population included all workers of Tehran 4th District in the area of municipal services, according to declaration of employment office the number of employees is 800 people. Of these, 260 were chosen. Data collection was done using two methods of library and case study. Data was collected through the questionnaire consists of three component including intrapersonal damage, interpersonal damage and transpersonal damage. Then analyze the data using statistical techniques were performed using SPSS version 21. Statistical methods used in this research are included descriptive and inferential statistics. In the inference statistical analysis in order to evaluate and test hypothesis of study, variables were first analyzed using Kolmogorov-Smirnov test of normality. Then by hypothesis was validated using independent t-test, ANOVA multivariate test. The results show that training courses of safety, health and environment significantly reducing occupational injuries which affected workers. The effectiveness was observed in all three areas of damage within the individual, interpersonal and Transpersonal ($p<0.05$). The results obtained from this study suggested that training courses in various fields related to health and safety regularly and courses for workers in various fields, especially municipal workers exposed to more harmful damages by the type of their workwill be held.

1. Introduction

Health in the world of science and technology has become increasingly important in a world that is already moving towards more industrialization. Today, the motto of a healthy human being is at the forefront of many organizations. Occupational injuries are also a major public health problem, even in developed countries, which have seen significant advances in occupational health, safety, regulations and preventive measures in the working environment in recent years. The necessity of designing and performing training in the workplace in organizations is a natural thing and everyone agrees on it. However, in the design and implementation of training, what is important is the assessment of the effectiveness of these types of training that can be derived from the results of the training Supplemented and directional design. Usually qualitative assessment and, in terms of the effectiveness of training, is a difficult task that, if this process can be implemented, the training will lead to the creation of the required skills and the absence of occupational injury.

The importance of the safety and health management issue, which was reported in the British Occupational Safety and Health Executive Board's report, claims that accidents and accidents cost an average of 37% of the annual transportation costs of transport companies, 8.5% The price of each tender for construction companies and 5% of the current costs of hospitals, which necessitates the design of safety and health management systems in organizations [1]. With the effective design of an education management system for safety, health and the environment, many of these costs can be reduced [2]. Safety education is a process by which employees acquire knowledge [3]. Providing adequate training for all employees to ensure their safety is important [4] and should

enable them to anticipate and avoid work-related hazards [5]. When training is properly managed, training for staff provides the necessary information to help avoid accidents [6].
In 1998, the National Institute of Occupational Safety and Health (NSAI), with the aim of examining the effectiveness of safety education courses, showed that education is effective in helping to reduce occupational injuries and diseases [7]. Recent research also suggests that safety education is one of the most effective means of preventing diseases and occupational accidents [8,9,10]
Gidden [11] claim that training ways to increase the focus of internal control can translate the negative effects of road hostility into drivers and, in addition, enhance their sense of responsibility in driving behaviors. With regard to research on the documentary styles and their impact on human behavior, the importance of the feasibility of the subject of the document becomes clearer. Safety plans Because it can be deeply affected by courses, documents should be placed on the front of their content [12]. Perhaps the most important point in the relationship between the incident and control center is that people with an external control center are less concerned with controlling the environment and developing their abilities to overcome environmental barriers. Individuals with an internal control center feel that incidents can be prevented and learned cognitively less well than those with external documentation. How can a worker who sees the cause as a tool malfunction or a driver who contributes a lot to the role of the road in the occurrence of incidents can use mental creativity to control accidents? Training gives us the best result in order to guarantee accountability and cost. Therefore, the purpose of this study is to investigate the effectiveness of health, safety and environmental education on occupational injuries of workers in district 4 of Tehran, in particular, workers of the municipal services district 4 of Tehran municipality will be studied. Did the given training have any effect on the reduction of the occupational injuries of these workers?

Materials And Methods

Statistical Society

A statistical society is a group of individuals or objects that are common in the properties or properties that are related to the purpose and the subject [13]. In other words, society refers to a set of objects, individuals, places, events, and events that are common in one or more attributes [14]. In this research, the statistical community includes all workers in the field, the municipal services of the 4th municipality district of Tehran, according to the statistics provided by the unit of staff, are 800 people.
In this research, the statistical population includes all the employees of the municipal services district 4 of Tehran municipality, which according to the statistics provided by the unit of staff, there are 800 people.

