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Evaluation of Factors Affecting the Knowledge Level of First Aid and Basic Life Support in Hazardous Workplaces

Tehlikeli İş Yerlerinde İlk Yardım ve Temel Yaşam Desteği Bilgi Düzeyini Etkileyen Faktörlerin Değerlendirilmesi

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ÖZ

Amaç: Bu araştırmanın amacı, çok tehlikeli ve az tehlikeli işyerlerinde çalışan işçilerin ilk yardım ve temel yaşam desteği bilgi düzeyini etkileyen faktörleri değerlendirmektir.
Araçlar ve Yöntem: Araştırma, Van Yüzüncü Yıl Üniversitesi Aile Hekimliği Anabilim Dalı'nda Ocak 2020 ile Ekim 2020 tarihleri arasında yapılmıştır. 18-65 yaş arası, çok tehlikeli veya daha az tehlikeli bir işte sigortalı olan ve çalışmaya katılmayı kabul eden kişiler çalışma dahil edildi. İki bölümden oluşan bir anket uygulandı, ilk bölüm sosyodemografik ve mesleki özellikleri topladı, ikinci bölüm ilk yardım ve temel yaşam desteği (20 madde) ile ilgili bilgi düzeyini değerlendirdi.
Bulgular: Araştırma bulgularına göre, çok tehlikeli iş yerinde çalışma oranları incelendiğinde, orta yaş ($p<0.001$) evli ($p<0.001$), ilkokul mezunu olanlarda ($p<0.001$) ve erkeklerde ($p<0.001$) anlamlı derecede daha yüksekti. Çok tehlikeli iş yerlerinde ilk yardım ve temel yaşam desteği eğitimi alma sıklığı daha düşüktü ($p=0.011$). Eğitim düzeyi yüksek olanlarda ($p<0.001$), ilk yardım ve temel yaşam desteği eğitimi alanlarda ($p<0.001$) bilgi düzeyi daha yüksekti. Çok tehlikeli iş yerlerinde çalışan işçilerde, eğitim alma durumu ($p=0.011$) ve bilgi düzeyinin ($p<0.001$) anlamlı derecede düşük olduğu belirlendi.
Sonuç: Lise ve üniversite mezunları, ilk yardım ve temel yaşam desteği eğitimi alanlar ve daha az tehlikeli iş yerlerinde çalışanlar ilk yardım ve temel yaşam desteği bilgi düzeyleri daha yüksektir. Bunlar, özellikle çok tehlikeli işyerlerinde tekrarlanan eğitim ihtiyacına işaret etmektedir.

Anahtar Kelimeler: ilk yardım; iş sağlığı, sağlık eğitimi; temel yaşam desteği

ABSTRACT

Purpose: The aim of this research was to evaluate factors affecting the knowledge level of first aid & basic life support (FA&BLS) among workers employed in 'very hazardous' and 'less hazardous' workplaces.
Materials and Methods: This research was carried out in Van Yüzüncü Yıl University, Department of Family Medicine, between January 2020 and October 2020. Persons between the ages of 18–65 who were insured in a very hazardous or less hazardous job and agreed to participate in the study were included. A two-part questionnaire was applied, the first part collected sociodemographic and occupational characteristics, the second part evaluated the level of knowledge concerning FA&BLS (20 items).
Results: According to the findings of the study, when the rates of working in very dangerous workplace were examined, the rates were significantly higher in middle-aged ($p<0.001$) married ($p<0.001$), primary school graduates ($p<0.001$) and male participants ($p<0.001$). The frequency of having received FA&BLS was lower in very hazardous workplaces ($p=0.011$). The level of knowledge FA&BLS was higher in those with higher education ($p<0.001$) and those who received FA&BLS training ($p<0.001$). It was determined that the frequency of having received training ($p=0.011$) and the level of knowledge ($p<0.001$) were significantly lower among workers employed in very hazardous workplaces.
Conclusions: The level of knowledge of FA&BLS is higher in those with high school and university degrees, those with FA&BLS training and those who work in less hazardous workplaces. These indicate the need for repeated training particularly in very hazardous workplaces.

