

Root Cause Model Proposal For Human-Related Risks In Occupational Health And Safety Practices Of Special Provincial Administrations

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Abstract: Special provincial administrations are autonomous institutions based on the efficiency and effectiveness of local public services, where the people of the region contribute more to the management and democratic elements find a more comprehensive development environment. Local services provided by private administrations directly affect human life. The aim of the study is to propose a root cause model for risks based on human factors in the occupational health and safety (OHS) practices of special provincial administrations. In the research, OHS practices in special provincial administrations were examined. In the section, the importance of OHS in special provincial administrations, the causes of occupational accidents and occupational diseases, and the measures that can be taken to prevent occupational accidents and occupational diseases are included. The research was conducted on employees of special provincial administrations. While the population of the research consists of 11,463 people working in special provincial administrations, the sample was determined as 372 people with a confidence level of 0.95 and a margin of error of 0.05, and the study was conducted with 372 people. SPSS 22.00 was used to analyze the research data. Independent sample t-test was used to compare independent pairs of groups, and one-way variance test was used to compare three or more independent groups. In the study conducted on human-induced risks, OHS practices scores were compared according to the demographic information of the participants, and the relationship between the sub-dimensions and the root cause were examined. The direct and indirect effects of the root problem and cause factor on work accidents were examined. In addition, a root cause analysis was made in the research and a model proposal was made for human-induced.

İl Özel İdarelerinin İş Sağlığı ve Güvenliği Uygulamalarında İnsan Kaynaklı Risklere Yönelik Kök Sebep Modeli Önerisi

Anahtar Kelimeler

İl Özel İdareleri,
İş Kazası,
İş Sağlığı ve
Güvenliği

Öz: İl özel idareleri, bölge insanların daha çok yönetime katkı sağladığı, demokratik unsurların daha kapsamlı bir kalkınma ortamı bulduğu yerel kamu hizmetlerinin verimliliğine ve etkinliğine dayanan otonom kurumlardır. Özel idarelerde sunulan mahalli hizmetler, insan yaşamını doğrudan etkilemektedir. Çalışmada il özel idarelerinin iş sağlığı ve güvenliği (İSG) uygulamalarında insan faktörüne dayalı risklere yönelik, kök sebep modeli önerisinde bulunulması amaçlanmıştır. Araştırmada, il özel idarelerinde İSG uygulamaları konusu incelenmiştir. Bölüm içerisinde il özel idarelerinde İSG'nin önemi, iş kazaları - meslek hastalarının nedenleri, iş kazaları ile meslek hastalıklarının önlenmesinde alınabilecek tedbirlere yer verilmiştir. Araştırma il özel idareleri çalışanları üzerinde yapılmıştır. Araştırmanın evrenini il özel idarelerinde çalışan 11.463 kişi oluştururken örneklemi ise 0.95 güven, 0.05 hata payı ile 372 kişi olarak belirlenmiş ve 372 kişi ile çalışma yapılmıştır. Araştırma verilerinin analizinde SPSS 22.00 kullanılmıştır. Bağımsız ikili grupların

karşılaştırılmasında bağımsız örneklem t-test, üç ve daha fazla bağımsız grupların karşılaştırılmasında ise tek yönlü varyans testi kullanılmıştır. İnsan kaynaklı risklere yönelik yapılan çalışmada, katılımcıların demografik bilgilerine göre İSG uygulamaları puanları karşılaştırılmış, alt boyutlarıyla arasındaki ilişki ve kök neden durumu incelenmiştir. İş kazalarına kök sorun ve neden faktörünün doğrudan ve dolaylı etkileri incelenmiştir. Bununla birlikte araştırmada kök sebep analizi yapılarak insan kaynaklı risklere yönelik bir model önerisi yapılmıştır.

1. INTRODUCTION

Public administration units are of great importance in solving social problems that are intertwined with society in many areas. In parallel with the population growth, there is an increase in the problems that the state needs to solve, and this leads to an increase in the services provided by the state.

The duties, responsibilities and authorities of special provincial administrations are shared between metropolitan municipalities and the state according to their importance in big cities. The study examines the impact of the reform on occupational health and safety of employees in special provincial administrations in Turkey on provincial governments. Community coexistence may mean that people have a desire for a well-managed local governance model. The state determines the need for these demands. The continuous development of social needs and expectations forces institutions to find new resources. For this reason, issues such as the production, transmission and management of public services bring to the fore the need for public administration.

Due to changing conditions and management needs in the constantly developing world, an ongoing construction process has entered the management strategy. In this reform process in Turkey, the understanding of local administrations is being restructured and it is possible to say that many things have changed. The most important one is the creation of municipalities and special provincial administrations. In order to meet the general needs of the provincial population, special administratively and economically autonomous provincial administrations are established, whose decision-making bodies are elected by local voters.

In this study, which was carried out to examine human-related risks in the OHS practices of special provincial administrations, which are a part of local governments, the purpose of OHS in special provincial administrations, the causes of work accidents, approaches to the causes of work accidents in special provincial administrations, the causes of work accidents, work accidents in special provincial administrations and issues regarding the measures that can be taken to prevent accidents are mentioned. It is aimed to propose a root cause model for human-related risks in the OHS practices of special provincial administrations.

In the literature research, the effects of whether the personnel working in special provincial administrations have sufficient knowledge among the main causes of work accidents and occupational diseases were examined. In addition, the importance of factors such as the level of employees in the sector regarding the risks and dangers in their working environments, what differences there are based on factors such as employee awareness, employee education level, age, working hours and previous injuries are mentioned in this research. In this study, it is emphasized that original training plans should be created with different techniques to protect employees from risks in the workplace and to increase their awareness of risks.

Purpose of the research

This study aims to examine the factors related to human-related risks in the occupational health and safety practices of special provincial administrations. Accordingly, the current dangers in terms of health and occupational safety of all employees in special provincial administrations and the risks that they may be involved in have been investigated.