Statistical sample and sampling method

The choice of sample size in designing a research, because it represents the realities of the society and follows it is a key issue, the sample size as an agent affects the average error, and thus the correctness of it causes the sample to rise. In addition, accuracy and accuracy of sampling reduces the cost of observation and cost savings. The research sample is calculated using the Cochran formula [16]. As follows :

$$n = \frac{\frac{z^2 \times p.q}{d^2}}{1 + \frac{1}{N} \times (\frac{z^2 \times p.q}{d^2} - 1)} \Rightarrow \qquad \text{Eq(1)}$$

$$n = \frac{\frac{(1.96)^2 \times (0.5 \times (1-0.5)}{(0.05)^2}}{1 + \frac{1}{800} \times (\frac{(1.96)^2 \times (0.5 \times (1-0.5)}{(0.05)^2})} = 259.70 \cong 260 \qquad \text{Eq(2)}$$

The description of each of the symbols used in the Cochran formula is as follows:
N: The population of the statistical society in this study is all the workers of the municipal services district 4 of the municipality of Tehran, whose number is about 800 people.
n: The sample is an index calculated according to the Cochran formula 260.
Z2: Estimate of confidence with 95% confidence, this value is equal to 1.96.
d: The maximum acceptable error is assumed to be 0.05 here.
P: is the success rate among the sample individuals, which is 50%.
Q: The rate of failure among sample individuals is considered to be 50% (1-p = q).

Considering the number of samples, with the probability of not completing or delivering a number of questionnaires by the staff, 265 questionnaires, among pre and post training workers (about 130 questionnaires in each group, the group of trained workers and Untrained Workers Group), which was returned after a survey carried out of 260 questionnaires.

Methods of data collection:

Since the present research is based on a descriptive-survey method, its data and data, in terms of objectives, applied research nature, subject as well as the means of execution, are in the form of library studies including the study of various Persian and English texts (books, articles Etc.) have been collected in relation to occupational health and safety literature and occupational injuries, that is to say, part of the required data has been collected using historical data that is fully recognized in European countries[15]. For other information through field studies, a questionnaire has been used. In fact, the researcher, by designing a questionnaire and distributing it among the statistical sample, collects the data needed for the research in the municipality of Tehran's district 4, and finally, in order to Processing information collected from SPSS software is used.

How to conduct research

In this study, in order to study the effectiveness of health, safety and environmental education courses on occupational injuries of workers, workers were divided into two trained and untrained groups. Trained workers are generally workers with a background who are trained regularly and periodically (several times each year) from their recruitment. The content of educational sessions is often:

Table 1 - Training courses for urban service workers

Educational headings	Educational field
- The importance of health - Personal hygiene - Body Health - Infectious diseases - noncommunicable diseases - vaccination - Sprayer workers diet Family Planning-	general Hygiene
- Prevention of mental illness - Features of people who are psychologically healthy - Signs for psychological weakness -Causes of increased prevalence of mental illnesses	Mental Health
- Principles of nutrition and health food -Health Food	Training the basics of nutrition and food safety
- Air Hygiene - Health hazards of waste - Water Health - Air pollution sources - Air pollutants and their effects - Air pollution sources - Air pollutants and their effects - Water resources - a healthy water feature -Waterborne diseases	Environmental Health
- physical factors - Factors - Biological agents - Psychological factors - Importance of job examinations - Accidents caused by work - Work-related diseases -Application to employ workers proportional to physical activity	Professional health

Research tool:
The tool used in this study was "questionnaire". The questionnaire is one of the common tools of research and is a direct method for obtaining research data. The questionnaire is a set of questions (phrases or items) that the respondent provides with their consideration of the answer. This answer is the data needed by the researcher. The questions of the questionnaire can be considered as a stimulus-response. Through the questionnaire, one can assess the knowledge, interests, attitudes and beliefs of a person in relation to a specific topic, learn from previous experiences and become aware of what is currently being done. The present questionnaire was used as a measurement tool, including: 1) general or demographic questions; 2) a questionnaire for assessing occupational injuries.

