

The impact of basic first aid training on knowledge levels of school-aged children

Okul çağı çocuklarına verilen temel ilk yardım eğitiminin bilgi düzeyine etkisi

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ABSTRACT

Aim: Children's increased physical activity and independence, coupled with their inability to take precautions, increases the risk of injury. Learning first aid is crucial in preventing deaths resulting from accidents or injuries, as well as preventing the worsening of the patient's condition and facilitating recovery. This study was conducted to determine the impact of basic first aid training on knowledge levels of school-aged children. **Material and Method:** This quasi-experimental study was conducted with 265 students in the 5th grade of four secondary schools in İstanbul. Data were collected using the "Information Form" and "Knowledge Assessment Form for First Aid Training". Students received 90 minutes of instruction as part of their basic first aid training. Data were collected face-to-face before and one-month after the training. **Results:** The average age of the students was 10.17±0.45 years and 57.4% (n=152) were female. The students' mean first aid knowledge scores before and after the training were 63.94±5.35, 92.67±9.70, respectively, and there was a statistically significant difference between them (p<0.05). While the age did not affect the average first aid knowledge scores, it was determined that the gender variable did. **Conclusion:** It was determined that the basic first aid training given to 5th grade school students increased the students' first aid knowledge levels. The skills learned in childhood through school-based first aid continue into adulthood. Thus, teaching first aid skills to children at a young age is a crucial step in promoting a more aware society in the future.

ÖZ

Giriş ve Amaç: Çocukların fiziksel aktivitelerinin ve bağımsızlıklarının artması ve önlem almada yetersiz olmaları yaralanma riskinin artmasına neden olmaktadır. Kaza/yaralanma sonucu ölümlerin ve hasta/yaralının durumunun kötüleşmesinin önlenmesi ve iyileşmenin kolaylaştırılması için ilkyardım uygulamalarının öğrenilmesi ve uygulanması çok önemlidir. Bu araştırmanın amacı okul çağındaki çocuklara verilen temel ilkyardım eğitiminin öğrencilerin temel ilkyardım bilgi düzeyi üzerine etkisinin belirlenmesidir. **Gereç ve Yöntem:** Yarı deneysel tipteki bu araştırma İstanbul ili Ümraniye İlçesine bağlı dört devlet ortaokulunun 5. sınıflarında öğrenim gören 265 öğrenci ile gerçekleştirilmiştir. Veriler Tanıtıcı Bilgi Formu ve İlk Yardım Eğitimi Bilgi Değerlendirme Formu ile toplanmıştır. Temel ilkyardım eğitimi kapsamında öğrencilere iki ders saati (90dk) eğitim verilmiştir. Veriler eğitim öncesi ve eğitimden bir ay sonra yüz yüze toplanmıştır. **Bulgular:** Öğrencilerin yaş ortalaması 10.17±0.45 ve %57,4 (n=152)'ü kız öğrencidir. Öğrencilerin eğitim öncesi ve sonrası ilkyardım bilgisi puan ortalamaları sırasıyla 63.94±5.35, 92.67±9.70 olduğu ve aralarında istatistiksel olarak anlamlı farklılık olduğu belirlenmiştir (p<0.05). Yaş değişkeninin ilkyardım bilgisi puan ortalamalarını etkilemediği, cinsiyet değişkeninin ise etkilediği belirlenmiştir (p<0.05). **Sonuç:** Araştırma sonucunda ortaokul 5. sınıf öğrencilerine verilen temel ilk yardım eğitiminin öğrencilerin ilkyardım bilgi düzeylerini arttırdığı belirlenmiştir. Okullarda çocukluk döneminde ilk yardım eğitimleri ile kazandırılan beceriler yetişkinlik döneminde de devam ettiğinden, çocuklara erken dönemde ilk yardım becerileri kazandırmak gelecek yıllarda daha bilinçli bir toplum oluşturmak için önemli bir adımdır.