Importance of the research

When the general structure of special provincial administrations is examined, it is observed that they employ personnel in a large number of different working areas. From past to present, technological and scientific advances as well as the development of transportation and communication have affected the distance between rural and urban living standards and caused them to become increasingly closer. Due to this situation, it has become a necessity to provide the same service standards offered by municipalities in rural areas. While services such as irrigation, sewerage, zoning and road works, drinking water, park and garden arrangements, cemetery works and cleaning works in settlements are provided by municipalities in cities; the same services are provided by special provincial administrations in rural areas such as villages and hamlets. [1].

Due to this situation, the occurrence of work accidents and occupational diseases becomes an inevitable situation. After the Occupational Health and Safety Law No. 6331 came into force, more attention is paid to occupational safety than in the past in order to avoid legal sanctions. Personnel working in special provincial administrations must

benefit from health and safety activities in addition to training and performance evaluation duties. It is seen that in workplaces where research on OHS is carried out, it has become mandatory to include OHS in the daily routine in personnel services. In accordance with the purposes of OHS practices, it is important for personnel services to closely follow the development of legislation in the field of labour law and social security.

Various variables such as the size of the business area of special provincial administrations, many different hazard categories and the number of employees emphasize the importance of the research.

Assumptions of the research

Ethics Committee Decision dated 21.02.2023 and numbered 444 was taken for the research.

During the execution of the study; * those who participate in the survey will give sincere and accurate answers to the survey questions. * The employees of the special provincial administrations that constitute the sample group must be representative of the population of the research.

Limitations of the research

Participants will be limited to employees of special provincial administrations, provided that they do not have any mental or communication disabilities.

Causes of work accidents in special provincial administrations

Studies have concluded that the materials used during work play a major role in accidents.

Causes of accidents due to human behaviour (human reasons); they are grouped as personal elements, physiological elements and psychological elements. Accident causes related to physical and mechanical environmental conditions (technical reasons); It is also divided into sub-sets as accident causes related to machinery, accident causes related to production regulations, and accident causes related to environmental conditions.

Causes of accidents related to human behaviour

It is stated that when explaining the causes of occupational accidents or occupational diseases that may occur during work, especially the causes related to human behaviour, it is important to express the concepts of "frequency rate of work accidents", "risk of work accidents" and "proneness of work accidents" in order to better understand the subject [2].

According to the Domino Theory of Work Accidents, when all the mechanisms in the enterprises are taken into consideration, it is obvious that the major factor in the processes until the accident occurs is caused by human-caused dangerous actions and situations. Managerial incompetence, personal inadequacy (lack of

experience, carelessness, forgetfulness, etc.), dangerous situations and actions are the sources of accidents [3].

Personal elements

When talking about individual characteristics that cause work accidents to occur, the first thing that comes to mind is the individuals' age, gender, marital status, position, work experience, education level and habits. There is a connection between the individual characteristics of employees and the high number of accidents in businesses [2].

Physiological elements

Physiological factors, which are one of the factors that cause accidents; although it has not been clearly demonstrated that fatigue, monotony, physical inadequacy and insomnia are indicators of accidents, it has been Psychological Elements

Psychological elements

Psychological factors, which are one of the factors that may affect the occurrence of accidents while performing work; it is examined under the headings of intelligence, emotional state, accident proneness, tension (stress), job satisfaction-motivation.

Causes of accidents due to unsafe conditions and environments

In this regard, the working system, ergonomic structure and physical characteristics of the workplace, which are among the causes of work accidents, are generally mentioned.

Causes of accidents due to physical and mechanical environmental conditions in special provincial administrations

It is known that there are two important concepts in the emergence of the concept of health and safety in the workplace. These concepts are called risk and danger. As a general rule, risk is expressed as the risk area and problem for expansion. The main purpose of health and safety activities is to minimize the problems that may arise from these risks. If evaluated only from this perspective, the importance of the subject has emerged again [5].

Causes of accidents due to physical and mechanical environmental conditions in Special Provincial Administrations; * Causes of Accidents Due to Machinery * Causes of Accidents Due to Production Organizations * Causes of Accidents Due to Environmental Factors * Causes of Accidents Due to Unexpected Events.

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Measures that can be taken to prevent work accidents in special provincial administrations

Statistics show that work accidents and occupational injuries occur every 4 minutes in Turkey. Every minute, 640 people are exposed to work accidents. The cost of accidents that occur when adequate measures for OHS are not taken is 4% of the Gross Domestic Product [6].

Looking at the research, it has been understood that a significant part of work accidents can actually be prevented with simple measures. Failure to take these simple precautions creates negative consequences in workplaces. Measures that can be taken in workplaces to prevent work accidents and occupational diseases can be listed as follows:

Benefiting from the science of ergonomics

Ergonomics science ensures that employees increase productivity and performance by designing the workplace in line with the psychological and physical conditions of the individual, so that they can be active in the workplace in an efficient, safe and healthy way, and by complying with OHS rules. Attention should be paid to the way of working in front of the screen, which is frequently used in office environments, the screens being at eye level and at a certain distance, the low height level, sitting and standing height [7].

Going automated and using personal protective

In industry, management and technical and scientific works, it is important to perform tasks with automatically functioning tools without any

effort [8]. Thanks to the devices, tasks are carried out and employees are removed from dangerous situations. Organizational and technical initiatives are used to ensure occupational safety. Since these techniques eliminate occupational safety risks, they are relatively preferable to the use of personal protective equipment [9].

Organization of occupational safety studies

In the statement in Article 80 of the Labour Law No. 4857, the prevailing opinion is that the measures to be taken in the field of OHS should be taken in the business environment. It is seen that the workplaces that make up the organization are successful in combating work accidents. The issue of occupational safety becomes institutional in businesses within the scope of occupational safety organization. Thus, in addition to the advantages of job security, it is also possible for employees to participate in management, resulting in safer working environments in business life [10].

Training of employees on occupational health and safety

Education is very important when solving OHS-related problems. Article 4 of the OSH Law regulates the responsibility for training that must be provided by the employer, and the employer is obliged to provide organization and take precautions.