Validity and reliability of research tools:
Validity:
Validity of the word means the right and proper meaning and validity means correct. The purpose of the validity is that the measurement tool can measure the characteristic and feature. The significance of the validity is that inappropriate and inadequate measurements can make any scientific research worthless[16]. There are several methods for determining the validity of the questionnaire, one of which is content validity.
Content validity is a kind of validity used to examine the constituent parts of a measurement tool. The content validity of a measurement tool depends on its constitutive questions. If the questions of the questionnaire reveal the special features and skills that the researcher intends to measure, the test has content validity. In order to ensure content validity, it must be done when making the tool so that the question of the instrument of measurement is representative of the selected content segments. Therefore, content validity is a structural feature of the measurement tool, which tries to formulate the test at the same time. The content validity of a test is usually determined by people specializing in the subject matter. The content validity of this questionnaire has been verified by the supervisor and mashaver and several informed people.

Reliability:
A test has reliability when the scores and actual scores are highly correlated. In this sense, if the scores observed and the actual scores of each of the subjects are available in the test, the correlation squared between these scores is called the test reliability coefficient [16]. In this research, collected data using a questionnaire to measure the collected data, SPSS software was used to analyze the data. At first, 30 of the subjects were tested and then the reliability The questionnaire or its reliability was calculated using Cronbach's alpha method.
The percentages obtained are closer to 100 percent, indicating the greater reliability of the questionnaire. It should be noted that the alpha coefficient of less than 60% is generally considered to be weak, the range of 70% is acceptable and more than 80% good. However, although the trust coefficient is closer to one, it is better to [17].In this research, the same as mentioned above, data were collected from the original sample by SPSS software. Thus, by obtaining an alpha of 0.91 for the component of personal injury, 0.85 for interpersonal injuries and 0.89 for the complementary component of injuries, and 0.95 for the total questionnaire reliability questionnaire was approved.

data analysis method:
To analyze the collected data using questionnaires, statistical methods were used in the form of descriptive statistics and inferential statistics.
Descriptive Statistics:
Descriptive statistics are referred to as statistical methods that assist the researcher in categorizing, summarizing, describing and interpreting, and communicating through aggregated information. In general, descriptive statistics provides an overview of the observed data with the help of standard figures and charts. In the descriptive section, the descriptive statistics of the center (middle, middle, faces), scattering criteria (standard deviation, range of changes, Minimum, maximum), tables and charts, ratios, and percentages.
Inferential statistics:
In the inferential statistics, the researcher always deals with the flow of sampling and the selection of a small sample group of a larger group known as the statistical society or population, and the researcher deals with the data and information obtained from the sample to estimate and predict the characteristics of the population studied. In this research, to investigate and test the hypotheses of the research, we first tested Kolmogorov-Smirnov test for normal values of the variables. Then, by using independent t-test, multivariate variance test is used to confirm or reject hypotheses. It should be noted that all analysis and data analysis in this study was done using SPSS software version 21.

Findings:

Statistical Indicators Describing Intrapersonal Occupational Injuries

To evaluate the component of in-person occupational injuries by using a researcher-made questionnaire (Questions 1-8), we will look at the descriptive statistics of each of these variables. In this section, in order to examine this component, we first review the average percentage of response frequency to each option in the questions that describe this variable. The table below shows the results

Table 2. Frequency distribution of answers given to questions describing in-person occupational injuries (by group)

Average Percentage of abundance		Options
Untrained	Trained	
-	-	seldom
-	26.9	Low
-	56.9	medium
90	16.2	high
10	-	High Very
100	100	Total

According to the above table, it is seen that the degree of occupational injuries within an individual more than 50 percent of the trained people is assessed as moderately downward. In contrast, 90% of the untrained people have greatly evaluated the extent of occupational injuries within the individual. Similarly, 16.2% of trained employees have a high degree of occupational injury within the individual.

In order to more accurately assess the components of intrapersonal occupational injuries, the statistical indices related to this index such as minimum, maximum, mean, standard deviation were calculated. The table shows the results obtained.

Table 3. Descriptive statistics table to examine the component of intrapersonal occupational injuries

Variance	Standard deviation	mean	maximum	minimum	Number	
0.422	0.649	2.89	4	2	130	Trained
0.091	0.301	4.10	5	4	130	Untrained

As shown in the table above, the average score of this component is 2.89 from the trained staff and 4.40 for non-trained staff.