INTRODUCTION

Accidents are a significant health concern according to the World Health Organization. They increase mortality and morbidity, cause loss of labor and economic losses, and reduce the quality of life (World Health Organization ?WHO?, 2016; Akkan, 2018). Accidents are a leading cause of injuries and deaths among school-age children worldwide, resulting in hundreds of thousands of

casualties each year. Every year, between 10% and 25% of the injuries related to accidents that affect over 14 million children aged 14 and under occur in or around schools (Reveruzzi et al., 2016). In Turkey, the death rate due to injuries sustained by children at home, at school, or during sports or leisure activities is reported to be 9.77% (European Injury Database ?EuroSafe?, 2016). During this period, children's increased physical

activity and independence and their inability to take precautions increase the risk of injury. Accidents can have a significant impact on the physical, psychological, and social health of children, and in some cases, can result in illness, disability, or even death. For this reason, childhood accidents are a public health problem that needs to be emphasized (Akçay and Yıldırımlar, 2018; Özsoy et al., 2019).

First aid is a non-pharmaceutical intervention performed on-site during accidents or life-threatening situations using available tools and equipment, without medical devices, to preserve life or prevent the situation from worsening until paramedics arrive (Turkish Ministry of Health, 2015). Approximately 50 percent of all fatalities occur in the first 30 minutes after an accident or injury has occurred. Considering that approximately 5.1 million people in the world and 250 thousand people in Europe die due to accidents and injuries every year, the importance of first aid practices is more understood (Eurosafte, 2019).

Every year in Turkey, many individuals either lose their lives or become disabled due to accidents, diseases, and disasters that occur at home, work, school, or on the road. Since there will not always be a paramedic at the scene in the early period after any accident/incident, the first aid practices that people in the environment or those affected by the event will do to themselves or others are extremely important (Dieljtens et al., 2013). First aid practices are crucial for preventing death and deterioration of health status with simple interventions. Therefore, students need to know basic first aid practices (Akçay and Yıldırımlar, 2018). In the event of injuries resulting from a school accident, the child is expected to remain calm and administer first aid to their injured friend. They should also report the situation to emergency medical personnel and teachers (Akkan, 2018).

Providing education to school-age children enables them to learn more quickly and be more motivated than adults. First aid education in schools not only teaches students good health habits but also helps them transfer correct health behaviors and knowledge to their families and indirectly to society (Bulduk, 2017; Akkan, 2018; Özsoy et al., 2019; Aksu, 2020). Especially during middle school, children begin to develop abstract thinking skills, allowing them to view their environment from multiple perspectives. Additionally, formal and logical thinking abilities are also developed during this time. Therefore, this is the time when they will be successful in learning the knowledge and practices of first aid (Uray et al., 2003). First aid and health education programs developed during school years can reduce the incidence of adverse events, such as life-threatening accidents

(Bulduk, 2017). However, the creation of an effective training plan is just as important as the delivery of the training itself (Akkan, 2018). Studies have reported that the first aid knowledge and skill levels of school-age children are insufficient, despite the inclusion of basic first aid knowledge in the education curriculum (Akçay and Yıldırımlar, 2018; Aksu, 2020; Düdükçü et al., 2022). Therefore, first aid training should be provided to school-age children. In this context, this study was conducted to determine the impact of basic first aid training on knowledge levels of school-aged children.

MATERIAL AND METHOD

This quasi-experimental, pretest and posttest single group study was conducted between 02 October 2023 – 29 December 2023 in four secondary schools located in Ümraniye/İstanbul. The cooperation protocol between the university and the Directorate of National Education (Ümraniye), along with the support of the school administrations, was instrumental in selecting the schools for the research. The population of the research consisted of 5th grade students of the secondary schools where the research was conducted. The study included sections of classes that were recommended by the school's administration. The research sample consisted of students who attended the specified classes and whose parents consented to participate in the study, received face-to-face instruction, and completed the questionnaires in full. The research was conducted with 265 students in nine classes in total in four secondary schools.

This research was carried out within the scope of the "Cooperation for Projects to be Realized to Protect and Improve Children's Health" protocol signed by Istanbul Medeniyet University, Ümraniye District Governorate and Ümraniye National Education Directorate. To carry out the project, necessary permissions were obtained from the University administration and Ümraniye Directorate of National Education. Before starting the research, parents were informed by the school administration. As part of the project activities, the researchers trained students in basic first aid. Education Topics;

- General first aid information,
- Patient/injured/crime scene evaluation
- First aid for respiratory tract obstructions
- First aid for bleeding
- First aid for fractures, dislocations and sprains
- First aid for disorders of consciousness
- First aid for burns and frostbite

- First aid in case of poisoning
- First aid for animal bites/stings
- First aid for foreign objects in eyes, ears and nose

The trainings were conducted in a classroom and lasted for two hours. The 'First Aid Seminar for Children' PowerPoint presentation, prepared by Kızılay, was used. Necessary permission was obtained from Kızılay to use the presentation. A total of 18 hours of face-to-face training were provided within the scope of the project.