2. MATERIAL AND METHOD

In the research, the OHS management practices scale was used primarily to determine the OHS practices of special provincial administrations. The scale was created by adapting Christopher et al.'s article [11] and Glendon and Litherland's safety climate survey. The scale consists of 5 sub-dimensions and is scored with a 5-point Likert system (1: Strongly disagree, 5: Strongly agree).

While the population of the research consists of 11,463 people working in special provincial administrations, the sample was determined as 372 people with a confidence level of 0.95 and a margin of error of 0.05, and the study was conducted with 372 people.

SPSS 22.00 was used to analyse the research data. Independent sample t-test was used to compare independent pairs of groups, and one-way variance test was used to compare three or more independent groups. It was determined that the scale scores showed normal distribution. Histograms, graphs and coefficients of variation related to the relevant scales and dimensions were also examined and it was determined that they were suitable for normal distribution. Additionally, analyzes were carried out using parametric methods. In addition, a root cause analysis was made in the research and a model proposal was made for human-induced risks. Root

Cause Analysis is the work done to identify the real causes. It is a process application that focuses on producing permanent solutions rather than eliminating the apparent causes of problems. In this research, human-related risks were identified in special provincial administrations.

This study was conducted to conduct a root cause study to examine human-related risks in the OHS practices of special provincial administrations and to determine whether the scores they received from the OHS management practices scale changed according to the demographic information of the participants.

For this study, an Ethics Committee Certificate was received from Istanbul Gedik University Ethics Committee Commission with letter dated 21.202.2023 and numbered 444.

3. RESULTS

In this section of the study, the findings of the data obtained from the research and the evaluation of the findings are included.

Table1. Validity and Reliability Analysis of the Research

	Item Numbers	Cronbach Alpha Reliability Coefficients
Security Procedures and Risk Management	6	0.75
Safety and Health Rules	7	0.74
First Aid Support and Training	5	0.71
Preventing Work Accidents	7	0.74
Organizational Security Support	5	0.88
Occupational Health and Safety Practices	30	0.92

Cronbach's alpha coefficient was calculated to determine the validity and reliability of the scale used in the study. As a result of the analyses, the Cronbach alpha coefficient of the scale was found to be 0.92. In order for the scale to be considered

reliable, Cronbach's alpha value must be 0.70 and above [12]. The coefficient value being greater than 0.70 indicates that the scale used in this research has high reliability.

Table 2. Normality Analysis of the Research

	Average	Standard deviation	Skewness	Kurtosis
Security Procedures and Risk Management	3,8642	,71877	-,967	,120
Safety and Health Rules	3,8821	,66708	-1,140	,388
First Aid Support and Training	3,9032	,66136	-,997	,075
Preventing Work Accidents	3,9578	,63722	-,928	,029
Organizational Security Support	3,9011	,55965	-,800	,032
Occupational Health and Safety Practices	3,9017	,55967	-,961	,011

It is considered sufficient for normal distribution if the kurtosis and skewness values obtained from the scale scores are between +3 and -3. Accordingly, it

was determined that the scale scores showed a normal distribution. In this context, analyses were carried out with parametric methods.

Table 3. Distribution of Participants' Demographic Information

		Frequency (n)	Percentage (%)
Gender	Female	166	44,6
	Male	206	55,4
	Total	372	100,0
Age	18-25	70	18,8
	26-34	105	28,2
	35-44	68	18,3
	45-55	62	16,7
	56 and over	67	18,0
	Total	372	100,0
Educational Status	Primary School	19	5,1
	Secondary School	38	10,2
	High School	45	12,1
	Associate's Degree	97	26,1
	Bachelor's Degree	144	38,7
	Postgraduate	29	7,8
Total	372	100,0	
Year of Working in This Job	Less than 10 years	107	28,8
	10-20 years	93	25,0
	20-30 years	87	23,4
	30 and over	85	22,8
	Total	372	100,0
Knowledge of OSH Law and Practices	Yes	196	52,7
	Some	102	27,4
	No	74	19,9
	Total	372	100,0

Having had a work accident at this workplace before	Yes	108	29,0
	No	264	71,0
	Total	372	100,0
Having had a Near Miss Incident at this workplace before	Yes	146	39,2
	No	226	60,8
	Total	372	100,0

Of the participants in the study, 166 were women and 206 were men. 70 of the participants are between the ages of 18-25, 105 are between the ages of 26-34, 68 are between the ages of 35-44, 62 are between the ages of 45-55 and 67 are aged 56 and over. 19 of them are primary school graduates, 38 are secondary school graduates, 45 are high school graduates, 97 are associate degree graduates, 144 are undergraduate and 29 are graduate graduates. 107 of them have been working in this job for less than 10 years, 93 for 10-20 years, 87 for

20-30 years, and 85 for more than 30 years. 196 of the participants have knowledge about OSH law and its practices, 102 have some knowledge, and 74 have no knowledge. While 108 of them had experienced a work accident in this workplace before, 264 of them had not experienced a work accident in this workplace before. While 146 of them had experienced a near miss in this workplace before, 226 of them had not experienced a near miss in this workplace before.

Table 4. Findings Regarding the Difference in OHS Practices Scores According to the Gender of the Participants

	Gender	N	Average	Standard deviation	t	p
Security Procedures and Risk Management	Female	166	3,8785	,75710	,340	,734
	Male	206	3,8528	,68799		
Safety and Health Rules	Female	166	3,9079	,69168	,669	,504
	Male	206	3,8613	,64753		
First Aid Support and Training	Female	166	3,9253	,65816	,577	,564
	Male	206	3,8854	,66500		
Preventing Work Accidents	Female	166	3,9828	,56178	,695	,488
	Male	206	3,9376	,69275		
Organizational Security Support	Female	166	3,9482	,46965	1,503	,134
	Male	206	3,8631	,62133		
Occupational Health and Safety Practices	Female	166	3,9285	,55553	,831	,407
	Male	206	3,8800	,56340		

According to the independent sample t test conducted to determine the differences in OHS practices scores of the participants in the study according to their gender, no statistically significant

differences could be detected between them ($p > 0.05$). Accordingly, OHS practices scores do not vary by gender.

