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Research Article

Türkiye'de İş Sağlığı ve Güvenliği Eğitimlerinin Elektrik Dağıtım Sektörü Açısından Değerlendirilmesi

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Öz

İş sağlığı ve güvenliği günümüz çalışma hayatının ve iş hukukunun önemli bir parçasını oluşturmaktadır. İşyerlerinde ilgili yasa ve yönetmeliklere uygun olarak alınan önlemler katı bir yaklaşımla uygulandığında iş kazaları ve meslek hastalıklarının azaltılması mümkündür. Bu uygulamalar sonucunda işçi, işveren ve sosyal güvenlik sistemlerinin sürdürülebilirliği açısından önemli sonuçlar elde edilmektedir.

Bu çalışmada iş sağlığı ve güvenliği eğitiminin etkilerinin belirlenmesi amaçlanmıştır. Bu nedenle ÇEDAŞ AŞ çalışanlarına verilen eğitim, eğitim öncesi ve sonrası uygulanan anketler ile değerlendirilmiştir. Bu değerlendirme sonucunda iş güvenliği eğitiminin önemli bir başarı sağladığı kanıtlanacaktır.

Anahtar Kelimeler: Güvenlik, Sağlık İş güvenliği, Güvenlik eğitimi değerlendirmesi.

Evaluation of Occupational Health and Safety Training in Turkey in Terms of Electricity Distribution Sector

Abstract

Occupational health and safety constitute an important part of today's working life and labor law. When the measures taken in line with the relevant laws and regulations in workplaces are implemented with a strict approach, it is possible to reduce work accidents and occupational diseases. As a result of these practices, important results are obtained in terms of the sustainability of workers, employers and social security systems.

In this study, it is aimed to determine the effects of occupational health and safety training. Therefore, the training given to ÇEDAŞ AŞ employees was evaluated with the questionnaires applied before and after the training. As a result of this evaluation, it will be proven that occupational safety training has provided a significant success.

Keywords: Safety, Health Occupational safety, Safety training evaluation.

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1. Giriş

The amount of electrical energy consumption is a parameter used in the development measure of countries (Batlle, et al., 2020) (Atsu, Adams, & Adjei, 2021). Electricity plays a vital role in every sector such as transportation, communication and industry (Wang, et al., 2021) (Li & Yuan, 2021). However, this means that every day millions of workers are at risk of an accident from electrical contact, which is a major concern. These risks should not be ignored. Electrical shocks, fires and arcing are considered as primary risks (Albert & Hallowell, 2013). A large number of electrical work accidents occur in Turkey and in the world (Marshall, Hirmas, & Singer, 2018). In order to prevent these accidents, it is important to strictly implement occupational safety measures in electrical work. Apart from these risks, it can be said that electrical fires are also an important safety problem (Kılıç, 2018) (Asgary, Ghaffari, & Levy, 2010).

Taking and implementing occupational health and safety measures and reducing work accidents and occupational diseases are mandated by laws and regulations in Turkey. With the implementation of the security measures taken, important benefits have emerged for workers and employers, as well as positive results for the social security system. The main purpose of occupational safety measures is to prevent work accidents and occupational diseases before they occur.

Between 2015-2019, around 34800 work accidents occurred in Turkey and an average of 1390 people lost their lives. In Table 1, the number of active insured for the years 2015-2019, the number of insured persons who had a work accident according to their incapacity for work, the number of insured persons who died as a result of a work accident and the number of those who died among those working in electrical-electronic works are given. Although there were no significant changes in the number of insured persons in this five-year period, it is observed that the number of insured persons who had work accidents increased continuously according to their duration of incapacity for work, and despite this increase in accidents, there was no significant increase in the number of insured persons who died as a result of work accidents. According to Heinrich's domino theory, 88% of all accidents are caused by unsafe actions of people, 10% by unsafe conditions and 2% by uncertain actions (Cordon, Mestre, & Walliser, 2017). It is important to ensure that employees behave safely in order to prevent occupational accidents (Ajslev, et al., 2017). In order to control employee behavior, it is necessary to raise awareness of employees. It is clear that occupational health and safety training should be emphasized in order to raise awareness of the employees.

