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Research Article

The Importance, Measurement, and Comparison of the Perception of the Occupational Safety Culture in Local Governments

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Abstract

The main objective of this study is to emphasize the importance of the perceptio of Safety Culture in Local Governments, and to measure the perception of the Occupationa Safety culture in local governments through questionnaires and statistical evaluations, and t compare the same, and thus to make contribution with the aspect of Safety Culture to fiel applications of Occupational Health and Safety, which are newly introduced to public secto

In this study, the importance of safety culture in local governments will be s forth with measurement of the perception of safety culture of the employees of loc governments in the perspective of municipality services, where comparison shall be mad between two different municipalities. The aim is to establish the differences concerning th safety culture between the employees of two municipalities that differ in terms of field o services, to analyze the reasons of the difference, and to examine how close the risk leve perceived by employees are to each other and to what extent the municipality is related t the safety culture. This study is important in terms of setting an example for publ institutions and other municipalities with the points to consider to be established with th study and with the improvement of the perception of the safety culture in the concernin institutions following the study. Any comments, analyses, and assumptions to come out o the study would set a light to and guide in improvement of the safety culture.

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INTRODUCTION

The fact that our country is among the countries with the highest number of occupational accidents in the world is another point that calls for the importance required to be given to the Safety Culture. Upon a literature review on safety culture, it appears that the number of studies carried out in Turkey on safety culture and local governments is limited. It is known that the field applications of Occupational Health and Safety has been recently introduced in the public sector and the employees have been recently developing the skills to adapt to such new applications required by legal terms.

Safety and Safety Culture; The term of safety may be defined in general as: 'the feeling of being safe'. According to another definition, safety means: "to minimize possibility of a premature death, injury, or worrying conditions in order to ensure and protect the acceptable level in the existing environment". Cultural systems are not only the output of the present behaviour, but they are also the conditioner of the future behaviour. Safety should not be restricted to a mere definition in entities, but should turn into a culture where this is applied as a strategy.

Occupational accidents are globally among the most important concerns of the business life. According to the figures provided by the International Labour Organisation -ILO, 1 worker for every 15 seconds and 6300 people per day lose their lives due to an occupational accident or illness in the world. In addition, 317 millions of occupational accidents occur per year in the world, where over 2.3 millions of people die out of these accidents [1] .

It is evident that occupational accidents are an important concern of the work life in Turkey, as well as in the world. According to the data of Social Security Institution, 12.143 employees in total lost their lives to occupational accidents in Turkey in the period of 2000-2010. According to the data of Social Security Institution, 8.087 employees in total lost their lives to occupational accidents in Turkey in the period of 2011-2016. Only in 2016, 286.068 occupational accidents occurred, in which 1405 employees lost their lives [2] .

These being the official figures, it is a known fact that the actual number is more than that, when unrecorded (non-notified) accidents are taken into consideration.

1.Occupational Accident

The term 'occupational accident' is defined in law as: "An event that occurs at the workplace or due to the performance of the work, which causes death or impairs the integrity of the body, physically or spiritually" in article 3 titled as "Definitions" in Law no. 6331 [3] .

1.1 Occupational Accidents that Occur in Municipalities

As the activities carried out in municipalities may vary, the occupational accidents that might occur in municipalities are variable, as well. Due to the similarity of the activities carried out in municipalities, similar accidents are possible in similar scopes of work [4] .

Construction works were established to be the main field of activity of municipalities, which include works such as asphalt, road, sidewalks, and sewage. Along with this, it was also established that building construction and repair works, which are among the field of activities of municipalities, include accidents that might occur in construction works. It was stated that situations such as exposure of employees to chemical risks or absence of thermal-resistant shoes in asphalt works might cause occupational accidents [4] .

2.Occupational Diseases

Occupational diseases are another risk group in occupational health and safety. Occupational diseases are defined as diseases that do not appear suddenly but show up after a while.

According to article no. 18 of the Regulations on the Procedure for Determination of the Rate of Incapacity to Work and Vocational Incapacity, occupational diseases are categorized in 5 groups:

1. Group A: Occupational diseases caused by chemical substances,
2. Group B: Occupational dermatological diseases,
3. Group C: Pneumoconiosis and other occupational respiratory system diseases,
4. Group D: Occupational contagious diseases,
5. Group E: Occupational diseases caused by physical factors [5].