Keywords: basic life support; first aid; health education; occupational health

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INTRODUCTION

Occupational health and safety practices that ensure the continuity of social, mental, and physical well-being of the employees require a joint effort from employees as well as occupational health and safety personnel.[1] Within the scope of occupational health and safety services, which include first aid administration, workers' quality of life is increased by providing a health service consisting of simple, preventive, and remedial interventions.[2]

In non-hospital settings such as the workplace, survivors of traumatic injury often require life-saving and time-critical interventions, such as maintaining a free airway or controlling bleeding, before the arrival of the emergency team.[3] First aid is defined as drug-free interventions with existing equipment that are administered at the scene of the accident / injury in order to either preserve life or prevent worsening of status until professional aid from health officials can be obtained.[4,5]

Early recognition of cardiac dysfunction and prompt initiation of basic life support practices by trained personnel are vital.[5] Having a high cardiopulmonary resuscitation knowledge score ensures a positive approach to performing cardiopulmonary resuscitation (CPR).[6] First aid must be taught correctly across a wide spectrum of individuals in the community, workplace and health care settings so that the first aid provider has the knowledge, skills and confidence to respond to an emergency and improve outcomes.[7,8] There is no globally-accepted standard procedure for first aid training and organization in workplaces. Developing and using effective workplace first aid systems can reduce mortality and morbidity resulting from incidents requiring first aid practice in the workplace.[3,7,9] The outcomes of occupational injuries include various forms of morbidity and may also lead to mortality; thus, appropriate administration of first aid can differentiate between life or death, rapid or delayed recovery, and temporary or permanent disability. First aid training in workplaces is given in direct proportion to the extent of risks and hazards related to occupational health and safety.[10] According to the hazard level of the workplace, employers are legally obligated to provide the minimum required first aid training to all personnel.[4]

In this study, we aimed to determine factors affecting the first aid and basic life support knowledge level of employees in workplaces categorized with different hazard levels.

MATERIALS and METHODS

Study Design and Ethics

This cross-sectional study was carried out at Van Yüzüncü Yıl University, Department of Family Medicine, between January 2020 and October 2020. Approval for this study was received from Van Yüzüncü Yıl University Non-Interventional Research Ethics Committee (dated 22.05.2020 and numbered 2020/03-04), was obtained to carry out the study. After giving detailed information about the purpose and scope of the research to the individuals who could be included in the research group, written and verbal consent was obtained from those who agreed to participate.

Definition of Workplace Hazard Level in Turkey

In the Occupational Health and Safety Law #6331, hazard is defined as the potential for harm or damage that exists in the workplace or may come from the outside which may affect the employee or the workplace. The hazard class for each workplace is determined by taking into account the characteristics of the work, the materials used or emerging at every stage of the work, equipment, production methods and forms, working environment and conditions, and in direct relation with the actual work done in that workplace.[11,12] Workplace hazard class is also associated with the opinions of the commission formed by the relevant parties under the guidance of the Presidency of the General Manager of Occupational Health and Safety, with respect to the premium tariff for short-term insurance branches determined in accordance with Article 83 of the Social Insurance and General Health Insurance Law #5510 of May 31, 2006. As a result, workplaces are classified into three major hazard groups: ‘less hazardous’, ‘hazardous’ and ‘very hazardous’. In the present study, subjects who were defined to be in ‘very hazardous’ workplaces and those in ‘less hazardous’ workplaces were examined.

Study Groups

A total of 503 people, including 248 workers working in very hazardous workplaces and 255 workers working in less hazardous workplaces, constituted the research group. The criteria for inclusion in the study were to be insured in a very hazardous or less hazardous job, to be between the ages of 18–65, and to agree to participate in the study. Individuals who did not meet the inclusion criteria and worked in a health institution were not included in the study.