Statistical Indicators Describing Interpersonal Occupational Damage

To evaluate the component of interpersonal occupational injuries by using a researcher-made questionnaire (Questions 9-12), we will look at the descriptive statistics of each of these variables. In this section, in order to examine this component, we first review the average percentage of response frequency to each option in the questions that describe this variable. The table below shows the results.

Table 4. Frequency distribution of the answers provided to questions describing interpersonal occupational injuries (by group)

Average Percentage of abundance		Options
Untrained	Trained	
-	11.5	seldom
-	19.2	Low
7.7	64.6	medium
73.8	4.6	high
18.5	-	High Very
100	100	Total

According to the above table, it is seen that the rate of interpersonal occupational injury is more than 50% of the trained people with a moderate downward trend. In contrast, 73.8% of untrained people have largely evaluated the magnitude of interpersonal occupational injuries. Also, 4.6% of trained workers have considered the level of interpersonal occupational injuries to a large extent.

order to more precisely determine the component of interpersonal occupational injuries, the statistical indices related to this index such as minimum, maximum, mean, standard deviation were calculated. The table shows the results obtained.

Table 5. Descriptive statistics table to examine the component of interpersonal occupational injuries

Variance	Standard deviation	mean	maximum	minimum	Number	
0.562	0.749	2.62	4	1	130	Trained
0.252	0.501	4.11	5	3	130	Untrained

As shown in the table above, the average score of this component is 2.62 for the trained workers and 4.14 for the untrained staff.

Statistical Indicators Describing Occupational Damage

To evaluate the component of interpersonal occupational injuries by using a researcher-made questionnaire (Questions 22-22), we will look at the descriptive statistics of each of these variables. In this section, in order to examine this component, we first review the average percentage of response frequency to each option in the questions that describe this variable. The table below shows the results.

Table 6. Frequency distribution of the answers given to questions describing the over-individual occupational injuries (by group)

Average Percentage of abundance		Options
Untrained	Trained	
-	-	seldom
-	15.4	Low
-	56.9	medium
84.6	27.7	high
14.4	-	High Very
100	100	Total

According to the above table, it is seen that the rate of over-individual occupational injuries is higher than 56.9% of trained people. In contrast, 84.6% of non-trained people have largely evaluated the magnitude of occupational overload. Seventy-seven percent of trained workers also have high levels of over-individual occupational injuries.

In order to more precisely determine the component of over-individual occupational injuries, the statistical indexes related to this index such as minimum, maximum, mean, standard deviation were calculated. The table shows the results obtained.

Table 7. Descriptive statistics table to examine the component of extra-personal job losses

Variance	Standard deviation	mean	maximum	minimum	Number	
0.419	0.647	3.12	4	2	130	Trained
0.131	0.362	4.15	5	4	130	

As shown in the table above, the average score of this component is 12.3 for the trained workers and 4.15 for the trained staff.

Statistical indices describing job injuries

To assess and interpret the extent of occupational injuries among trained and untrained workers in accordance with Table 2-2, based on the score obtained for each individual (total score of the questionnaire questions), the individuals were grouped according to the table below.

According to Table 8, it can be seen that the percentage of injured people in the trained group is reduced by 19.2%, the average occupational injury is 65.4%, and the number of traumatized people is high by 15.4%. In contrast, in the unknowing group, most people were at a high risk of occupational injury.

Table 8. Distribution of the answers given to questions describing the status of occupational injuries

Untrained		Trained		Interpretation
Frequency percentage	Frequency	Frequency percentage	Frequency	
-	-	19.2	25	Reduced occupational injury (no risk)
-	-	65.4	85	Medium occupational injury (at risk)
99.2	129	15.4	20	High occupational injury (at risk)
0.8	1	-	-	Very high occupational injury (at risk)
	130	100	130	total

In order to more precisely determine the component of over-individual occupational injuries, the statistical indexes related to this index such as minimum, maximum, mean, standard deviation were calculated. The table shows the results obtained.

Table 9. Descriptive statistics table to examine the total score of occupational injury

Variance	Standard deviation	mean	maximum	minimum	Number	
141.845	11.909	65.68	87	40	130	Trained
7.502	2.738	94.57	101	90	130	Untrained

As can be seen in the table above, the average total score of occupational injuries is 65/68 for trained workers, and for untrained workers, 94/57.