3.The Concept of Occupational Health and Safety

The concept of occupational health and safety is among the most emphasized concerns in recent years. It consists of two terms as occupational health and occupational safety. First of all, before defining these terms, the terms of health and safety need to be defined [6] .
According to the definition by the World Health Organization (WHO), health is a state of complete physical, mental, and social well-being. In clearer words, an individual's being healthy means a complete well-being, which includes not only the physical well-being, but also mental and social well-being[6].
When it comes to the term of occupational health, it means well-being of the worker in physical, mental, and social terms while doing his/her work. Occupational health has a wide range of impact, as it reflects to each individual in relation with the worker [6].
According to the joint committee of WHO and International Labour Organisation (ILO); occupational health aims to protect and improve the physical, mental, and social well-being of employees from every occupation to the maximum extent; to prevent workers lose their health due to conditions of work; to protect workers from the risks at the work place caused by factors harmful for the health; to provide the workers be employed in a work suitable for their physical and psychological condition, and in summary, to adapt the work to people, and to adapt every individual to his/her work [6] .

There are various definitions of occupational safety in the literature. First of all, about the concept of safety, Ringdahl defined safety as follows: "If something is not harmful and risky, it is possible to say that it is safe, but it is not an accessible condition. Instead, safety should be perceived as a value judgment. If the risk of injury in a machine or action is considered to be at an acceptable level, this machine and action should be regarded as safe [6].

Whereas occupational safety is a concept that includes the technical measures for the removal or minimization of dangers encountered by the workers while doing a work. The concept of occupational safety contains measures concerning the working environment. Occupational safety means protection of employees against the equipment used in the work place. Accordingly, it is related to determine any risks that might arise out of the equipment used in the work place and how to take protective measures against the same [6].

The essence of the concept of occupational health and safety consists of protection of employees against any risks that might arise out of the work and working environment, as well as due to the work. It is difficult to border between the concepts of occupational health and occupational safety. It is possible to see that both concepts are interchanged or taken as a whole in many definitions in hand today. However, the concept of occupational safety is a term that calls for a technical approach [6] .

3.1 Liabilities of the Employer and Employee concerning Occupational Health and Safety

Law no. 6331 on Occupational Health and Safety was published in the Official Gazette dated 30.06.2012 and no. 28339. The regulations regarding Occupational Health and Safety were gathered under a single roof [3] .

3.2 The General Situation of Occupational Health and Safety in Turkey

The number of accidents in 2013 increased around 2.5 times compared to previous years.
The number of notified occupational accidents increased to 221.366 in 2014 with a rise of about 15% from 191.389 in 2013, and increased to 241.547 in 2015 with a rise of 9% from the previous year. The number of occupational accidents informed in Turkey in 2015 is 241.547, out of which 1252 ended with death and 3.433 ended with continuous incapacity to work. In 2015, 510 people in total, out of whom 40 were women and 470 were men, caught occupational diseases. There is nobody who died of an occupational disease in 2015, as in 2014[6] .

Table 3.1: Summarized Statistics of Occupational Accidents

	2012	2013	2014	2015
Number of Occupational Accidents	74.871	191.389	221.336	241.547
Number of Occupational Diseases	395	351	494	510
Number of death due to an occupational accident	744	1.360	1.626	1.252
Number of death due to an occupational disease	1	0	0	0
Continuous Incapacity to Work	2.036	1.660	1.421	3.433
Frequency of Occupational Accidents (every 100 people)	0,58	1,32	1,47	1,52
Frequency of Occupational Accidents (1 million work hours)	2,43	5,88	6,51	6,77
Severity of Occupational Accidents (hour)	0,32	0,41	0,41	0,45
Severity of Occupational Accidents (day)	395	507	514	565

Source: Social Security Institution (SGK) Statistics Almanacs, 2015 [6].

Table 3.2: Distribution of Occupational Accidents based on Rest Periods

	Men	Women	Total	%
Accident day (capable to work)	87663	19515	107.178	44,3
Accident day (incapable to work)	5738	1073	6.811	2,8
2	9943	1677	11.620	4,8
3	13721	2222	15.943	6,6
4	3758	621	4.379	1,8
5 + (1)	86099	9517	95.616	39,5
Total	206922	36625	241.547	100,0

Source: Social Security Institution (SGK) Statistics Almanacs, 2015. [6]

3.3 An Overview of Occupational Accidents in the World

360.000 fatal occupational accidents occurred in the world in 2003 and around 2 million people died of occupational diseases in 2002. It is estimated that more than 960.000 people get injured in an occupational accident, where 5.330 workers lose their lives due to an occupational disease every day. More than half of the fatal occupational accidents and occupational diseases occur in Asia Pacific and Southeast Asian countries [7] .