Data Acquisition

The questionnaire form, which was created after a detailed literature review on the subject, consisted of two parts. In the first part, there were questions about the sociodemographic and occupational characteristics of the individuals. In the second part, there were questions evaluating the level of knowledge about first aid and basic life support. In order to evaluate knowledge concerning first aid and basic life support, a total of 20 items were created after relevant sources in the literature were examined in detail. Each item's responses comprised of four options, one of which was the correct answer. Each correct answer was scored with 1 point and incorrect answers were evaluated as 0 points. The questionnaire form was provided to participants and were filled individually. This process took approximately 30 minutes.

Statistical Analysis

All analyses were performed on IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, NY, USA), and results were evaluated with respect to a statistical significance threshold of $p<0.05$. The Shapiro-Wilk test was used to determine whether continuous variables were normally distributed. Data are given as mean±standard deviation or median (1st quartile-3rd quartile) for continuous variables according to normality of distribution, and as frequency (percentage) for categorical variables. Comparison of non-normally distributed variables were performed with the Mann-Whitney U test or the Kruskal Wallis test, depending on the number of groups being compared. Pairwise comparisons were performed with the Bonferroni correction method. Categorical variables were analyzed with chi-square tests. Spearman correlation coefficients were calculated to evaluate directional relationships between continuous variables.

RESULTS

There were 503 people, 425 (84.5%) male and 78 (15.5%) female, in the study group and their mean age was 32.5±8.3 years. The median age of very hazardous workplace workers was significantly higher ($p<0.001$). In very hazardous workplaces, the frequencies of males ($p<0.001$), married people ($p<0.001$) and primary school graduates ($p<0.001$) were higher compared to the less hazardous group. The frequency of those who received training on first aid and basic life support was significantly lower in very hazardous workplaces ($p=0.011$, Table 1).

According to knowledge level, the three questions that were respectively answered least correctly were: interventions for metal objects in the eye (32.6%), the 'ABC' of first aid (airway, breathing, and circulation) (34.2%) and the questions concerning basic life support in children (38.8%). Workers in less hazardous workplaces had significantly higher rates of correct response to the questions concerning the following topics: airway patency ($p=0.026$), the purpose of evaluating the scene of the accident ($p=0.016$), identification of most dangerous bleeding conditions requiring rapid intervention ($p=0.019$), assessment of short-term loss of consciousness ($p=0.005$), interventions for sprain injuries ($p=0.050$), tourniquet application ($p<0.001$), heart massage in children ($p<0.001$), and uncontrollable contractions in the body ($p=0.001$). In first aid, the frequency of correct answers to the questions about the first procedure to be performed on the patient ($p=0.024$) and the first person to be secured at the scene ($p=0.035$) was found to be higher in those working in very hazardous workplaces. The groups were similar in terms of answers to other questions (Table 2).

The median (1st quartile-3rd quartile) score obtained from the second part of the questionnaire was 12 (10-14) points. There was no correlation between the age of the workers and the knowledge level of first aid and basic life support in the study group ($r=-0.057$, $p=0.209$). The level of knowledge first aid and basic life support was higher in those with a higher education level ($p<0.001$) and those

who received training on first aid and basic life support (p<0.001). Knowledge level was found to be significantly lower among individuals working in very hazardous work-places (p<0.001). First aid and basic life support knowledge levels were not found to be associated with marital status (p=0.975), history of work accident (p=0.426) or duration of employment (p=0.301) (Table 3).

Table 1. Distribution of the study group according to basic characteristics.