Occupational safety training is a very important component of the safety climate (Christian, Bradley, Wallace, & Burke, 2009) (Tharenou, 2001). For this reason, as in many countries, in Türkiye, especially those working in high-risk occupations are required to attend safety training. On the other hand, although some researchers believe that compulsory education is not more effective than optional education, all researchers agree that OHS education should be provided (Curado, Henriques, & Ribeiro, 2015) (Aziz & Selamat, 2016) (Tai, 2006). Rather than discussing whether OHS training is compulsory or voluntary, it is more accurate to determine the impact of OHS training. In terms of human resources, the effectiveness of education is defined as the achievement of educational goals (Noe & Kodwani, 2018) (Kirkpatric, 1959). There are four levels in the Kirkpatrick assessment model: response, learning, behavior, and outcome (Kirkpatrick, 1996) (Giangreco, Carugati, & Sebastiano, 2010). However, assessment of behavior and outcome level may be more difficult than response and learning (Kaya, Günay , & Damgacı, 2015). The effects of education have been studied by many researchers and it has been shown that education has a significant impact (Grau, Martinez, Agut, & Salanova, 2002) (Holte & Kjestveit, 2012) (Ricci, Chiesi, Bisio, Panari, & Pelosi, 2016).

In this article, the material method is given in the second part, the evaluation of the survey results according to the gender and age groups of the participants in the third part, the evaluation of the survey results with the H test in the fourth part, and the evaluations of the results are given in the fifth part, respectively.

Table 1. SGK occupational accident data for the years 2019-2021 (SGK, 2021)

	2019	**2020**	**2021**
Number of active insured	22.000.964	23.344.547	24.745.149
Number of insured persons who had a work accident according to their incapacity for work	422.463	384.262	511.084
Number of insured persons who died as a result of work accident	1.147	1.231	1.382
Number of insured persons who died among those working in electrical and electronic works	24	40	37

2. Materyal ve Metot

2.1. Material

Occupational safety practices in Turkey are determined by the Occupational Health and Safety Law No. 6331. Occupational safety training has been made compulsory with the law numbered 6331, and the scope and practices of the training have been determined in line with the Regulation on the Procedures and Principles of Occupational Health and Safety Training of Employees. The scope of education in this regulation; It consists of general topics, health topics and technical topics. In order to measure the reaction and learning

level of the employees corresponding to the first two levels of the Kirkpatrick evaluation model, two multiple-choice questionnaires with 20 questions were applied before and after the training, among the subjects determined by the Regulation and including the situations that may be encountered in the electricity distribution sector. The subjects determined by the regulation and the distribution of the survey questions within these subjects are given in Table 2.

Although there were the same number of questions under each topic, different order of questions was applied in both surveys. In the workplace, 65 volunteer employees were randomly selected to represent different occupational groups. In the questionnaires, each question was evaluated separately and the average success of the participants was calculated to determine the response and learning level of the education. For the question(s) with a success average of less than 50%, it is recommended to conduct a completion training in which the relevant issues are addressed as a priority.

The results of the joint analysis of the first and second survey questions are given in Figure 1. It is seen that the success in the answers to all questions in the second survey increased compared to the first survey. While less than 50% of the participants gave correct answers in seven questions in the first survey, less than 50% of the participants answered correctly in only three questions in the second survey. The increase in success in all questions indicates that the learning level is good.

Table 2. Occupational health and safety training topics and percentage distribution of questions in the questionnaires.