4.Municipality

In application of Law no. 5393 –Article 3 –;
a) Municipality: A public legal entity established to respond to common local needs of the residents of the town, formed by the election of electors, which has an administrative and financial autonomy [8] .

Table: 4.1 Number of Municipalities in our Country in 2018 [9]

Number of Metropolitan Municipalities	30
Number of Provincial Municipalities	51
Number of Metropolitan District Municipalities	519
Number of District Municipalities	402
Number of Town Municipalities	396
Total	1398

4.1 Grounds for the Establishment of an Occupational Health and Safety System in Municipalities

Getting necessary measures concerning the employer and auditing the efficiency are emphasized in the EEC Framework Directive no. EU 89/391. The employer is liable to establish an occupational safety system (organisation) which guarantees the process in cases that require amendment and adaptation [10] .

However, article 2 titled "scope and exceptions" of Law no. 6331 on Occupational Health and Safety, which is currently in force, states that law covers all public institutions. Whereas in article 4 titled as "Employer's General Liability" of the same law, it is emphasized that establishment of the OHS system (organisation) is employer's liability [3].

5. The Term of Safety Culture

Culture is a body of ideas, emotions, and behaviours that reveal the original structure of human groups and that are expressed through created and conveyed symbols. The concept of safety culture was used for the first time in a report issued after the nuclear accident that occurred in Chernobyl in 1986. This report points out that significant design flaws, organizational mistakes, and breach of employees played an important role in the Chernobyl accident [11] .

Both in the Chernobyl accident and in other major accidents, 'safety culture' has been a key concept to explain man's role in ensuring safety, especially in cases with high risk levels[11].

A search on the concept of 'safety culture' in the literature sets forth a number of definitions made by various researchers and scientists. However, this concept was defined by IAEA (International Atomic Energy Agency) in 1991 as the assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance [11] .

IAEA (1991) established 143 questions in its report, aiming to measure the "indicators of the safety culture" at different levels. Although the number of questions and the extent to be obtained from these questions may vary depending on the institution, the fact that measurable ones are more commented on than the ones required to be measured (Cox&Flin, 1998) points out another point that calls for an answer. Cox and Flin (1998) suggested three methods to establish the "safety culture" in applications to be developed, considering sectoral and contextual factors [13] .

1) Case studies
2) Comparative studies
3) Psychometric applications [13]

5.1 Stakeholders' Role in Development of the Safety Culture

In development of the occupational safety culture;
A-Government,
B-Employer,
C-Employees/syndicates,
D-Universities, and
E-Professional organisations have their roles [12]

5.2 Development of the Safety Culture

1. Determinedness of the management
2. Definition of the desired culture
3. Formation of a common culture
4. Evaluation of the existing culture
5. Discussion about the outcomes of evaluation
6. Creation of a road map
7. Communication with team leaders and employees
8. Realization of the change [12]

6. MATERIALS and METHODS

With the study to be carried out, it is planned to establish the safety culture level of two different municipalities in Marmara region that act as the local governments in public sector and to give particular importance to occupational health and safety in all fields of services with the motto "**Give Life to People to Give Life to the State**".

Under the research, it is planned to collect data about the safety culture perceptions of the workers and officials employed in X Provincial Municipality, which is a member to Marmara Municipalities Union and Healthy Cities Network, with a population of city centre around 75.000 and in Y District Municipality, with a population of 180.000, and to analyse these data statistically, and to compare the **Safety Culture** perceptions of two municipalities.

6.1 Method

In this section of the study, the purposes and scope of the research, data collection tools, and validity and reliability levels of the data collection tools, research questions, research model, and statistical techniques used in the study are described.

6.2. Data Collection Tools

Face-to-face interview and questionnaire methods were adopted as the data collection methods of the study. The questionnaire form, which was created considering the purposes of the study, consists of three parts. The first part is the personal information form aimed to establish statistics of gender, age, education, marital status, professional experience, any experience of an occupational accident, and any experience of a near escape, the second part is the safety culture scale in order to measure the safety culture perception of the participants, for which purpose a ready scale was used in its original form, and the third part is the safety performance scale in order to measure the safety performance perception of the participants, for which purpose again a ready scale was used in its original form.

In this part of the study, studies concerning the validity and reliability of scales take place. Results of the confirmatory factor analysis applied to scales are given as an indicator of the validity of scales and Cronbach's alpha reliability coefficients are given as an indicator of their reliability.