Data Collection

Data were collected face to face in a classroom. Informed consent was obtained from students' parents before completion of questionnaires and participation in training. Data were collected using the "Information Form" and "Knowledge Assessment Form for First Aid Training".

Information Form: The form developed by the researchers includes questions about the students' age, gender, grade and first aid training (Yalçın, 2010; Bulduk, 2017; Aksu, 2020).

Knowledge Assessment Form for First Aid Training: It was developed by Yalçın in 2010 to correspond to the cognitive goals expected to be acquired in first aid training, and its validity and reliability were tested. It consists of a total of 34 multiple-choice questions includes general first aid information (8 questions), characteristics of the first aider (1 question), human body (1 question), evaluation of the patient/injured person and the scene (9 questions), first aid in case of bleeding (5 questions), first aid in case of burns and frostbite (3 questions), first aid in case of fracture (2 questions), first aid in case of poisoning (3 questions), first aid in respiratory tract obstruction (2 questions). Each question is evaluated as "I don't know", "I know" or "misunderstood". The scoring system for the question is as follows: 'Correct' is worth 3 points, 'I don't know' is worth 2 points, and 'Wrong' is worth 1 point. The highest score from the scale is 102 and the lowest score is 34. The Cronbach's alpha of the original scale was 0.743. In this study, the Cronbach's alpha of the scale was found as 0.896.

Statistical Analysis

Data were evaluated in the SPSS 25.0 program (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.) Mean, standard deviation, frequency, percentage, minimum and maximum were used as descriptive statistical methods. The suitability of continuous variables for normal distribution was evaluated with the Kolmogorov-Smirnov test. For intergroup comparisons

of continuous variables, the Mann Whitney U test was used for two groups, while the Kruskal-Wallis test was used for multiple groups. T test was used in dependent groups to compare pre-test and post-test score averages. $p < 0.05$ level was considered statistically significant.

Ethical Consideration

This research was conducted in accordance with the principles stated in the Declaration of Helsinki. Ethics committee approval (Number: 2023/2300060012) was obtained from the university. The purpose and voluntary nature of the study were explained to participating students and their parents. Written consent was obtained from the parents.

RESULTS

The average age of the students was 10.17 ± 0.45 years and 57.4% ($n=152$) were female. Of the 251 students surveyed, 94.7% believed that receiving first aid training was necessary. When the distribution of the sources from which students want to receive first aid training is examined, 32.1% ($n = 85$) comes from healthcare professionals, 31.7% ($n = 84$) comes from teachers, 15.1% ($n = 40$) from family, 9.8% ($n=26$) from internet, 4.2% ($n=11$) from textbook, 2.3% ($n=6$) from TV/radio, and 1.5% ($n=4$) newspapers/journals (Table 1).

The distribution of the students' answers to the questions in the "Knowledge Assessment Form for First Aid Training" in the pre-test and post-test are shown in Table 2 and Table 3. The results indicate a significant increase in the rate of correct answers given by students in the post-test of the "Knowledge Assessment Form for First Aid Training" compared to the pre-test. The students' mean first aid knowledge scores before and after the training were 63.94 ± 5.35 and 92.67 ± 9.70 , respectively, and there was a statistically significant difference between them ($p < 0.05$). It was determined that the post-test total score of the "Knowledge Assessment Form for First Aid Training" was statistically significantly higher than the pre-test (Table 4). While the age did not affect the average first aid knowledge scores, it was determined that the gender variable did. The mean scores of female students are higher than those of male students, and the difference between them was determined to be statistically significant ($p < 0.05$) (Table 5).