Table 5. Findings Regarding the Difference in Occupational Health and Safety Practices Scores According to the Age of the Participants

		N	Average	Standard deviation	F	P
Preventing Work Accidents	18-25	70	4,2347	,70071	13,083	,000
	26-34	105	3,8966	,67720		
	35-44	68	3,8277	,58645		
	45-55	62	4,2396	,31124		
	56 and over	67	3,6354	,56833		
	Total	372	3,9578	,63722		
Organizational Security Support	18-25	70	3,6914	,54127	9,491	,000
	26-34	105	4,1162	,47619		
	35-44	68	4,0059	,66823		
	45-55	62	3,7226	,68841		
	56 and over	67	3,8418	,20162		
	Total	372	3,9011	,55965		
Occupational Health and Safety Practices	18-25	70	4,0667	,74871	9,929	,000
	26-34	105	3,8980	,57329		
	35-44	68	3,9388	,40003		
	45-55	62	4,0527	,26026		
	56 and over	67	3,5576	,50970		
	Total	372	3,9017	,55967		

According to the one-way variance test performed to determine the differentiation of OHS practices scores of the participants according to their ages, statistically significant differences were detected between them ($p < 0.05$). Accordingly, the total averages of safety procedures and risk management, safety and health rules, first aid support and training, occupational health and safety practices of those aged 18-25 are; Total occupational accident prevention averages for those aged 45-55; the total average of organizational security support for those aged 26-34 is higher.

Table 6. Findings regarding the difference in OHS practices scores according to the educational status of the participant

	Educational Status	N	Average	Standard deviation	F	P
Preventing Work Accidents	Primary School	19	4,1429	,00000	20,680	,000
	Secondary School	38	3,8872	,79516		
	High School	45	3,6889	,46818		
	Associate's Degree	97	4,3829	,23829		
	Bachelor's Degree	144	3,6984	,74242		
	Postgraduate	29	4,2118	,07265		
	Total	372	3,9578	,63722		
Organizational Security Support	Primary School	19	3,8000	,00000	4,279	,001
	Secondary School	38	3,7053	,10120		
	High School	45	4,0933	,34536		
	Associate's Degree	97	3,9072	,70537		
	Bachelor's Degree	144	3,8417	,62796		
	Postgraduate	29	4,2000	,00000		
	Total	372	3,9011	,55965		
Occupational Health and Safety Practices	Primary School	19	3,9552	,00000	19,895	,000
	Secondary School	38	3,7458	,63083		
	High School	45	3,7160	,51992		
	Associate's Degree	97	4,2689	,27610		
	Bachelor's Degree	144	3,6866	,63377		
	Postgraduate	29	4,1990	,00000		
	Total	372	3,9017	,55967		

Statistically significant differences were detected between the OHS practices scores according to the educational level of the participants ($p < 0.05$). Total averages of associate degree graduates' safety procedures and risk management, safety and health

rules, first aid support and training, occupational accident prevention, occupational health and safety practices; Postgraduate graduates' total organizational security support averages are higher.

Table 7. Findings regarding the difference in participants' OHS practice scores according to working year

		N	Average	Standard deviation	F	P
Security Procedures and Risk Management	Less than 10 years	107	3,8660	1,02317	1,926	,125
	10-20 years	93	3,9677	,34948		
	20-30 years	87	3,8966	,72526		
	More than 30 years	85	3,7157	,50318		
	Total	372	3,8642	,71877		
Safety and Health Rules	Less than 10 years	107	3,7490	,95929	5,084	,002
	10-20 years	93	4,0522	,45410		
	20-30 years	87	3,9787	,55136		
	More than 30 years	85	3,7647	,43460		
	Total	372	3,8821	,66708		
First Aid Support and Training	Less than 10 years	107	3,8411	,93475	2,182	,090
	10-20 years	93	4,0151	,45990		
	20-30 years	87	3,9632	,59340		
	More than 30 years	85	3,7976	,45092		
	Total	372	3,9032	,66136		
Preventing Work Accidents	Less than 10 years	107	3,9119	,85143	,850	,467
	10-20 years	93	4,0184	,58342		
	20-30 years	87	4,0049	,54744		
	More than 30 years	85	3,9008	,43197		
	Total	372	3,9578	,63722		
Organizational Security Support	Less than 10 years	107	3,6542	,50250	40,627	,000
	10-20 years	93	4,3720	,28831		
	20-30 years	87	3,8046	,52825		
	More than 30 years	85	3,7953	,58633		
	Total	372	3,9011	,55965		
Occupational Health and Safety Practices	Less than 10 years	107	3,8045	,77587	5,721	,001
	10-20 years	93	4,0851	,41543		
	20-30 years	87	3,9296	,46807		
	More than 30 years	85	3,7948	,38576		
	Total	372	3,9017	,55967		

According to the one-way variance test performed to determine the differentiation of OHS practices scores of the participants according to the working year, statistically significant differences were detected between the working year and occupational health and safety practices and its sub-

dimensions, safety and health rules and organizational safety support ($p < 0.05$). Accordingly, the total averages of OHS practices and sub-dimensions of safety and health rules and organizational security support of employees with 10-20 years of experience are higher.