Confirmatory factor analysis (CFA) is an examination/ supervision and test method employed for the purpose of examining the factor structures established by the use of sources, predetermined and generally accepted/ defined factor structures in original scales, or factor structures suggested as a forecast [2] .

Table 5.1 Perfect and Acceptable Fit Criteria for the Fit Indexes used in Structural Equation Modeling Studies [15]

Fit Indexes	Perfect Fit Criteria	Acceptable Fit Criteria
[1] CMIN/DF	$0 \leq \chi^2/sd \leq 2$	$2 \leq \chi^2/sd \leq 3$
[2]AGFI	.90 ≤AGFI≤ 1.00	.85 ≤AGFI≤ .90
[3]GFI	.95 ≤GFI ≤ 1.00	.90 ≤GFI ≤ 95
[3]CFI	.95 ≤CFI ≤ 1.00	.90 ≤CFI ≤ .95
[3]NFI	.95 ≤NFI ≤ 1.00	.90 ≤NFI ≤ .95
[4]RMSEA	.00 ≤RMSEA≤ .05	.05 ≤RMSEA≤ .08

Reference values for Cronbach's alpha reliability analysis are as given in table 5.2.

Table 5.2 Reference Cronabach's Alpha Coefficients [14]

Range of Coefficient	Reliability Level
X<0.50	Poor Reliability Level
0.60 > X >0.50	Reliable in a Generally Accepted Level
0.70 > X >0.60	Reliable in a Good Level
0.9 > X >0.70	Reliable in a Very Good Level
1> X >0.90	Excellently Reliable

6.3. Sampling of the Study – Application of the Questionnaire

Sampling/ Participants

Data were collected about the safety culture perceptions of 422 workers and officials in total employed in X Provincial Municipality, which is a member to Marmara Municipalities Union and Healthy Cities Network, with 165 employees and Y District Municipality with 250 employees, and these data were analysed statistically, and therefore perceptions of **Safety Culture and Safety Performance** of both municipalities were compared. The ready questionnaire forms handed out were filled in by the participants themselves and were collected back according to the deadlines given for the concerning institutions. 283 out of 300 questionnaires handed out in X Municipality were returned, where 39 of them were considered out of evaluation as they included missing data. (Rate of Return 94.3%). 252 out of 300 questionnaires handed out in Y Municipality were returned, where 74 of them were considered out of evaluation as they included missing data. (Rate of Return 84%). Total rate of return was 89.2%.

Safety Culture Questionnaire

The literature on the safety culture reveals usage of various measurement tools, which vary depending on sectors and countries. A safety culture questionnaire was formed for this study,

taking into consideration Turkey's unique cultural characteristics and making use of the scales used in this field. The aspects dealt with in the safety culture questionnaire are as follows: (Evaluation of the Scales; consists of 5 categories. As a result of the evaluation with a range of scores from 1 to 5, high scores point to a positive safety culture structure.)

a- Loyalty of Management: For the evaluation of this aspect which means loyalty of the management of the enterprise concerning safety of the employees, the scale developed by Muniz et al., (2007) was used. This scale, which consists of 8 questions in total, has two sub-aspects as the attitudes of managers and the behaviours of managers [16] .

b- Priority of Safety: The scale that is formed of 4 questions was taken from Cox and Cheyne's (2000) study. The scale evaluates how the employees perceive the level of importance given by the organisation to occupational safety [16] .

c- Communication of Safety: The scale developed by Neal et al. (2000) consists of 5 questions and evaluates the perception of employees about communication of safety between the employees and the management. It includes phrases such as "There is an open communication about safety issues in this workplace [16] .

d- Training on Safety: The scale developed by Neal et al. (2000) consists of 4 questions and measures the perception of employees concerning the training on safety provided to employees by the organisation. It includes phrases such as "Employees receive a comprehensive training on health and safety in the workplace [16] .

e- Participation of Employees: The scale, which was developed by Muniz et al. (2007) and consists of 4 questions, is aimed to measure the compliance of employees with safety procedures and their participation with the improvement of the work conditions related to safety. It includes phrases such as "Employees actively participate in the arrangement, implementation, and follow-up of the safety plan [16] .

f- Fatalism: The scale, which was developed by Rundmo and Hale (1999) and consists of 6 questions, evaluates the fatalist beliefs of employees regarding occupational accidents. It includes phrases such as "Accidents are inevitable." and "What we are going to experience while working is a matter of chance to a great extent" [16] .

g- **Awareness and Competence of Safety:** The scale, which was developed by Lin et al. (2008) and consists of 5 questions, is to evaluate awareness of safety and competence of employees in coping with safety concerns. It includes phrases such as "I can cope with safety concerns in my workplace." and "I think safety is the most important thing while working." [16] .