	Topics	Question distribution in the first survey	Question distribution in the second survey
General Subjects	*Information on labor legislation*	10%	10%
	Legal rights and responsibilities of employees	15%	15%
	Workplace cleanliness and order	15%	15%
	Legal consequences arising from work accident and occupational disease	-	-
Health Issues	*Causes of occupational diseases*	-	-
	Disease prevention principles and application of prevention techniques	-	-
	Biological and psychosocial risk factors	-	-
	First aid	-	-
	Harms of tobacco products and passive exposure	-	-
Technical issues	*Chemical, physical and ergonomic risk factors*	5%	5%
	Manual lifting and transport	-	-
	Flash, explosion, fire and fire protection	-	-
	Safe use of work equipment		
	Working with display screen equipment	-	-
	Electrical hazards, risks and precautions	25%	25%
	Causes of work accidents and the application of protection principles and techniques	10%	10%
	Safety and health signs	-	-
	Use of personal protective equipment	5%	5%
	Occupational health and safety general rules and safety culture	15%	15%
	Evacuation and recovery	-	-

2.1.1. Evaluation of the survey results according to the gender and age groups of the participants

Approximately 70% of the participants are male and 30% are female. In Figure 2, the success status of the participants on the basis of gender is given, and it is seen that the level of knowledge of all participants increased by approximately 31% in the second survey. On the other hand, it can be said that the increase in success of male employees at the end of the second survey is higher than that of females. However, since the majority of female employees are administrative workers, it is clear that lower achievements would be expected. Therefore, it can be said that it would not be correct to evaluate success on the basis of gender.

Figure 3 shows the evaluation of the questionnaires according to age groups. In general, it was determined that success in the second survey increased significantly in all age groups. However, in the second survey, it can be said that the success in all age groups was around 80% and the success reached saturation at this level. For example, while the average success rate of the 21-30 age group was around 60% in the first survey, it increased to 80% in the second survey. Similarly, while the average success rate of the 41-50 age group was around 45% in the first survey, it reached 75% in the second survey. From this, it is clearly seen that it is possible to increase the level of knowledge significantly with education, regardless of age group, even if the initial knowledge level of employees about occupational health and safety principles is low.

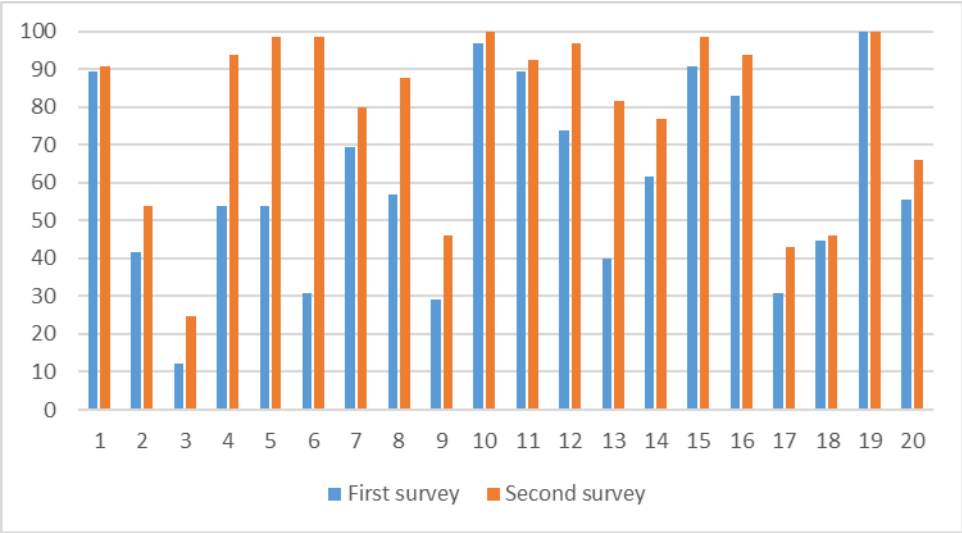

Figure 1. Analysis of the questions in the first and second questionnaires

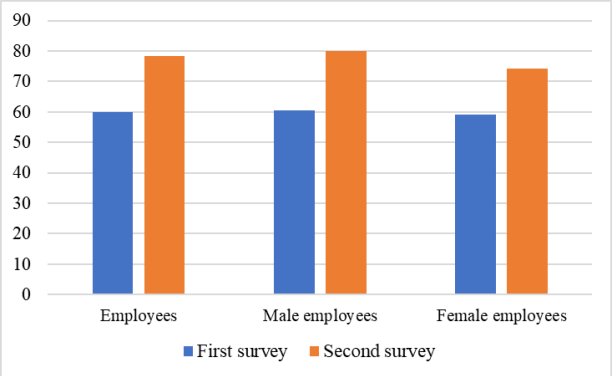

Figure 2. Average achievement status of the respondents

3. Results and Discussion

Whether the difference between the results of the questionnaire applied before and after the OHS training was statistically significant was questioned by t-test analysis in dependent groups. First of all, two hypotheses were determined for the test.

