

# Evaluation of First Aid Knowledge Levels of Elementary Teacher Education Students at a Public University in İstanbul

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## Abstract

**Aim:** Children are prone to unexpected accidents and injuries, making emergency preparedness essential in schools. Elementary teachers must be skilled in first aid. This study aims to evaluate first aid knowledge and raise awareness among students in an elementary teacher education program at a public university in İstanbul.

**Materials and Methods:** This cross-sectional study targeted 200 students of second-, third-, and fourth-year in the elementary teacher education program at a public university during the 2023-2024 academic year. Surveys included questions on sociodemographic factors and the First Aid Knowledge Level scale (FAKLS), scored from 0 to 46, with scores  $\geq 40$  indicating adequate knowledge. Data analysis employed Jamovi software, with a significance level of 0.05.

**Results:** Of the 174 students participating in the study, 76.4% (n=133) were female with a median age of 22 years. 11.6% (n=20) had a family member in the healthcare field, and 31.0% (n=54) had prior first aid training. Based on the FAKLS, 98.3% (n=171) had insufficient first aid knowledge. Second-year students scored significantly higher on the FAKLS than those in other years ( $p=0.018$ ), and students with a family member in healthcare also performed better ( $p=0.006$ ). Students who hesitated about performing first aid had significantly higher FAKLS scores than those who did not hesitate ( $p=0.030$ ).

**Conclusion:** This study highlights the insufficient first aid knowledge among elementary teacher education students. To address this, it is recommended that first aid training be systematically planned, ongoing, and practice-oriented, and that it be incorporated into university curricula.

**Keywords:** First aid knowledge level, elementary teacher education students, teacher candidates, first aid knowledge

## Introduction

First aid is defined as practices performed to saving life or preventing the situation from worsening in case of an accident or life-threatening situation until the help of medical personnel is provided (1). It is important that all members of the society can perform these interventions correctly, regardless of whether they have received health education or not (2). Every individual encounter situation that suddenly require first aid throughout their life, and they should be knowledgeable and prepared for these situations. First aid knowledge enables quick and effective intervention in unexpected situations. First aid knowledge

provides the ability to protect not only one's own safety but also the health of those around them. Providing first aid in a timely and effective manner can prevent further harm and death. Therefore, learning and frequently updating first aid skills contributes to each individual's ability to create a safer environment in society. In learning first aid information, one should learn what not to do, as well as what to do (3). The person administering first aid can also save lives by preventing things that should not be done during an accident.

Elementary teachers play a critical role in the education and development processes of students. Teachers are responsible not



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only for the academic success of students, but also for their safety. Children may encounter unexpected accidents and injuries more often than adults. Considering that students spend a significant amount of their time in school, there is always the possibility of unexpected situations arising in the school environment (4). Therefore, teachers who care for children should be prepared and experienced for all kinds of emergency situations such as accidents, injuries, and poisoning (5). Children may encounter unexpected accidents and injuries more often than adults. According to 2021 data from the Turkish Statistical Institute, deaths due to external injuries and poisonings between the ages of 5-14 constitute 20.2% of all deaths (6). In this context, it is vital that teachers, especially elementary teachers, who spend a significant amount of time with students, apply first aid interventions correctly. In addition, teachers' lack of current first aid knowledge may lead to incorrect first aid practices being administered to students, resulting in possible adverse outcomes. Therefore, it is extremely important for teachers to know proper first aid interventions (7).

The aim of this study is to evaluate the first aid knowledge levels of students studying at Marmara University Atatürk Faculty of Education, Department of Elementary Teacher Education, to raise awareness among students, and to encourage them to intervene in case of emergency.

## Materials and Methods

### Type of Research

This is a cross-sectional study. The approval from Marmara University Faculty of Medicine Ethics Committee was obtained with the (decision number: 2023/09/08.12/1632, date: 08.12.2023) and permission was granted by the Department of Elementary Teacher Education with the decision number: 2024/01/05/703816. The study was conducted in accordance with the principles of the Helsinki Declaration.

### Sample

The population of the research consists of 450 students studying in all classes at a public university; department of elementary teacher education, in İstanbul, Türkiye, during the 2023-2024 academic year. First-grade students, who were considered to lack a developed awareness of elementary teacher education, were excluded from the study. All second, third, and fourth-grade students (n=250) were invited to participate, and 69.6% of the sample (n=174) was reached. While the sample size was 208, 174 data was collected because the administration of the survey coincided with the exam week, and the students were busy working.

### Data Collection

After obtaining written consent from the participants, data were collected through a survey conducted under observation voluntarily between 10-16 January 2024. The first part of the survey consists of questions about sociodemographic characteristics (age, gender) and related factors that may affect the level of first aid knowledge. These factors include receiving first aid training, the perceived usefulness of the training received, the possession of a first aid certificate approved by the Ministry of Health, and past situations where first aid was needed. The second part of the survey includes the First Aid Knowledge Level scale (FAKLS) (8). The scale consists of 23 propositions with two sub-dimensions. Two propositions (7 and 22) present conflicting arguments. The maximum score that can be obtained from the scale is 46, and the minimum is 0. Those who score 40 or more on the scale are considered to have sufficient first aid knowledge. The Cronbach's alpha value of the survey is 0.87.