Inferential statistics

The statistics that are used to estimate and test hypotheses about the parameters of society from the sample are called inferior statistics. The inference from the sample cannot be conclusive, and these inferences are possible, and therefore we should base the theory on the expression of them. In fact, the ultimate goal of the inferential statistics is to estimate the characteristics of society. In this section, various analyzes have been used to analyze the research data and statistical deduction.

Exploratory Factor Analysis

The factor analysis is mainly used to reduce data or identify the structure. The purpose of data reduction is to remove additional variables from the data file, and the goal is to identify the structure of the hidden relationships between the variables. Factor analysis is a generic term for some multivariate methods whose main purpose is to summarize data. This method explains the internal correlation of a large number of variables and ultimately classifies them in the form of finite general factors. As can be seen in most statistical books, factor analysis is applicable to both exploratory factor analysis and confirmatory factor analysis. SPSS software and Cronbach's alpha coefficient are used to identify the variables and to verify the accuracy of the factor analysis model.

In conducting factor analysis, first of all, it must be ensured that existing data can be used for analysis. Using the Cronbach Alpha Coefficient Calculation, we can ensure the sampling adequacy. This index is in the range of 0 to 1. If the value of the index is close to one, the data are appropriate for factor analysis, otherwise the results of the analysis for the given data are not appropriate. More precisely, if the Cronbach's alpha value is less than 0.50, the data is not suitable for factor analysis, and if the value is between 0.50 and 0.69, then it is possible to pay more attention to factor analysis, but if its value is larger from 0.75, correlations between the data will be appropriate for factor analysis. The results of exploratory factor analysis were analyzed by SPSS software with Cronbach's alpha of 0.91 for in-person occupational injuries, 0.85 for interpersonal occupational injuries, 0.89 for fatigue-induced occupational injuries, alpha 0.95 for the whole questionnaire Occupational injuries have been confirmed.

Investigation the Normality of Research Variables

The Kolmogorov-Smirnov test was used to investigate the normality of the research variables. In this test, the null hypothesis states that "the variable in question has a normal expression in society". The statistical assumption is also stated that "the variable in question does not have a normal expression in society." Therefore, if the significance obtained (P) is greater than the desired alpha value (0.05), the assumption is zero and the variable is normalized, otherwise the variable is not normal.

Table 10. Kolmogorov-Smirnov test, to investigate the normality of the research variables

Result	Significance	Kolmogorov-Smirnov K-S test	Number	Variable
Normal.	0.71	1.39	112	intrapersonal occupational injuries
Normal.	0.92	1.46	112	Interpersonal occupational injuries
Normal.	0.99	2.21	112	Transpersonal occupational injuries
Normal.	0.86	1.48	112	Total occupational injuries

As the results of the table above show, the meaningful value of all variables in the research is greater than the theoretical alpha value of 0.05, so it is concluded that the variables in question follow the normalization hypothesis. Therefore, in order to investigate the research hypotheses, parametric tests are used.

Study hypotheses

Review the first hypothesis

The first hypothesis: Hygiene and environmental education training has had a significant effect on reducing intrapersonal occupational injuries of municipal workers.

$H_{0:}\rho\neq0$

Opposite hypothesis: Hygiene and environment education training did not have a significant effect on reducing intrapersonal occupational injuries among municipality workers.

$0=H_{1:}\rho$

To test this hypothesis, independent t-test was used to compare two trained and untrained groups.

Table 11. Study of the first hypothesis of the research using independent t-test

Significance level	Statics t	Mean Difference	Mean	Grouping component	Statistical index
0.000	24.71	-1.430	2.91	Trained workers	Occupational injuries
			4.34	Untrained workers	

According to the above table, the calculated test value is significant ($p <0.05$), so there is a significant difference between the amount of in-person occupational injuries among trained and untrained workers, and given the average score in the group of lower trained ($m = 2.91$), it can be concluded that health education and the environment significantly affected the reduction of intrapersonal occupational injuries. Therefore, the hypothesis is opposite to the rejection and the research hypothesis is confirmed with 95% confidence.