6.4. Safety Performance Questionnaire

a- Safe Behaviour and Participation to Safety

The scale developed by Neal et al. (2000) is aimed to evaluate the safe behaviours of employees concerning their completion of works in a safe manner. The scale consists of two sub-aspects as compliance of safety (3 questions) and participation to safety (3 questions). The aspect of compliance of safety, which includes phrases such as "I use all the necessary safety equipment while doing my work.", is to evaluate completion of the work in a safe manner and complying with safety procedures. The aspect of participation to safety, which includes 3 questions such as "I perform any duties and activities to help improvement of safety at work voluntarily.", is to evaluate behaviours which are not directly related to the personal safety of employees but help with the development of a supporting safety environment. In the generality of the scale, participants give their answers in 5 categories from "I don't agree at all" to "I totally agree" [16] .

7.RESULTS AND DISCUSSION

In this part of the study, the results obtained from questionnaires are given in tables and with comments.

7.1. Descriptive Statistics and Results

This part of the study includes demographic and work-related descriptive statistics of the participants employed in Y and X municipalities. The statistics about the demographic characteristics of employees are as given in Table 6.1

Table 6.1 Demographic Statistics of Participants

Demographic Characteristics		Y Municipality		X Municipality	
		n	%	n	%
Gender	Woman	28	15.7%	31	12.7%
	Man	150	84.3%	213	87.3%
Age	Ages 15-25	4	2.2%	8	3.3%
	Ages 26-35	21	11.8%	78	32.0%
	Ages 36-45	65	36.5%	96	39.3%
	Ages 46-55	72	40.4%	53	21.7%
	56 and Over	16	9.0%	9	3.7%
Marital Status	Married	145	81.5%	197	80.7%
	Single	26	14.6%	43	17.6%
	Divorced/Widowed	7	3.9%	4	1.6%
Educational Background	Primary and Secondary School	61	34.3%	102	41.8%
	High School	62	34.8%	69	28.3%
	College	29	16.3%	26	10.7%
	Faculty	23	12.9%	40	16.4%
	Master's Degree and Over	3	1.7%	7	2.9%

The statistics of participants employed in Y and X municipalities about their descriptive characteristics concerning occupation and occupational accidents are as follows.

Table 6.2 Descriptive Statistics concerning Occupation

Descriptive Characteristics concerning Occupation		Y Municipality		X Municipality	
		n	%	n	%
Period of Employment in the Institution	0-2 Years	19	10.7%	77	31.6%
	2-5 Years	11	6.2%	56	23.0%
	5-10 Years	38	21.3%	59	24.2%
	More than 10 Years	110	61.8%	52	21.3%
Professional Experience	0-2 Years	16	9.0%	72	29.5%
	2-5 Years	15	8.4%	59	24.2%
	5-10 Years	35	19.7%	59	24.2%
	More than 10 Years	112	62.9%	54	22.1%
Position in the Workplace	Manager	19	10.7%	16	6.6%
	Employee	159	89.3%	228	93.4%
Any Experience of Occupational Accident	Yes	21	11.8%	16	6.6%
	No	157	88.2%	228	93.4%
Occupational Accident in the Current Workplace	Yes	6	3.4%	10	4.1%
	No	172	96.6%	234	95.9%
Near Escapes	Yes	11	6.2%	26	10.7%
	No	167	93.8%	218	89.3%

7.2. Descriptive Statistics and Results

This part of the study includes the descriptive statistics of the scales and sub-aspects, which are the measurement tools of the study, and the normal distribution tests of scales and sub-aspects. The descriptive statistics of scales and sub-aspects are as given in table 6.3.