Table 8. Findings Regarding the Difference in OHS Practices Scores According to the Participants' Knowledge of the OSH Law and Practices

		N	Average	Standard deviation	F	P
Security Procedures and Risk Management	Yes	196	3,7381	,79564	6,995	,001
	Some	102	4,0458	,47150		
	No	74	3,9482	,72880		
	Total	372	3,8642	,71877		
Safety and Health Rules	Yes	196	3,7923	,74439	6,092	,002
	Some	102	4,0714	,47177		
	No	74	3,8591	,63338		
	Total	372	3,8821	,66708		
First Aid Support and Training	Yes	196	3,8102	,72232	4,471	,012
	Some	102	4,0392	,49154		
	No	74	3,9622	,66512		
	Total	372	3,9032	,66136		
Preventing Work Accidents	Yes	196	3,8899	,65686	2,674	,070
	Some	102	4,0014	,57019		
	No	74	4,0772	,65708		
	Total	372	3,9578	,63722		
Organizational Security Support	Yes	196	3,9296	,60743	1,373	,255
	Some	102	3,9157	,49826		
	No	74	3,8054	,50093		
	Total	372	3,9011	,55965		
Occupational Health and Safety Practices	Yes	196	3,8320	,61526	3,750	,024
	Some	102	4,0147	,40971		
	No	74	3,9304	,56279		
	Total	372	3,9017	,55967		

According to the one-way variance test conducted to determine the differentiation of OHS practices scores according to the participants' knowledge about the OSH law and practices, knowledge about the OSH law and practices and OSH practices and its sub-dimensions include safety procedures and risk management, safety and health rules, first aid

support and statistically significant differences were detected between education levels ($p < 0.05$). Accordingly, the total averages of those who have some knowledge are higher on OHS practices and its sub-dimensions: safety procedures and risk management, safety and health rules, first aid support and training.

Table 9. Findings Regarding the Difference in OHS Practices Scores According to the Participants' Previous Occupational Accident in This Workplace

	Having previously had an occupational accident at work	N	Average	Standard deviation	t	p
Security Procedures and Risk Management	Yes	108	3,8302	,56553	-,663	,508
	No	264	3,8782	,77331		
Safety and Health Rules	Yes	108	3,9947	,53378	2,353	,019
	No	264	3,8360	,71027		
First Aid Support and Training	Yes	108	3,9481	,52123	,951	,342
	No	264	3,8848	,71086		
Preventing Work Accidents	Yes	108	4,0026	,48592	1,002	,317
	No	264	3,9394	,68961		
Organizational Security Support	Yes	108	4,2574	,26518	11,406	,000
	No	264	3,7553	,58288		
Occupational Health and Safety Practices	Yes	108	4,0066	,46815	2,558	,011
	No	264	3,8587	,58849		

According to the independent sample t test conducted to determine the difference in OHS practices scores according to the participants' previous occupational accidents at the workplace, statistically significant differences were detected between having a previous occupational accident at this workplace and OHS practices and its sub-

dimensions, safety and health rules and organizational safety support. ($p < 0.05$). Accordingly, the total averages of OHS practices and sub-dimensions of safety and health rules and organizational safety support are higher for those who experienced a work accident.

Table 10. Findings Regarding the Difference in OHS Practices Scores According to the Participants' Previous Near Miss Incident at This Workplace

	Having Had a Near Miss Incident at This Workplace Before	N	Average	Standard deviation	t	p
Security Procedures and Risk Management	Yes	146	4,1712	,63877	7,041	,000
	No	226	3,6659	,69876		
Safety and Health Rules	Yes	146	4,0773	,56227	4,882	,000
	No	226	3,7560	,69951		
First Aid Support and Training	Yes	146	4,1562	,56641	6,446	,000
	No	226	3,7398	,66794		
Preventing Work Accidents	Yes	146	4,2221	,52362	7,126	,000
	No	226	3,7870	,64667		
Organizational Security Support	Yes	146	3,7589	,60750	-	,000
	No	226	3,9929	,50697	4,018	
Occupational Health and Safety Practices	Yes	146	4,0771	,47406	5,240	,000
	No	226	3,7883	,58204		

Statistically significant differences were detected between the participants in the study according to the independent sample t test performed to determine the difference in their OHS practices scores according to whether they had previously experienced a near-miss incident in this workplace ($p < 0.05$). Accordingly, the OHS practices and sub-

dimensions of those who experienced a near-miss incident include safety procedures and risk management, safety and health rules, first aid support and training, prevention of work accidents; the total average of organizational security support for those who did not experience a near-miss incident was higher.

Table 11. Findings Regarding the Examination of the Relationship Between OHS Practices and Sub-Dimensions

		Security Procedures and Risk Management	Safety and Health Rules	First Aid Support and Training	Preventing Work Accidents	Organizational Security Support	Occupational Health and Safety Practices
Security Procedures and Risk Management	Pearson Correlation	1					
	Sig						
	N	372					
Safety and Health Rules	Pearson Correlation	,961**	1				
	Sig	,000					
	N	372	372				
First Aid Support and Training	Pearson Correlation	,984**	,987**	1			
	Sig	,000	,000				
	N	372	372	372			
Preventing Work Accidents	Pearson Correlation	,945**	,950**	,981**	1		
	Sig	,000	,000	,000			
	N	372	372	372	372		
Organizational Security Support	Pearson Correlation	,108*	,230**	,165**	,145**	1	
	Sig	,037	,000	,001	,005		
	N	372	372	372	372	372	
Occupational Health and Safety Practices	Pearson Correlation	,955**	,981**	,981**	,958**	,355**	1
	Sig	,000	,000	,000	,000	,000	
	N	372	372	372	372	372	372

** . The correlation is significant at the 0.01 level (2-tailed).

* . The correlation is significant at the 0.05 level (2-tailed).

As a result of the study, no statistically significant differences could be detected between the participants according to the independent sample t test performed to determine the differences in OHS practices scores according to their gender ($p > 0.05$). Accordingly, OHS practices scores do not vary by gender.

As a result of the Pearson Correlation test conducted to examine the relationship between OHS practices and its sub-dimensions, the relationship between OHS practices and its sub-dimensions, such as safety procedures and risk management, safety and health rules, first aid support and training, and occupational accident

prevention, is found to be at a high level; A moderate, statistically significant relationship was detected between organizational security support and organizational security support ($p < 0.01$). Accordingly, its sub-dimensions positively affect occupational health and safety practices.