Study of the second hypothesis

Second hypothesis: Hygiene and environmental education training has a significant effect on reducing the interpersonal occupational injuries of municipality workers.

$H_{0:}\rho\neq0$

The opposite hypothesis: Hygiene and environment education training did not have a significant effect on reducing the interpersonal occupational injuries of municipality workers.

$0=H_{1:}\rho$

To test this hypothesis, independent t-test was used to compare two trained and untrained groups.

Table 12. Study of the second hypothesis of the research using independent t-test

Significance level	Statics t	Mean Difference	Mean	Grouping component	Statistical index
0.000	22.49	-1.56	2.73	Trained workers	Occupational injuries
			4.29	Untrained workers	

According to the above table, the calculated test value is significant ($p <0.05$), so there is a significant difference between the amount of interpersonal occupational injuries among trained and untrained workers, and given the average score in the group Trained lower ($m = 2.73$), it can be concluded that health education and environment significantly affected the interpersonal occupational injuries of workers. Therefore, the hypothesis is opposite to the rejection and the research hypothesis is confirmed with 95% confidence.

Review of the third hypothesis

Hypothesis 3: Hygiene and environmental education training has had a significant effect on reducing the sub-personal injury of municipality workers.

$H_{0:}\rho\neq0$

Opposite hypothesis: Hygiene and environment education training did not have a significant effect on reducing the extra-personal injuries of municipality workers.

$H_{0:}\rho\neq0$

To test this hypothesis, independent t-test was used to compare two trained and untrained groups.

Table 13. Study of the third hypothesis of the research using independent t-test

Significance level	Statics t	Mean Difference	Mean	Grouping component	Statistical index
0.000	-20.58	-1.11	3.15	Trained workers	Occupational injuries
			4.26	Untrained workers	

According to the above table, the calculated test value is significant ($p <0.05$), so there is a significant difference between the amount of over-traumatic occupational injuries of trained and untrained workers, and given the average score in the group The trained is lower ($m = 15.3$), it can be concluded that health education and the environment have significantly influenced the reduction of workers' sub-personal injury. Therefore, the hypothesis is opposite to the rejection and the research hypothesis is confirmed with 95% confidence.

Review the fourth hypothesis

Fourth hypothesis: The age factor on the effectiveness of health education and environmental education practices has affected the reduction of occupational injuries of municipality workers.

$H_{0:}\rho\neq0$

Opposite hypothesis: The age factor on the effectiveness of health and environment education training courses has not affected job losses in municipality workers.

$0=H_{1:}\rho$

In order to study this hypothesis, multivariate analysis of variance analysis was used to examine the two factors of age and group (trained and untrained).

Table 14. Study of the fourth hypothesis of the research using multivariate analysis of variance

Significant	Freedom degree error	Hypothesis	F	quantity	Impression	
0.000	250.00	3.00	8549.562	0.99	Piley effect	Intercept
0.000	250.00	3.00	8549.562	0.01	Lambadai Villex	
0.000	250.00	3.00	341.194	0.804	Piley effect	group
0.000	250.00	3.00	341.194	0.196	Lambadai Villex	
0.000	756.00	9.00	29.169	0.773	Piley effect	Age
0.000	60.585	9.00	34.731	0.365	Lambadai Villex	
0.000	756.00	9.00	19.936	0.575	Piley effect	Group * Age
0.000	68.586	9.00	22.543	0.496	Lambadai Villex	

According to the above table, the calculated test value is significant ($p <0.05$), so there is a significant difference in the amount of occupational injuries among different age groups in the trained and untrained group. Therefore, the assumption of the research is confirmed with 95% confidence. In order to study this hypothesis more precisely and to examine the status of occupational injuries in different age groups, the cross-sectional and chi-2 tests have been used. The table below shows the results of this test.

Table 15. Investigation the fourth hypothesis of the research using the cross-sectional table test

Total	Age				group		
	More than 46	36-45	26-35	18-25			
25	0	10	10	5	Reduced occupational injury	Occupational injury	Trained
85	15	49	0	21	Medium injury		
20	15	5	0	0			
130	30	64	10	26	Total		
129	37	43	40	9	High Harmful work	Occupational injury	Untrained
1	1	0	0	0	Very High Harmful work		
130	38	43	40	9	Total		

As seen in the tables, the efficacy of the mid-year and younger (less than 40 years) age groups in the trained group was higher than that of all groups.