DISCUSSION

This study was conducted to determine the impact of basic first aid training on knowledge levels of school-aged children. The majority of students aged 9-11 who participated in this study (94.7%) stated that it was necessary to receive training in first aid. When

Table 1. Descriptive Characteristics of Students (N=265)

Descriptive Characteristics		Mean	Standard Deviation
Age		10.17	0.45
		n	%
Age	9 years	8	3.0
	10 years	205	77.4
	11 years	52	19.6
Gender	Female	152	57.4
	Male	113	42.6
The necessity of receiving training in first aid	Yes	251	94.7
	No	14	5.3
Distribution of first aid training resources by student preference			
Healthcare professionals		85	32.1
Teachers		84	31.7
Family		40	15.1
Internet		26	9.8
Textbook		11	4.2
Others*		9	3.4
TV-radio		6	2.3
Newspapers/journals		4	1.5

* As other source of information, students answered "Kızılay".

Table 2. Pre-Test Evaluation of Students' First Aid Knowledge Levels (N=265)

Information Area	Wrong		Not know		Correct	
	n	%	n	%	n	%
1. Definition of first aid	42	15.8	38	14.3	185	69.8
2. The person who gives first aid	37	14.0	12	4.5	216	81.5
3. First aid priorities	137	51.7	37	14.0	91	34.3
4. What to do first at the scene of injury	192	72.5	44	16.6	29	10.9
5. Basic practices of first aid	140	52.8	80	30.2	45	17.0
6. Telephone number of the emergency service	28	10.6	19	7.2	218	82.3
7. Information to be given when calling the emergency service	167	63.0	43	16.2	55	20.8
8. Injured people who need priority intervention in case of accident	61	23.0	64	24.2	140	52.8
9. Characteristics of the first aider	169	63.8	85	32.1	11	4.2
10. Assessing vital signs	106	40.0	73	27.5	86	32.5
11. Correct order of first evaluation stages	83	31.3	134	50.6	48	18.1
12. Things to check for CAB evaluation	61	23.0	149	56.2	55	20.8
13. Ensuring airway patency (A)	102	38.5	151	57.0	12	4.5
14. In which case coma position will be given	74	27.9	156	58.9	35	13.2
15. Evaluation of the presence of breathing (B) in the first evaluation	70	26.4	156	58.9	39	14.7
16. Objectives of assessing the injured person	59	22.3	125	47.2	81	30.6
17. Evaluation of circulation (C) in the first evaluation	67	25.3	173	65.3	25	9.4
18. Situations where the head-chin position cannot be applied	100	37.7	137	51.7	28	10.6
19. Second evaluation rankings	58	21.9	157	59.2	50	18.9
20. The first thing to do to a patient with severe bleeding	88	33.2	83	31.3	94	35.5
21. First aid for nosebleed	97	36.6	103	38.9	65	24.5
22. First aid for internal bleeding	67	25.3	170	64.2	28	10.6
23. Signs of shock	72	27.2	124	46.8	69	26.0
24. Signs of internal bleeding	94	35.5	152	57.4	19	7.2
25. First aid for a person who is freezing in the cold	135	50.9	114	43.0	16	6.0
26. First aid to the victim during electric shock	74	27.9	106	40.0	85	32.1
27. First aid for burns	93	35.1	152	57.4	20	7.5
28. First aid practices in case of loss of movement, swelling or pain in the arm	65	24.5	138	52.1	62	23.4
29. Purpose of detecting fracture	100	37.7	142	53.6	23	8.7
30. First aid for digestive poisoning	91	34.3	154	58.1	20	7.5
31. First aid in respiratory poisoning	76	28.7	167	63.0	22	8.3
32. First aid for skin poisoning	82	30.9	166	62.6	17	6.4
33. First aid in case of foreign body in the airway (partial obstruction)	128	48.3	123	46.4	14	5.3
34. First aid in case of foreign body in the airway (total obstruction)	105	39.6	119	44.9	41	15.5

Table 3. Post-Test Evaluation of Students' First Aid Knowledge Levels (N=265)