In his study, Arat [13] found that the awareness levels and knowledge levels of the participants regarding OHS practices did not vary by gender, there was no statistically significant difference between the groups, the awareness levels of the participants regarding OHS practices differed by gender, and there was a statistically significant difference between the groups.

In this study, no statistically significant differences could be detected between the participants according to the independent sample t test conducted to determine the differences in OHS practices scores according to their gender ($p > 0.05$). Accordingly, OHS practices scores do not vary by gender.

In his study, Arat [13] found that the knowledge, consciousness and awareness levels of the participants regarding OHS differed according to age, and that there was a statistically significant difference between the groups.

In this study, significant differences were detected in the OHS practices scores of the participants according to their ages ($p < 0.05$). Accordingly, the total averages of safety procedures and risk management, safety and health rules, first aid support and training, occupational health and safety practices of those aged 18-25 are; Total occupational accident prevention averages for those aged 45-55; the total average of organizational security support for those aged 26-34 is higher.

As a result of his study, Çelik [14] found that the security communication, security participation and security perception scores of the participants did not show statistically significant differences according to the educational level variable. He stated that there was no difference according to the educational level of the participants, security perception, security communication and security participation.

In his study, Arat [13] found that the awareness levels of the participants regarding OHS did not differ according to their educational level, there was no statistically significant difference between the groups, and the awareness levels and knowledge levels of the participants regarding OHS differed according to the educational level, and it was determined that there was a statistically significant difference between the groups.

In this study, statistically significant differences were detected in OHS practices scores according to the educational level of the participants ($p < 0.05$). Total averages of associate degree graduates' safety procedures and risk management, safety and health rules, first aid support and training, occupational accident prevention, OHS practices; Postgraduate graduates' total organizational security support averages are higher.

In his study, Çelik [14] found that the security participation scores of those with less than 1 year of professional experience (3.467 ± 0.747) were higher than the security participation scores of those with 1-5 years of professional experience (2.961 ± 0.801), and that the security participation scores of those with 11 years or more of

professional experience were higher (3.471 ± 0.738), the security participation scores of those with 1-5 years of professional experience are higher than (2.961 ± 0.801), the security participation scores of those with less than 1 year of professional experience are (3.467 ± 0.747), the security participation scores of those with 6-10 years of professional experience are higher, the security participation scores of those with 11 years of professional experience and above (3.471 ± 0.738) were higher than the security participation scores of those with 6-10 years of professional experience (2.834 ± 0.699).

In his study, Arat [13] found that the awareness levels of the participants regarding OHS did not differ according to professional experience, there was no significant difference between the groups, the awareness levels and knowledge levels of the participants regarding OHS differed according to professional experience, and there was a significant difference between the groups.

In this study, according to the one-way variance test conducted to determine the differentiation of occupational health and safety practices scores of the participants according to their knowledge about the OHS law and its practices, knowledge about the OSH law and its practices and occupational health and safety practices and its sub-dimensions, statistically significant differences were detected between safety procedures, risk management, safety and health rules, first aid support and training ($p < 0.05$). Accordingly, those who have some knowledge have higher total averages of occupational health and safety practices and sub-dimensions of safety procedures and risk management, safety and health rules, first aid support and training.

In this study, statistically significant differences were detected among the participants according to the independent sample t test, which was conducted to determine the difference in occupational health and safety practices scores according to whether they had previously experienced a near-miss incident in this workplace ($p < 0.05$). Accordingly, the occupational health and safety practices of those who experienced a near-miss incident and its sub-dimensions include safety procedures and risk management, safety and health rules, first aid support and training, prevention of work accidents; the total average of organizational security support for those who did not experience a near-miss incident was higher.

As a result of the Pearson Correlation test conducted to examine the relationship between occupational health and safety practices and their sub-dimensions as a result of the data obtained from the study, occupational health and safety practices and their sub-dimensions include safety procedures

and risk management, safety and health rules, first aid support and training, occupational accidents high level of prevention; a moderate, statistically significant relationship was detected between organizational security support and organizational

security support ($p < 0.01$). Accordingly, its sub-dimensions positively affect occupational health and safety practices.

Table 12. Root Cause Analysis [15]

	Root	Cause
Stress, Inattention, Interest		+
Safe Behavior Awareness	+	+
Workplace Environment	+	+
Oral-Written Instructions		+
Legal regulations		+
Equipment	+	+
Problem Concept	+	+
Problem Determination	+	+
Problem Solving	+	+
Security Trainings		+
Hardware		+
Personal Protective Equipment		+
Markings		+
Positive Security Criteria	+	+
Security Policies	+	+
Accident Reports		+
Update	+	+
Improvement	+	+
Employees	+	+
Management-Administration	+	+
Experts	+	+
Auditors		+
Risk Factors	+	+

The root factor, which is classified in two separate categories as root and cause and shown in red in Table 12, has both an indirect and direct effect on the occurrence of accident cases. The reason factor shown in yellow has an indirect effect on the occurrence of accident events. As a result of the research conducted to examine human-related risks, the expressions employees, management - administration and experts are the root problem and indirectly affect the results. Although inspectors, legal regulations, equipment, personal protective equipment, markings and accident reports are not the root problem, they are among the direct causes of the result. Expressions such as verbal and written instructions, safety training, stress, carelessness, interest and intensity are not the root problem, but they are indirect causes. Risk factors, equipment, problem concept, problem identification, problem solving, positive security criteria, security policies, updating, safe behaviour awareness, workplace environment and improvement statements are the root problems and are the reasons that directly affect the results [15].

The root problem in job security is that the security culture is immature in underdeveloped or developing societies. Based on the ability of safety culture to learn and teach, people's awareness of safe behaviour should begin to be transferred from their birth.

Developing technologies should be used in OHS training, which is the most important element in the formation of a safety culture. As a result of the research; the use of artificial intelligence technology and virtual reality-based applications in

training studies ensures that occupational health and safety trainings are highly efficient and effective, increases permanent results in the mind, provides advantages in acquiring knowledge, reduces training costs, contributes to the prevention of work accidents and occupational diseases, and increases the motivation of employees. It is stated that it has positive effects on the formation of a safety culture by instilling the habit of safe behaviour [16].