Table 16. Study of the fourth hypothesis of the research using Chi 2 test

meaningful	Degrees of freedom	quantity	Group	
0.000	6	81.203	Qi square (Chi 2)	Trained
0.486	3	2.440	Qi square (Chi 2)	Untrained

Review the main hypothesis of the research

Main hypothesis: Hygiene and environmental education training has a significant effect on reducing the occupational injuries of municipality workers.

$H_{0:}\rho\neq0$

Opposite hypothesis: Hygiene and environmental education training did not have a significant effect on reducing the occupational injuries of municipality workers.

$0=H_{1:}\rho$

To test this hypothesis, independent t-test was used to compare two trained and untrained groups.

Table 17. Main research hypothesis using independent t-test

Significance level	Statics t	Mean Difference	Mean	Grouping component	Statistical index
0.000	95.07	-28.89	65.68	Trained workers	Occupational injuries
			94.57	Untrained workers	

According to the above table, as seen, the calculated test value is significant ($p <0.05$); therefore, there is a significant difference between the amount of occupational injuries of trained and untrained workers, and given the average score in the trained group Lower (68.65 m =), it can be concluded that health education and the environment have significantly affected the reduction of occupational injuries. Therefore, the hypothesis is opposite to the rejection and the main hypothesis of the research is confirmed with 95% confidence.

Discussion and conclusion

Each organization should have activities under the heading of safety and health management so that workers can continue to work without fear of incident and occupational diseases. These activities include the formulation of guidelines for the correct way of doing work, inspection procedures, how to measure contaminants Work environment, improvement of working environment and so on. Although industry managers have many responsibilities and responsibilities, they are committed, in accordance with the law, to the most basic occupational safety and health issues in order to prevent injury and human waste. Therefore, in order not to be regarded as a subsidiary or marginal health and health issue, and the basis of other production activities, short, medium, long-term and prioritized planning should be considered, the safety and health management system should be designed and implemented at any factory. By this system, the goals of that organization can be achieved. The overall results of the research are as follows:

According to the findings of the research, it was shown that there is a significant difference between intrapersonal occupational injuries (including physical, psychological, occupational diseases, etc.) of workers who have identified health and environment education courses and untrained people has it. The opposite hypothesis is rejected and the research hypothesis is assured with 95% confidence. This finding is consistent with the results of research by 18,19,2 0].

On the other hand, the findings of the research showed that there is a significant difference between the interpersonal occupational injuries (including damage to the people and other colleagues as well as the supervisor) of workers who have established health and environmental training courses and untrained people. Therefore, the hypothesis is opposite to the rejection and the research hypothesis is confirmed with 95% confidence. This finding is consistent with the results of the research by [21,22,23]. In the same research, they have investigated the extent of occupational injuries and the factors affecting it.

According to the findings, there is a significant difference between the over-individual occupational injuries (including occupational injury, such as salaries and financial rewards, workload, talent disputes, long-term long-term medical conditions due to occupational conditions, etc.) Workers There are health and environmental training courses and untrained people. So the opposite hypothesis is rejected and the research hypothesis is assured with 95% confidence.

Based on the findings of the research, there was also a significant difference between different age groups on the effectiveness of the training course on reducing job damage. This finding is consistent with the results of the research by [18,24]. In order to improve the efficiency of organizations and improve the training of their employees, the following suggestions are recommended:

1- Based on the results obtained, it is recommended that organizations can use the establishment of a counseling unit to reduce the damage to their employees, while it is suggested that measures be taken to reduce the staff's job losses, including the creation of facilities in various fields. For them, attention should be paid to their duties and responsibilities, respect for the position of employees and respect for them, attention to their comments and proposals, attention to the volume of work and hours of employees, in order to ensure the mental health of workers and workers.
2. According to the results, increasing the awareness of workers in the field of environmental health and safety affect the occupational injuries, so management and supervisors also need to know this and even try to make the necessary infrastructure in the organization for Strengthening the employee knowledge of workers.
3. Management in order to increase the effectiveness of such training courses, they will provide conditions in the form of salary increases, whether these benefits are in the form of contributions or increase in rewards.

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