Variables	VHW workers	LHW workers	Total	p
Age	33 (28-39.5)	30 (25-36)	32 (26-37)	<0.001
Sex				
Female	5 (2.0)	73 (28.6)	78 (15.5)	<0.001
Male	243 (98.0)	182 (71.4)	425 (84.5)	
Marital status				
Single	80 (32.3)	124 (48.6)	204 (40.6)	<0.001
Married	168 (67.7)	131 (51.4)	299 (59.4)	
Educational level				
Primary education	165 (66.5)	93 (36.5)	258 (51.3)	<0.001
High school	63 (25.4)	87 (34.1)	150 (29.8)	
University	20 (8.1)	75 (29.4)	95 (18.9)	
Work accident history				
Present	4 (1.6)	11 (4.3)	15 (3.0)	0.075
Absent	244 (98.4)	244 (95.7)	488 (97.0)	
Status of receiving first aid and basic life support training				
Present	163 (65.7)	194 (76.1)	357 (71.0)	0.011
Absent	85 (34.3)	61 (23.9)	146 (29.0)	

Data are given as median (1st quartile - 3rd quartile) for continuous variables and as frequency (percentage) for categorical variable.
VHW: Very hazardous workplace, LHW: Less hazardous workplace

Table 2. Frequency of correct answers given to first aid and basic life support knowledge level questions according to workplace hazard level.

Qustions of survey	VHW workers	LHW workers	Total	p
1. What is first aid?	210 (84.7)	226 (88.6)	436 (86.7)	0.192
2.What is the emergency notification phone number?	236 (95.2)	249 (97.6)	485 (96.4)	0.133
3. What is the a (airway) of a, b, c in basic life support?	73 (29.4)	99 (38.8)	172 (34.2)	0.026
4. What is the first action to be done to a sick or injured person in first aid?	117 (47.2)	95 (37.3)	212 (42.1)	0.024
5. What is the normal heart rate per minute for an adult?	157 (63.3)	152 (59.6)	309 (61.4)	0.394
6. Which of the following is not one of the purposes of crime scene evaluation?	170 (68.5)	199 (78.0)	369 (73.4)	0.016
7. Whose safety is ensured first at the crime scene?	198 (79.8)	183 (71.8)	381 (75.7)	0.035
8. For the purpose of saving life, after providing airway patency, what is it called to provide air to the lungs by artificial respiration and to pump blood again by heart massage to the person whose breathing or heart has stopped?	127 (51.2)	111 (43.5)	238 (47.3)	0.085
9. When is basic life support terminated in children?	105 (42.3)	90 (35.3)	195 (38.8)	0.105
10. What to do as first aid to someone who has a complete block-age of the trachea?	118 (47.6)	117 (45.9)	235 (46.7)	0.703
11. Which bleeding is the most dangerous and should be treated quickly?	206 (83.1)	230 (90.2)	436 (86.7)	0.019
12. Which of the following is one of the first aid principles for nosebleeds?	116 (46.8)	134 (52.5)	250 (49.7)	0.195
13. What is a short-term superficial temporary loss of conscious-ness called?	133 (53.6)	168 (65.9)	301 (59.8)	0.005
14. Which of the following is not one of the first aid principles for convulsions caused by fever?	200 (80.6)	214 (83.9)	414 (82.3)	0.336
15. Which of the following is not one of the first aid principles for low blood sugar?	172 (69.4)	159 (62.4)	331 (65.8)	0.098
16. Which of the following is not among the first aid applications for sprains?	101 (40.7)	126 (49.4)	227 (45.1)	0.050
17. Which of the following is incorrect in turnstile applications?	124 (50.0)	174 (68.2)	298 (59.2)	<0.001
18. How to do heart massage in children?	86 (34.7)	134 (52.5)	220 (43.7)	<0.001
19. What is done as first aid in case of metal object in the eye?	77 (31.0)	87 (34.1)	164 (32.6)	0.463
20. What is the name of the uncontrollable contractions in the body's muscle structure as a result of electrical discharges in the brain due to an irritation in the nervous system center?	92 (37.1)	131 (51.4)	223 (44.3)	0.001

Data are given as frequency (percentage) for categorical variable.
VHW: Very hazardous workplace, LHW: Less hazardous workplace

Table 3. Distribution of first aid and basic life support knowledge level according to examined variables.