Table 6.3 Descriptive Statistics of Scales and Sub-Aspects

Variant	N	Minimum	Maximum	Average	Std. Deviation
Loyalty of Management	422	1.00	5.00	3.7541	.87548
Priority of Safety	422	1.00	5.00	3.4414	.78622
Communication of Safety	422	1.00	5.00	3.4412	.96932
Training on Safety	422	1.00	5.00	3.4771	.94330
Participation of Employees	422	1.00	5.00	3.4414	.94298
Fatalism	422	1.00	5.00	3.2176	1.00387
Awareness of Safety	422	1.00	5.00	3.9427	.84866
Safe Behaviour	422	1.00	5.00	3.8404	.91486
Participation to Safety	422	1.00	5.00	3.7694	.91033
Safety Performance	422	1.00	5.00	3.8049	.85878

The sub-aspect of loyalty of management is 1 in minimum, 5 in maximum, 3.75 in average, and with a standard deviation of 0.88. The sub-aspect of priority of safety is 1 in minimum, 5 in maximum, 3.41 in average, and with a standard deviation of 0.79. The sub-aspect of communication of safety is 1 in minimum, 5 in maximum, 3.41 in average, and with a standard deviation of 0.97. The sub-aspect of training on safety is 1 in minimum, 5 in maximum, 3.47 in average, and with a standard deviation of 0.94. The sub-aspect of participation of employees is 1 in minimum, 5 in maximum, 3.44 in average, and with a standard deviation of 0.94. The sub-aspect of fatalism is 1 in minimum, 5 in maximum, 3.21 in average, and with a standard deviation of 1.03. The sub-aspect of awareness of safety is 1 in minimum, 5 in maximum, 3.94 in average, and with a standard deviation of 0.85. The sub-aspect of safe behaviour is 1 in minimum, 5 in maximum, 3.84 in average, and with a standard deviation of 0.91. The sub-aspect of participation to safety is 1 in minimum, 5 in maximum, 3.76 in average, and with a standard deviation of 0.91. The scale of safety performance is 1 in minimum, 5 in maximum, 3.8 in average, and with a standard deviation of 0.86. The statistics of normal distribution tests of scales and sub-aspects are as given in table 6.4.

Table 6.4 Statistics of Normal Distribution Tests of Scales and Sub-Aspects

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	s.d	Sig.	Statistic	s.d	Sig.
Loyalty of Management	.080	422	.000	.950	422	.000
Priority of Safety	.131	422	.000	.953	422	.000
Communication of Safety	.095	422	.000	.965	422	.000
Training on Safety	.126	422	.000	.951	422	.000
Participation of Employees	.111	422	.000	.961	422	.000
Fatalism	.094	422	.000	.971	422	.000
Awareness of Safety	.108	422	.000	.925	422	.000
Safe Behaviour	.131	422	.000	.922	422	.000
Participation to Safety	.136	422	.000	.931	422	.000
Safety Performance	.118	422	.000	.943	422	.000

A review of the table reveals that significance values (sig.) of the statistics of normal distribution tests calculated for all scales and sub-aspects are less than 0.05. In this case, it is possible to say that statistically normal distribution could not be attained for all scales and sub-aspects at a reliability level of 95% (sig.<0.05). Scales and sub-aspects have a skew distribution and non-parametric test techniques should be adopted in the analyses to be performed.

7.3. Analysis and Evaluation of Research Questions/Discussion

In this part of the study, considering that variant types and variants might not distribute normally, questions of study were tested with appropriate test statistics and results were given in tables and with comments.

Mann Whitney U and Kruskall Wallis H tests were applied for the reply of research questions based on the review of the differences between groups. Mann Whitney U test compares the medians of groups. It turns the values of continuous variants in two groups into an ordinal form. Thus, it evaluates whether the order between two groups is different or not. As the values are turned into an ordinal form, the main distribution of values is not of importance. It is sufficient if the data are at least in an ordinal scale. Null hypothesis and an alternative hypothesis for the Mann Whitney U test are as follows:

H_0: Samples were taken from the universe or the universes from where the samples were taken are not different from each other. (In this case, there is not any difference between samplings.)

H_1: Samples were taken from different universes or the universes from where the samples were taken are different from each other. (In this case, there is difference between samplings.)[17].

Kruskall Wallis H test is a test that is mostly used in the test of the null hypothesis, which expresses that more than two independent samples were taken from the same universe, and that is a good alternative to one-way analysis of variance (ANOVA). Hypotheses for the Kruskall Wallis H test are as follows:

H_0: Samples were taken from the same universe or the universes from where the samples were taken are not different from each other. (In this case, there is not any difference between samplings.)

H_1: Samples were taken from a different universe or the universes from where the samples were taken are different from each other. (In this case, there is difference between samplings.)[17].

The asymptotic sig. value calculated in both the Kruskall Wallis H test and the Mann Whitney U test should be compared to 0.05 for a reliability level of 95% and if sig. is >0.05, null hypothesis should be accepted, if sig. is <0.05, the alternative hypothesis should be accepted.