Information Area	Wrong		Not know		Correct	
	n	%	n	%	n	%
1. Definition of first aid	5	1.9	0	0	260	98.1
2. The person who gives first aid	3	1.1	2	0.8	260	98.1
3. First aid priorities	7	2.6	3	1.1	255	96.2
4. What to do first at the scene of injury	16	6.0	2	0.8	247	93.2
5. Basic practices of first aid	14	5.3	4	1.5	247	93.2
6. Telephone number of the emergency service	2	0.8	2	0.8	261	98.5
7. Information to be given when calling the emergency service	17	6.4	7	2.6	241	90.9
8. Injured people who need priority intervention in case of accident	12	4.5	4	1.5	249	94.0
9. Characteristics of the first aider	23	8.7	4	1.5	238	89.8
10. Assessing vital signs	14	5.3	3	1.1	248	93.6
11. Correct order of first evaluation stages	16	6.0	3	1.1	246	92.8
12. Things to check for CAB evaluation	18	6.8	3	1.1	244	92.1
13. Ensuring airway patency (A)	24	9.1	5	1.9	236	89.1
14. In which case coma position will be given	29	10.9	13	4.9	223	84.2
15. Evaluation of the presence of breathing (B) in the first evaluation	28	10.6	10	3.8	227	85.7
16. Objectives of assessing the injured person	58	21.9	8	3.0	199	75
17. Evaluation of circulation (C) in the first evaluation	30	11.3	7	2.6	228	86.0
18. Situations where the head-chin position cannot be applied	24	9.1	6	2.3	235	88.7
19. Second evaluation rankings	29	10.9	7	2.6	229	86.4
20. The first thing to do to a patient with severe bleeding	27	10.2	7	2.6	231	87.2
21. First aid for nosebleed	21	7.9	6	2.3	238	89.8
22. First aid for internal bleeding	34	12.8	105	39.6	126	47.5
23. Signs of shock	119	44.9	7	2.6	139	52.5
24. Signs of internal bleeding	160	60.4	9	3.4	96	36.2
25. First aid for a person who is freezing in the cold	28	10.6	8	3.0	229	86.4
26. First aid to the victim during electric shock	16	6.0	7	2.6	242	91.3
27. First aid for burns	32	12.1	6	2.3	227	85.7
28. First aid practices in case of loss of movement, swelling or pain in the arm	20	7.5	14	5.3	231	87.2
29. Purpose of detecting fracture	0	0	9	3.4	256	96.6
30. First aid for digestive poisoning	27	10.2	10	3.8	228	86.0
31. First aid in respiratory poisoning	136	51.3	11	4.2	118	44.5
32. First aid for skin poisoning	27	10.2	10	3.8	228	86.0
33. First aid in case of foreign body in the airway (partial obstruction)	29	10.9	9	3.4	227	85.7
34. First aid in case of foreign body in the airway (total obstruction)	32	12.1	7	2.6	226	85.3

Table 4. Comparison of Pre-Test and Post-Test Results for Students' First Aid Knowledge Scores (N=265)

	Mean±SD	Min-Max	t	p
Pre-Test	63.94±5.35	48-78	-42.853	0.000*
Post-Test	92.67±9.70	57-102		

t= Dependent groups t-test; *p<0.05

Table 5. Comparison of Pre-Test and Post-Test First Aid Knowledge Scores According to Students' Descriptive Characteristics (N=265)

Characteristics	Pre-Test Mean±SD	Post-Test Mean±SD
Age	9 years	66.00±4.87
	10 years	63.59±5.40
	11 years	65.00±5.07
Test, p	KW=3.245	KW=0.123
	p=0.197	p=0.941
Gender	Female	64.16±5.22
	Male	63.64±5.53
Test, p	Z=-0.516	Z=-2.622
	p=0.606	p=0.009*

KW= Kruskal Wallis; Z=Mann Whitney U; *p<0.05

the distribution of the sources from which students want to receive first aid training is examined, it was determined that 32.1% (n = 85) want education from healthcare professionals, 31.7% (n = 84) want education from teachers. Similar to this result, Bulduk stated that 58.1% of the students and Yalçın stated that 78.6% of the students stated that they want to receive first aid training to be a healthcare professional (Yalçın, 2010; Bulduk, 2017). These results are significant because they show that students recognize the importance of receiving basic first aid training and are open to having a healthcare professional train them. Because students in this study group are at higher risk for accidents, it is important to provide basic first aid training to create a safer school environment, prevent potential accidents, and ensure timely and accurate first aid in the event of an injury.