Variables	First aid and basic life support knowledge level	p
Sex		
Female	12 (10-14)	0.348
Male	12 (10-14)	
Marital status		
Single	12 (10-14)	0.975
Married	12 (10-14)	
Educational level		
Primary education[a]	11 (10-13)	<0.001
High school[b]	13 (11-14)	
University[c]	14 (12-15)	
Work accident history		
Present	11 (9-15)	0.426
Absent	12 (10-14)	
Status of receiving first aid and basic life support training		
Present	12 (11-14)	<0.001
Absent	10.5 (8-13)	
Working time in the profession		
< 5 years	12 (10-14)	0.301
5-10 years	12 (10-14)	
>10 years	12 (9-14)	
Workplace hazard level		
Less hazardous workplace	13 (11-14)	<0.001
Very hazardous workplace	11 (10-13)	

Data are given as median (1st quartile - 3rd quartile).
a,b,c: Same letters denote the lack of statistically significant difference between groups.

DISCUSSION

Occupational accidents can occur at any time, and it is important for employees to implement first aid measures quickly and accurately, resulting in a potential reduction in the likelihood of serious injury, disability, hospital stay, costs and deaths associated with occupational accidents.[13,14,15] First aid and basic life support skills should be taught, and plans should be made to increase individuals' practical experience. Basic first aid training prepares the trained individual to respond to a wide range of events and provide immediate and effective treatment, including calling the emergency medical system, maintaining airway patency, and maintaining breathing and circulation.[8]

In this study, no correlation was found between the age of the workers and their knowledge level regarding first aid and basic life support. This clearly shows that it is necessary to carry out regular training regardless of employee experience at the workplace. Similarly, in other studies, it was reported that the level of basic life support knowledge did not change according to age.[16,17] In fact, the study by Çelik et al. reported that there was a weak negative correlation between the first aid knowledge level and the age of workers before first aid training and a strong negative correlation after the training, further demonstrating that older employees may acquire less knowledge compared to younger workers even when training is applied.[18] There are other studies showing that younger age groups have higher knowledge of first aid and basic life support.[19,20] However, interestingly, a study among teachers reported that older age was associated with greater likelihood of appropriate first aid practice.[21] This particular relationship, when taken together with the relatively lower education levels in our study, may indicate that baseline education level among workers is critically associated with the success of training. Therefore, it was thought that the differences concerning age and education levels of individuals included in our research groups might cause differences in the results.

In a study conducted with industrial workers, it was reported that there was no significant relationship between first aid application score and sex, similar to our findings.[1] In some previous studies, it was reported that the knowledge level concerning first aid and basic life support was higher in males.[16,19,20] The higher prevalence of male workers in very hazardous workplaces in our research group may have caused this result. On the other hand, possible social differences in factors such as women's working life and participation in society and education levels among the groups may have caused the aforementioned differences.

It is reported that first aid training with augmented reality that utilizes audiovisual cues and instructions for accident scenarios, allow employees to apply first aid measures in a timely and accurate manner.[13] These experience-based training methods are expected to increase workers' awareness and knowledge about first aid practices. In the study of Uruk and Erdoğan, it was reported that the frequency of correctly answering questions concerning survival and

first aid was higher among those who had first-hand experience of previous work accident(s) compared to those without such a history.[17] In this study, no relationship was found between work accident history and the knowledge levels regarding first aid and basic life support.

The level of knowledge concerning first aid and basic life support may be expected to be higher among those who have been employed for longer periods, since they are much more likely to have undergone compulsory or non-compulsory first aid training.[4] However, in the present study, no relationship was found between total working time of the workers and their knowledge level. Similarly, in other previous studies, it was reported that no significant relationship was found between the total first aid application score of the workers and their years of experience in the profession.[1,17] This finding again underlines the importance of providing regular training for workers.