Research Question 1: Statistically no significant difference was found between the employees of the X and Y municipalities in terms of perception of safety culture at a reliability level of 95%. The statistics of the Mann Whitney U test performed for the answering of the research question are as given in table 6.5.

Table 6.5 Statistics of the Mann Whitney U Test to Find Out the Differences between the Employees of the Y and X Municipalities in Terms of Perception of Safety Culture

Variant	Municipality	N	Average	Average Order	Z	sig.
Loyalty of Management	Y Municipality	178	3.744	210.096	-0.203	0.839
	X Municipality	244	3.762	212.525		
Priority of Safety	Y Municipality	178	3.463	215.694	-0.609	0.542
	X Municipality	244	3.425	208.441		
Communication of Safety	Y Municipality	178	3.439	208.466	-0.439	0.661
	X Municipality	244	3.443	213.713		
Training on Safety	Y Municipality	178	3.597	224.444	-1.883	0.060
	X Municipality	244	3.389	202.057		
Participation of Employees	Y Municipality	178	3.404	207.399	-0.595	0.552
	X Municipality	244	3.468	214.492		
Fatalism	Y Municipality	178	3.241	211.761	-0.038	0.970
	X Municipality	244	3.201	211.309		
Awareness of Safety	Y Municipality	178	3.935	208.323	-0.461	0.645
	X Municipality	244	3.948	213.818		

Statistically no significant difference was found between the employees of the Y Municipality (O.S) and employees of the X municipality (O.S) in terms of perception of safety culture at a reliability level of 95% (sig.>0.05). Mann Whitney U test was applied for the reply of the research question.

Research Question 2: Statistically no significant difference was found between women and men employees of municipalities in terms of perception of safety culture at a reliability level of 95%. Mann Whitney U test was applied for the reply of the research question.

Research Question 3: Statistically no significant difference was found between employees of municipalities of different age groups in terms of perception of safety culture at a reliability level of 95%. Kruskal Wallis H Test was applied for the reply of the research question.

Research Question 4: Statistically significant differences were found between employees of municipalities of different educational backgrounds in terms of perception of safety culture at a reliability level of 95%. Kruskal Wallis H Test was applied for the reply of the research question.

- Perception of Loyalty of Management; The results of the paired comparisons made for the determination of educational group(s) as the source of difference are as follows: According to employees with an educational background at primary and secondary school level, loyalty of management to safety in their institutions is higher than all participants with a higher level of educational background.
- Perception of Communication of Safety; The results of the paired comparisons made for the determination of educational group(s) as the source of difference are as follows: According to employees with an educational background at primary and secondary school level, perception of communication of safety in their institutions is higher than all participants with a higher level of educational background.
- Perception of Participation of Employees; The results of the paired comparisons made for the determination of educational group(s) as the source of difference are as follows: According to employees with an educational background at primary and secondary school level, perception of participation of employees in their institutions is higher than all participants with a higher level of educational background.

Research Question 5: Statistically significant differences were found between married and single employees of municipalities in terms of perception of safety culture at a reliability level

of 95%. Statistics of the Kruskal Wallis H Test were applied, performed for the reply of the research question.

- In terms of the sub-aspect of Loyalty of Management; Paired comparisons made for the determination of the group(s) as the source of difference found out that single employees had a higher perception of loyalty of management than married employees.
- In terms of the sub-aspect of Fatalism; paired comparisons found out that divorced or widowed employees had a higher perception of fatalism than married employees.

Research Question 6: Statistically no significant difference was found between the employees of municipalities with different periods of professional experience in terms of perception of safety culture at a reliability level of 95%. Kruskal Wallis H Test was applied for the reply of the research question.

Research Question 7: Statistically no significant difference was found between the employees of municipalities who had and who did not have an experience of occupational accident in terms of perception of safety culture at a reliability level of 95%. Mann Whitney U Test was applied for the reply of the research question.

Research Question 8: Statistically no significant difference was found between the employees of municipalities who had and who did not have an experience of near escape in terms of perception of safety culture at a reliability level of 95%. Mann Whitney U Test was applied for the reply of the research question.

Research Question 9: Statistically no significant difference was found between the employees of X and Y municipalities in terms of perception of safety performance at a reliability level of 95%.