The students' mean first aid knowledge scores before and after the training were 63.94 ± 5.35 and 92.67 ± 9.70 , respectively, and there was a statistically significant difference between them. The study revealed significant deficiencies in first aid knowledge prior to training, but there was a statistically significant increase in students' knowledge scores after receiving basic first aid training. This result indicates that the training provided was effective in increasing the students' basic first aid knowledge. Studies have shown that students' knowledge of first aid increases after receiving training (Eyi et al., 2016; Bulduk, 2017; Akkan, 2018; Mohammed, 2018; Panda et al., 2019; Aktaş et al., 2020; Cheng et al., 2021; Mehreen et al., 2021; Düdükçü et al., 2022; León-Guereño et al., 2023). Since education is a value that increases awareness, nurses should provide education in schools to improve students' basic first aid knowledge and skills. In addition, incorporating first aid training into the school curriculum can be effective in quickly and accurately addressing accidents and injuries. In a similar study conducted with secondary school students, students received first aid training in two 45-minute sessions and were post-tested four weeks after the training. It was reported that the scores for students' knowledge of first aid increased as a result of the training provided (Aktaş et al. 2020). In a study conducted with primary and secondary school students aged 7-14, it was found that their knowledge about first aid increased after 40 minutes of training (Eyi et al., 2016).

Studies in various countries have shown that first aid training is effective in increasing secondary students' first aid knowledge. Bánfai et al (2017) conducted a study with students aged 7-14, providing them with theoretical and practical first aid training consisting of three 45-minute sessions. The study found that the training increased the students' knowledge and skills in responding to accidents that may occur at school.

Two studies conducted abroad with secondary school students found a significant increase in their knowledge level two weeks after receiving first aid training (Bandyopadhyay et al., 2017; Panda et al., 2019). The results of this research are similar to the literature. A systematic review study involving students aged 6-10 in America and Europe found that first aid programs improve students' knowledge and skills (Tse et al., 2023). In the study conducted by Wilks et al (2016), children aged 11-12 received one-day basic life support training. Tests were administered one week before, one week after, and eight weeks after the training. It was found that there was a statistically significant increase between the pre-test and post-test and the first aid knowledge provided was retained at the 8-week follow-up. They suggest that short, targeted training programs can significantly benefit children by providing them with basic skills and confidence to respond to emergencies (Wilks et al., 2016). Iserbyt et al (2014) reported a significant increase in the skill level of secondary school students after 50 minutes of basic life support training, and the students performed well in practice. In this study, students received two hours of theoretical and practical training, and the post-test administered four weeks after the training showed an increase in student knowledge, consistent with the literature.

In this study, it was found that while the age did not affect the average first aid knowledge scores, it was determined that the gender variable did. The mean first aid knowledge scores of female students were higher than those of male students. Research shows that students' scores on their knowledge of first aid tend to increase as they get older (Bánfai et al., 2017; Aksu, 2020). The cognitive and motor development of students increases with age, leading to greater success in their knowledge and skills related to first aid practices. This study found that the average first aid knowledge score was not affected by age. This may be due to the fact that the students were in a similar age group. Although this study found that female students had higher average first aid scores than male students, it was reported that gender had no effect on average first aid scores (Bulduk, 2017; Akkan, 2018; Aktaş et al, 2020). It is thought that this difference obtained from this study is only statistically significant, and the differences require further validation with a larger sample size.

CONCLUSION

The study found that the basic first aid knowledge of school-age children was inadequate, but after the training, the students' basic first aid knowledge and skills improved. Children may face various risks during their lives, and it is crucial for them to learn how to cope

with these situations to ensure their healthy and safe development. The health and safety of children play a crucial role in the future of societies. Being aware of the potential risks that children may encounter in their daily lives and having basic first aid skills that they can apply in case of any accident or injury will contribute to the protection and maintenance of children's health. Long-term studies aimed at improving health in schools and ensuring the continuity of educational programs that include awareness-raising activities for parents, teachers and other stakeholders will contribute to the awareness of the society. In addition, it is believed that providing school health services comprehensively to all children by employing nurses with at least a bachelor's degree and school health nursing training in all schools will contribute to the protection and improvement of students' health.

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