It is possible that the higher level of knowledge among workers with a high level of education is associated with their greater ability to understand and interpret the content presented in the formal education concerning first aid and basic life support. Consistent with the results reported in previous studies, we found that those with higher education levels had higher knowledge of first aid and basic life support.[8,16,19] However, although rare, there are also results stating no relationship between education level and first aid knowledge.[17]

First aid training complements traditional occupational health and safety training programs by increasing motivation to avoid occupational injury and illness and improving risk control behaviors.[22] Staff training in first aid is essential, as survival after injury in the workplace is highly dependent on the provision of immediate and correct first aid measures.[13,22] Employees in the workplace have been demonstrated to be willing to receive training on first aid and to repeat this training.[23,24] In a prospective study, it was reported that 35% of the group had received training, and people with documented first aid training practiced better-quality first aid.[3] In another study, it was reported that 61.9% of the participants had previously received first aid training.[24] According to many previously reported results, first aid and basic life support training increases the knowledge level of workers. [1, 8, 18-20, 25-29] In the current study, 71.0% of the study group had received training in first aid and basic life support. In addition, it was determined that the knowledge scores of the workers who had received first aid and basic life support training were significantly higher, supporting prior literature. In a workplace study, it was reported that those who renewed their first aid knowledge certificate one or more times outperformed those who received training only once.[8] In a study by Anderson et al. utilizing a workplace injury scenario, it was reported that although most assessment skills related to cardiopulmonary resuscitation improved in people who had been re-certified one or more times, these abilities still worsened over time. Skill-based components such as locating and controlling the airway for chest compressions have been reported to decrease more predictably. It has been reported that the time elapsed since the last training was negatively correlated with the number of safety checks before cardiopulmonary resuscitation and the number of periodic checks for airway and position.[30] In some other studies in which training interventions were carried out, it was reported that the level of knowledge decreased after training.[31,32] Even among health professionals, there may be a decline in skills when up-to-date information is not reinstated, and many first aid skills deteriorate to unacceptable levels after a certain period of time.[8] In this study, due to the cross-sectional nature of the research, the trend of change over time in the knowledge level of first aid and basic life support could not be evaluated. Our results regarding the frequency of first aid and basic life support training among workers in the workgroup are encouraging, but these can still be improved, especially considering the lower scores among workers in very hazardous workplaces. Educational studies on first aid and basic life support should be planned and subjects with relatively lower scores should be emphasized. For instance, in the present study the three questions that were answered least correctly were about the following topics: intervention for penetrating eye trauma (32.6%), the 'ABC' of first aid (34.2%) and basic life support in children (38.8%). Together with results that reveal the trend of change in knowledge levels over time, it is evident that it will be beneficial to provide periodic training in order to ensure workers remain proficient in first aid.

It is recommended that first aid training practice should be proportionate to the extent of occupational health and safety risks in the workplace. Therefore, the greater the risk in the workplace environment, the greater the number of required persons trained in first aid.[10] In Turkey, according to the nature of the work, workplaces are divided into 3 levels of danger as less hazardous, hazardous, and very hazardous. According to the First Aid Regulation (Article #19) published by the Ministry of Health, it is obligatory to have at least one first aid-trained individual for every 20 employees in less hazardous workplaces, one first aid-trained individual for every 15 employees in hazardous workplaces, and one first aid-trained individual for every 10 employees in very hazardous workplaces.[4] In the current study, it was determined that the frequency of those who received first aid and basic life support training in very hazardous workplaces was lower and their level of knowledge was found to be significantly lower. The result related to the knowledge level of first aid and basic life support, which indicated lower scores among those in very hazardous workplaces (despite higher risks), may be due to the lower education level and the lower frequency of first aid training in very hazardous workplaces. Therefore, it is evident that it will be beneficial to increase efforts to encourage formal education in all workplaces, especially in very hazardous workplaces, and to ensure that first aid and basic life support training is repeated in areas where there are greater deficiencies (the 'ABC' of first aid, evaluation of the scene, the most hazardous type of bleeding that requires rapid intervention, etc.). However, it may also be beneficial to define these deficiencies in each workplace in order to identify specific training targets for each workplace.