Cell (security awareness) - Most cellular characteristics are genetically transmitted from parents to new generations. Although the concepts of problem, problem determination and problem solving are acquired through learning, they are generally related to the level of intelligence and are acquired through hereditary means.

Texture (safety culture in the family) - Human beings begin to receive their first education from the family starting from infancy. Thus, all employees derive the foundation of safety culture from their families.

Organ (safety culture in the enterprise) - Management, supervisors and experts serve as the basic organs such as the eyes and ears of the enterprise.

System (industrial safety culture) - In order for the system to run smoothly in the machine order in industrial enterprises; Legal regulations, verbal and written instructions, past accident reports and OHS training are very important.

Organism (national security culture) - Positive security criteria, security policies, awareness of safe behaviour, continuous improvement and updating

steps throughout the country are the most important steps in the formation of national security culture.

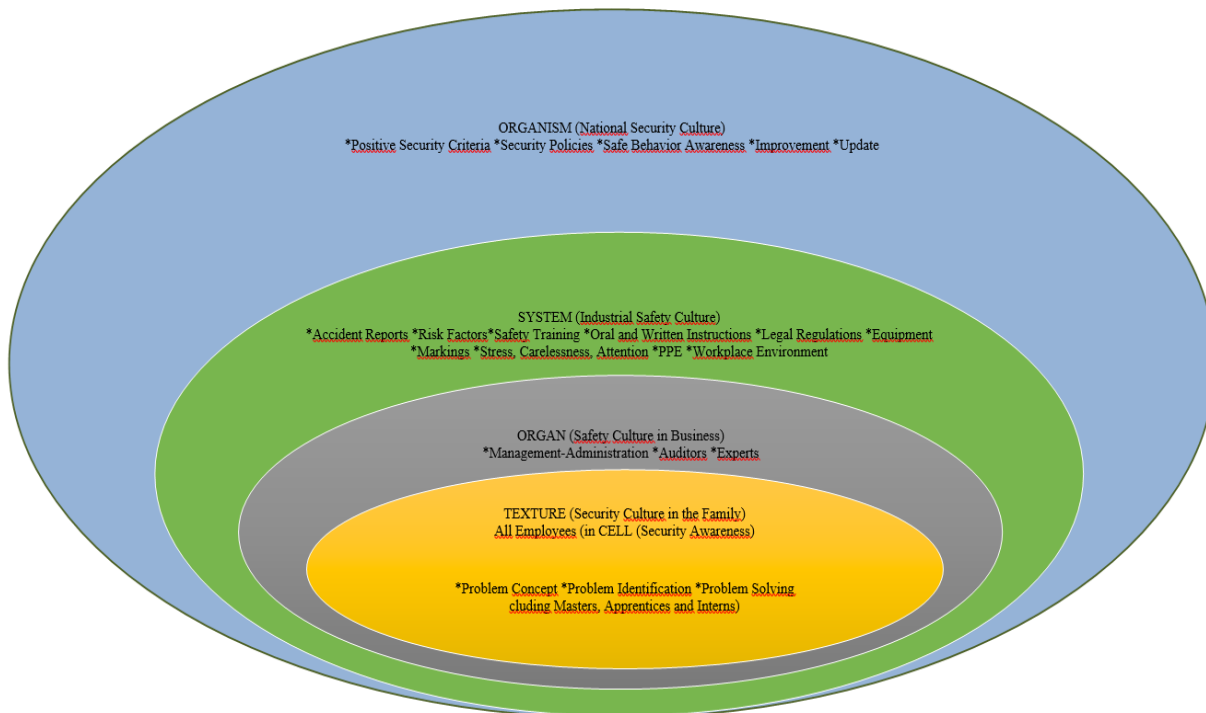


Figure 1. Root Cause Organism Model [15]

If the root cause factors from the cell to the organism are examined and the necessary preventive measures are taken in the light of scientific studies, it is envisaged to eliminate 98% of human-caused dangerous situations and dangerous movements and to prevent 100% of occupational accidents and occupational diseases.

4. DISCUSSION AND CONCLUSION

Turkey ranks third in the world and first in Europe in terms of occupational accidents. These losses or injuries cause significant losses, both material and moral, as well as for personnel. This scenario also shows the importance of occupational health and safety. Employers are expected to take all necessary precautions for the health and safety of their employees, correct unsafe working conditions and fulfill all other legal obligations.

For employees who spend one-third of their lives at work, a safe and even encouraging working environment and conditions such as cleanliness may seem expensive for employers at first, but they have become a necessity in terms of productivity.

Occupational health and safety is a branch of science that must be implemented proactively. Organizations must prevent accidents before they happen, rather than after, to protect the health and safety of employees and to review and control the inevitable at the source.

Within the scope of this study conducted on human-related risks in the occupational health and safety practices of special provincial administrations, the scores of occupational health and safety practices were compared according to the demographic information of the participants, and the relationship between them and their sub-dimensions and the root cause were examined.

As a result of the research conducted to examine human-related risks, employees, management - administration expressions are the root problem and indirectly affect the results. Although inspectors, legal regulations, equipment, personal protective equipment, markings and accident reports are not the root problem, they are among the direct causes of the result. Expressions such as verbal and written instructions, safety training, stress, carelessness, interest and intensity are not the root problem, but they are indirect causes. Risk factors, equipment, problem concept, problem identification, problem solving, positive security criteria, security policies, update and improvement statements are the root problems and are the reasons that directly affect the results.