1. H0: The 2nd survey result is the same as the 1st survey result

2. H1: The 2nd survey result is different from the 1st survey result

Average of differences :$\bar{D}$=-18,38

Standard deviation of the differences : σ =12,41

Standard error of differences :$\bar{\sigma}$=1,54

Test statistic (taccount) :t_account=-11,91

Since the α error level was 5% and the number of volunteer participants was 65, the degree of freedom was determined as 64. As a result of statistical calculations;

According to these results, the t value was found to be 2.0. Since the t value found is greater than the calculated t value, the H0 hypothesis was rejected (|-11.91|> 2.0). According to the H1 hypothesis, the two identical samples are different.

In the normalized graph in Figure 2., it is seen that most of the participants got scores below 70 before the occupational health and safety training, whereas the majority of the participants got 70 points and above as a result of the questionnaire applied after the training. These results show that the training has a positive effect on the employees.

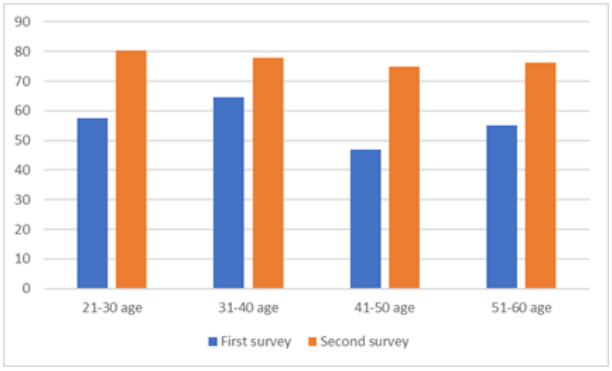

Figure 3. Success in surveys by age groups

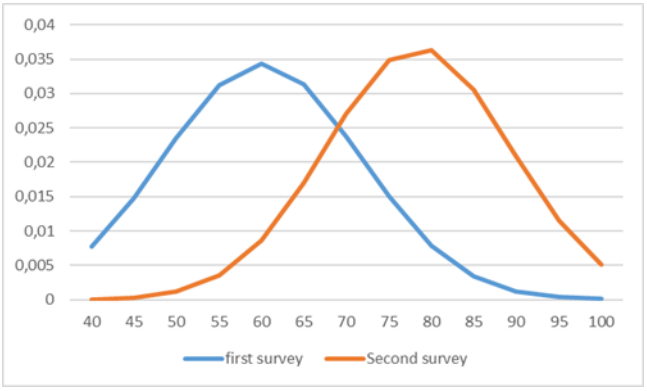

Figure 4. Normalized Survey Graph

4. Conclusions and Recommendations

As in the world, the importance and sensitivity of occupational health and safety information is increasing day by day in Turkey. Occupational Health and Safety Law No. 6331 regulates the duties, authorities, responsibilities, rights and obligations of employers and employees in order to ensure occupational health and safety at workplaces and to improve existing health and safety conditions. The employer is obliged to ensure the occupational health and safety of the employees. The employer is responsible for taking all kinds of precautions, including preventing occupational risks, providing training and information. Although employers have to comply with existing laws and regulations, they are also responsible for following new regulations and laws and making updates in line with new situations.

In Figure 1, it is seen that the answers given by the employees to the questions in the second questionnaire increased in almost all questions, in Figure 2, the success of almost all of the employees increased after the training, and in Figure 3, the success increased in all age groups. In line with these results, it has been proven that the first two levels of occupational safety training are successful according to the Kircpatrick four-level program evaluation model. On the other hand, the behavior level in the Kirkpatrick model is a stage in which the evaluation is made about whether the training changes the job performance, and at the results level, the qualitative and quantitative increase in the job is evaluated. It would be appropriate to examine these stages in detail.

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