Limitations

One of the most important limitations of the study is that it employs a cross-sectional design and is not population-based or prospective. The differences between the content and duration of the first aid and basic life support training, the experience of the trainer, and the quality of the training are important factors that could not be evaluated in the study and may have affected results. Because the answers given to the questions were recorded through obtaining the statements of the individuals, recall bias may have arisen. The results of the study should be interpreted with these limitations in mind.

As a result, knowledge of first aid and basic life support was higher in those with higher education levels, those who received first aid and basic life support training, and those working in less hazardous workplaces. In order to ensure occupational health and safety in the workplace, it may be beneficial to conduct training studies on first aid and basic life support, especially in very hazardous workplaces. There is a need for more comprehensive and prospective studies exploring the factors affecting the knowledge level of first aid and basic life support in the field of occupational health.

Conflict of Interest

The authors declare that there is not any conflict of interest regarding the publication of this manuscript.

Ethics Committee Permission

Approval for this study was received from Van Yüzüncü Yıl University Non-Interventional Research Ethics Committee (dated 22.05.2020 and numbered 2020/03-04).

Authors' Contributions

Concept/Design: AY. Data Collection and/or Processing: AY. Data analysis and interpretation: AY. Literature Search: AY. Drafting manuscript: AY. Critical revision of manuscript: HAŞ. Supervisor: HAŞ.

REFERENCES

1. Abd El-Kareem Al-Kady H, Sadek AbdEl-Hameed H., Abd El-Ali EM, Sabry SS. Safety measures and first aid practices among oil and soap workers. J. Nurs. Sci. Benha Univ. 2022;3(1):791-803.
2. Loeppke R, Heron R, Bazas T, et al. Global trends in occupational medicine. Occup Environ Med. 2017; 59(3):e13-e16.
3. Bakke HK, Steinvik T, Eidissen S, et al. Bystander first aid in trauma–prevalence and quality: a prospective observational study. Acta Anaesthesiol. Scand. 2015;59(9):1187-1193.
4. Türkiye Sağlık Bakalığı, İlkyardım Yönetmeliği: https://www.resmigazete.gov.tr/eskiler. 2015/07/20150729-2.htm. Access date 18 September, 2022.
5. Soar J, Nolan JP, Böttiger BW, et al. European resuscitation council guidelines for resuscitation 2015: Section 3. Adult advanced life support. Resuscitation. 2015;95(1):100-147.