The statistics of the Mann Whitney U Test performed for the reply of the research question is as in the following table 6.6

Table 6.6 Statistics of the Mann Whitney U Test to Find Out the Differences between the Employees of the Y and X Municipalities in Terms of Perception of Safety Performance

Variant	Municipality	N	Average	Average Order	Z	sig.
Safe Behaviour	Y Municipality	178	3.813	207.267	-0.618	0.536
	X Municipality	244	3.861	214.588		
Participation to	Y Municipality	178	3.751	208.795	-0.395	0.693

Safety	X Municipality	244	3.783	213.473		
Safety Performance	Y Municipality	178	3.782	208.654	-0.412	0.680
	X Municipality	244	3.822	213.576		

Statistically no significant difference was found between the employees of the Y Municipality (O.S) and employees of the X municipality (O.S) in terms of perception of safety performance at a reliability level of 95% (sig.>0.05). Mann Whitney U test was applied for the reply of the research question.

Research Question 10: Statistically significant differences were found between woman and man employees of municipalities in terms of perception of safety performance at a reliability level of 95%. Statistics of the Kruskal Wallis H Test were applied, performed for the reply of the research question.

- Statistically significant differences were found in terms of perception of Participation to Safety at a reliability level of 95%. Review of average ordinal values reveals that perception of participation to safety of man participants is higher than woman participants.
- Statistically significant differences were found in terms of perception of Safety performance at a reliability level of 95%. Review of average ordinal values reveals that perception of safety performance of man participants is higher than woman participants.

Research Question 11: Statistically no significant difference was found between employees of municipalities of different age groups in terms of perception of safety performance at a reliability level of 95%. Kruskal Wallis H Test was applied for the reply of the research question.

Research Question 12: Statistically no significant difference was found between employees of municipalities of different educational backgrounds in terms of perception of safety performance at a reliability level of 95%. Kruskal Wallis H Test was applied for the reply of the research question.

Research Question 13: Statistically no significant difference was found between single and married employees of municipalities in terms of perception of safety performance at a

reliability level of 95%. Kruskal Wallis H Test was applied for the reply of the research question.

Research Question 14: Statistically no significant difference was found between the employees of municipalities with different periods of professional experience in terms of perception of safety performance at a reliability level of 95%. Kruskal Wallis H Test was applied for the reply of the research question.

Research Question 15: Statistically no significant difference was found between the employees of municipalities who had and who did not have an experience of occupational accident in terms of perception of safety performance at a reliability level of 95%. Statistics of the Mann Whitney U Test were applied, which was made for the reply of the research question.

Research Question 16: Statistically no significant difference was found between the employees of municipalities who had and who did not have an experience of near escape in terms of perception of safety performance at a reliability level of 95%. Statistics of the Mann Whitney U Test were applied, which was made for the reply of the research question.

8.CONCLUSION

The figures of occupational accidents, which place our country among the first ones in the world, underline the importance required to be given to the Safety Culture. Upon a literature review on safety culture, it appears that the number of studies carried out in Turkey on safety culture and local governments is limited. It is known that the field applications of Occupational Health and Safety has been recently introduced in the public sector and the employees have been recently developing the skills to adapt to such new applications required by legal terms.

With the study carried out, it is planned to establish the safety culture level of two different municipalities in Marmara region that act as the local governments in public sector and to give particular importance to occupational health and safety in all fields of services with the motto "**Give Life to People to Give Life to the State**".

Data were collected about the safety culture perceptions of 422 workers and officials in total employed in X Provincial Municipality, which is a member to Marmara Municipalities Union and Healthy Cities Network, with 165 employees and Y District Municipality with 250 employees, and these data were analysed statistically, and therefore perceptions of Safety Culture and Safety Performance of both municipalities were compared. The ready questionnaire forms handed out were filled in by the participants themselves and were collected back according to the deadlines given for the concerning institutions. 283 out of 300 questionnaires handed out in X Municipality were returned, where 39 of them were

considered out of evaluation as they included missing data. (Rate of Return 94.3%). 252 out of 300 questionnaires handed out in Y Municipality were returned, where 74 of them were considered out of evaluation as they included missing data. (Rate of Return 84%). Total rate of return was 89.2%.

Statistically no significant difference was found between the employees of the Y Municipality (O.S) and employees of the X municipality (O.S) in terms of perception of safety culture at a reliability level of 95% (sig.>0.05). Mann Whitney U test was applied for the reply of the research question.

Statistically no significant difference was found between the employees of the Y Municipality (O.S) and employees of the X municipality (O.S) in terms of perception of safety performance at a reliability level of 95% (sig.>0.05). Mann Whitney U test was applied for the reply of the research question.

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