Occupational health and safety legislation for special provincial administrations will increase employer employment and productivity. In the working environment, it is important for the consultant and personnel employed in the consultancy unit to be directly connected to the person responsible for occupational health and safety as employees in a reporting unit, to ensure their professional

independence in accordance with ethical principles and uninterrupted business continuity. In order to identify the hazards and risks present in the special provincial administration units and the deficiencies in the risk assessments to be made and to prevent functional and competence conflicts with other institutional units in the implementation of health and safety-related measures in the workplace, the workplace should be organized hierarchically together with the health and safety unit. It is very important to guarantee that workplace physicians, occupational safety specialists and other health personnel, especially those in decision-making positions in special provincial administrations, can work without being influenced by the administration. One of the most important factors in ensuring that health and safety in the workplace is addressed in detail and adopted by all employees is for employers to express the importance and support they give to this issue. To solve this problem, a health and safety policy that explains the importance of health and safety in the workplace must be established and management must be committed to implementing this policy. This policy and the employer's obligation towards it must be prepared and delivered to all employees, both for the work to be done within the private administrations and for the general secretary and unit directorates. In this regard, the study includes issues aimed at preventing risks in public institutions, aiming to ensure that personnel working in special provincial administrations work in healthy working conditions.

5. SUGGESTIONS

- Since the root cause of occupational accidents and occupational diseases is the human factor, the human factor at the focal point must be taken into consideration as a priority at all stages, starting from the cell (safety awareness) specified in the Organism Model to the formation of the organism (national safety culture).
 - Based on the principle of "If there are no people, there will be no work accidents or occupational diseases", emphasis should be given to studies on the cultural development and change of humans in all OHS studies.
 - In order to create a safety culture in special provincial administrations, OHS awareness should be created among employees and activities should be organized to transform the created awareness into a permanent form of behavior.
 - Occupational health and safety legislation implementations for special provincial administrations will increase employer employment and productivity. Legislation needs to be constantly renewed and keep pace with developments.
 - It is very important to guarantee this independence, especially for employees in management or decision-making positions in special provincial administrations.
- One of the most important factors for employers to ensure that health and safety in the workplace is handled well and adopted by all employees is that they express the importance and support they give to this issue.
- A health and safety policy should be established that explains the importance of health and safety in the workplace, and management should be committed to implementing this policy. This policy and the employer's obligation towards it must be prepared and communicated to all employees, both for the work to be done within the private administrations and for the general secretary and unit directorates.
 - First of all, providing OHS training and employment training by using new technologies such as virtual reality-based and artificial intelligence technologies instead of theoretical / traditional methods will contribute to the training being more effective, more efficient and more successful.
 - By organizing events where employees can express themselves, the problems they encounter in the work environment should be asked, their opinions should be taken and employees should be made to feel that they are valuable to the organization.
 - Employees who are successful in occupational health and safety practices should be rewarded.
 - The success of the study is directly proportional to the number of participants. For this reason, more participants should be able to participate in new OHS studies.
 - Situations that pose security problems should be examined in detail in new studies.
 - More emphasis can be given to occupational health training in the public sphere, and staff awareness can be increased through in-service training.
 - Necessary improvement works should be carried out to create a healthy and safe environment by performing risk analysis and risk assessment at regular periods.
 - OHS performances should be monitored at workplaces at regular intervals and development processes should be followed.
 - Workplace employees should be aware of safe behaviour in the workplace environment.
 - All individuals, including management, should take responsibility to create an OHS culture in all workplaces.
 - More accurate and clear results can be obtained by researchers with more sample groups.

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REFERENCES

- [1] Erdem M. Comparative analysis of special provincial administrations in terms of OHS: Bingöl and Elazığ example: Master's thesis. Istanbul: Istanbul Esenyurt University Institute of Science and Technology; 2019.
- [2] Camkurt M. Z. The Effect of Personal Characteristics of Employees on the Occurrence of Work Accidents: TÜHİS Journal of Labor Law and Economics. 2013; 24(6).
- [3] Kuzucuoğlu H. Human-induced risk factors in preventive protection. In: Gedük S, Kuzucuoğlu A. editors. Preventive protection in cultural heritage practices. Hypercast; 2021; p.47-59
- [4] Biçer E. Study on the causes, costs and prevention of work accidents: Master's thesis. Ankara: Gazi University; 2007.
- [5] Algün A. General Principles of Worker Health and Safety, TMMOB Emo Ankara Branch Newsletter; 2014.
- [6] Bilir N. Occupational Health and Safety Profile. Ministry of Labor and Social Security General Publication No: 62. Türkiye: 2017.
- [7] Akpınar T, Çakmakkaya, B. Y., & Batur, N. Ergonomic Science as a Solution Proposal for Protecting the Health of Office Workers: Journal of Balkan and Near East Social Sciences. 2018; 4(2): 76-98.
- [8] Karaçor M, Keleş K. Components of automation systems. VI. Automation Symposium, Samsun: 2007.
- [9] Wentz C. A. Safety, Health And Environmental Protection. McGraw-Hill Book Company; Boston 1998.
- [10] Süzek S. Participation in labor law, gift to Coşkun Kırca. Galatasaray University, 1996. Ankara: 161-168. (Participation)
- [11] Christopher P, Xin H, Marimuthu A, Linic S. Singular characteristics and unique chemical bond activation mechanisms of photocatalytic reactions on plasmonic nanostructures. Nature materials. 2012; 11(12): 1044-1050.
- [12] Tavşancıl E, Keser H. Development of a likert type attitude scale towards internet usage: Journal of Educational Sciences & Practices. 2002; 1(1).
- [13] Arat O. Analysis of the knowledge, consciousness and awareness of employees in the human resources department regarding occupational health and safety: A field research: Master's thesis. Istanbul: Istanbul University Institute of Social Sciences; 2022.
- [14] Çelik E. A field research to examine the awareness of healthcare professionals regarding occupational health and safety: Master's thesis. Istanbul: Istanbul Gelişim University Institute of Social Sciences; 2016.
- [15] Tunca F, Utlu Z. Root, cause and effect relationship in occupational safety: Journal of Istanbul Aydın University; 2016; 8 (31): 1-14
- [16] Gök Y. Examining the effect of virtual reality applications in occupational health and safety education: Master's thesis. Konya: Selçuk University; 2022.