6. Riccò M, Berrone M, Vezzosi L, et al. Factors influencing the willingness to perform bystander cardiopulmonary resuscitation on the workplace: a study from North-Eastern Italy. Acta Biomed. 2020;91(4): 2020180.
7. Pek JH. Guidelines for bystander first aid 2016. Singapore Med J. 2017;58(7):411-417.
8. Anderson GS, Gaetz M, Masse J. First aid skill retention of first responders within the workplace. Scand. J. Trauma, Resusc. Emerg. Med. 2011;19(1):1-6.
9. Dagrenat C, Cassan P, Issard D, et al. Secourisme sur le lieu de travail dans le monde : revue systématique de la littérature. Arch. Mal. Prof. Environ. 2015;76(6): 568-578.
10. Lingard H. The effect of first aid training on Australian construction workers' occupational health and safety motivation and risk control behavior. J. Saf. Res. 2002; 33(2):209-230.
11. Sosyal Sigortalar ve Genel Sağlık Sigortası Kanunu: https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=5510&MevzuatTur=1&MevzuatTertip=5. Access date 29 January, 2023.
12. İş Sağlığı ve Güvenliği Kanunu. https://www.mevzuat.gov.tr/mevzuatmetin/1.5.6331.pdf. Access date 29 January, 2023.
13. Fromm J, Mirbabaie M, Stieglitz S, The Potential of Augmented Reality for Improving Occupational First Aid. In Proceedings of the 14th International Conference on Wirtschaftsinformatik (WI), Siegen, Germany. 2019;13(2):1569-1579.
14. Tannvik T, Bakke H, Wisborg T. A systematic literature review on first aid provided by laypeople to trauma victims. Acta Anaesthesiol. Scand. 2012;56 (10):1222-1227.
15. Leonard LG, Scheulen JJ, Munster AM. Chemical burns: effect of prompt first aid. J Trauma. 1982;22(5): 420-423.
16. Aldhakhri A, Can G. Evaluation of public awareness, knowledge and attitudes towards basic life support among non-medical. Adult population in Muscat City, Oman: Cross-Sectional Study. medRxiv. 2020; 2020:05.
17. Gülse M, Erdoğan Ö. Yer altı maden işçilerinin afet anında hayatta kalma ve ilk yardım bilgi düzeyleri. Resilience. 2022;6(1):1-13.
18. Celik B, Ozturk D, Yapar N, et al. Evaluation of the effectiveness of first aid training in shopping center employees. Наука и здравоохранение. 2019;1:58-62.
19. Mekonnen CK, Muhye AB. Basic life support knowledge and its associated factors among a non-medical population in Gondar town, Ethiopia. Open Access Emerg. Med. 2020;1(2):323.
20. Lam NN, Tuan CA, Huong HTX. To evaluate first aid knowledge on burns management amongst high rısk groups. Burns Open. 2017;1(1):29-32.
21. Başer M, Çoban S, Taşci S, Sungur G, Bayat M. Evaluating first-aid knowledge and attitudes of a sample of Turkish primary school teachers. J Emerg Nurs. 2007;33(5):428-432.
22. Lingard H. The effect of first aid training on Australian construction workers' occupational health and safety motivation and risk control behavior. J Safety Res. 2002;33(2):209-230.
23. Kim HH, Lee IS. First aid knowledge and education needs of ski resort workers. Korean J Emerg Med Ser. 2012;16(1):103-115.
24. Yurumez Y, Yavuz Y, Saglam H, Köken R, Tunay K. Evaluation of the level of knowledge of first aid and basic life support of the educators working in preschools. Acad Emerg Med. 2007;5(3):17-20.
25. Aytaç Ş, Gök MG, Özkan S. Bir işçi sağlığı ve güvenliği uygulaması olan temel ilk yardım eğitiminin incelenmesi. Gazi Med. J. 2016;27(2).
26. Hatzakis KD, Kritsıtakis EI, Angelaki HP, et al, First aid knowledge among ındustry workers in Greece. Ind. Health. 2005;43(2):327-332.
27. El-Ghany GM, Mahmoud SF. Effect of educational intervention about first aid and ergonomics on improving bakery workers' performance related to occupational hazards at Zagazig City. Egypt. Nurs. J. 2019; 16(1):10.
28. AI-Sallami TY, Khudair FW. Workers knowledge about first aids of emergency accidents at ındustrial sector of al-najaf city in Iraq. Indian J. Forensic Med. Toxicol. 2022;16(1):865-871.
29. Witkowski G, Padala O, Dzikowski W, et al. In situ simulation training in first aid. pilot study. First aid in a dangerous workplace. J. Educ. Health Sport. 2017; 7(4):435-446.
30. Anderson GS, Gaetz M, Statz C. CPR skill retention of first aid attendants within the workplace. Prehosp Disaster Med. 2012;27(4):312-318.
31. Nour-Eldien M, Sadek AEH, Mohamed SED. Safety measure and first aid program among workers in delta fertilizer and chemical company regarding occupational health hazards. J. Nurs. Sci. 2022;3(1):610-624.
32. Olumide AO, Asuzu MC, Kale OO. Effect of first aid education on first aid knowledge and skills of commercial drivers in South West Nigeria. Prehosp Disaster Med. 2015;30(6):579-585.