### Statistical Analysis

Categorical data are presented in tables with percentages and frequencies. The chi-square test was applied to evaluate categorical variables. For continuous variables, the mean, standard deviation, median, minimum, and maximum values were calculated, and normality tests, including the Kolmogorov-Smirnov test and histograms, were applied. In comparing the means of two groups, the Student's t-test was used for data presenting normal distributions, and the Mann-Whitney U test was used for non-normal distributions. When it was desired to compare the average of more than two groups and the subgroups were not normally distributed, the Kruskal-Wallis test was applied. The statistical significance level was accepted as 0.05.

## Results

A total of 174 students participated in the research (Table 1). The mean age of the students is 21.9 years ( $\pm 1.8$  years; median: 22.0 years; min-max: 19-30 years). The other characteristics of the participants are presented in Table 1.

Those who have previously performed first aid response to the question "If you have performed an first aid, what was the intervention aimed at?": 44.4% (n=8) "First aid for a case of foreign body escape", 22.2% (n=4) "First aid for a case of unconsciousness", 5.6% (n=1) "First aid for injuries", 5.6% (n=1) "First aid for bleeding and shock", 5.6% (n=1) "First aid for burns, heatstroke and frostbite", and 16.6% (n=3) "Other".

To the question "Do you have any hesitations about giving any first aid intervention?", 87.4% of participants (n=152) answered "Yes" (Table 1). When we asked the participants what their

<b>Table 1. Sociodemographic characteristics</b>		
<b>Characteristic</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
Female	133	76.4
Male	41	23.6
<b>Age groups (Years)</b>		
19-20 years	36	20.7
21 years	42	24.1
22 years	40	23.0
23 years and above	56	32.2
<b>Grade</b>		
Second grade	51	29.3
Third grade	74	42.5
Fourth grade	49	28.2
<b>Healthcare worker in the family</b>		
Yes	20	11.6
No	152	88.4
<b>Previous first aid training</b>		
Yes	54	31.0
No	120	69.0
<b>Location of previous first aid training</b>		
High school	15	27.8
University	4	7.4
Driving license course	25	46.3
Non governmental organisation	2	3.7
Public Education Center	6	11.0
Internet	1	1.9
Scout camp	1	1.9
<b>If he/she received training, whether he/she found the training useful</b>		
Yes	26	48.1
No	11	20.4
Undecided	17	31.5
<b>Having a first aid certificate approved by the Ministry of Health</b>		
Yes	5	9.4
No	169	90.6
<b>First aid intervention has ever been performed before</b>		
Yes	18	10.3
No	154	88.5
Do not want to answer	2	1.2
<b>If there was a situation around you that required first aid intervention, would you have the courage to intervene?</b>		
Yes	51	29.3
No	59	33.9
Undecided	64	36.8
<b>Being hesitant about giving any first aid intervention</b>		
Yes	152	87.4
No	22	12.6

hesitations were, the answers were: “I am afraid of making the wrong intervention and having a bad outcome,” “I don’t feel competent because I don’t have any training,” “I received training, but I don’t think the training I received is sufficient,”

### First Aid Knowledge Scale

The responses given by participants to the questions on the FAKLS are provided in Table 2. In the 23-question scale used in the study, the question with the highest rate of incorrect answers among students was related to how to provide first aid to a drowning person, with an error rate of 45.4%. Conversely, the question most frequently answered correctly by students, at a rate of 92.5%, was about the symptoms of individuals with head trauma and the necessity of seeking emergency medical services (Table 2).

The participants’ average total score for the FAKLS is 32.3 ( $\pm 4.2$ ; median: 33.0; minimum: 20.0 - maximum: 41.0). While 98.3% of participants (n=171) had insufficient first aid knowledge, only 1.7% of them (n=3) were found to have sufficient knowledge.

In the study, a significant difference was found based on the students’ grade ( $p=0.018$ ), with FAKLS scores decreasing as the grade level increased. 2<sup>nd</sup>-grade students had significantly higher FAKLS scores compared to 4<sup>th</sup>-grade students (Table 3). Among 54 students who previously received first aid training, the average time since their last training was 39.0 months. No significant difference in FAKLS scores was found between those who had received first aid training and those who had not ( $p=0.694$ ), nor was there a correlation between the time since training and FAKLS scores.

### Discussion

Our research aimed to measure and evaluate the FAKLS of university students in the elementary teacher education department, who take an active role at all levels of society.

The study revealed that the majority of students (69.0%) had not received any prior first aid training. Similar findings have been reported in studies conducted at various faculties of different universities in Türkiye, showing comparable rates of students receiving first aid training (9-11). The most common place where participants received first aid training was driver’s license courses, followed by high schools and public education centers in the study. Although health education classes are offered in primary and secondary schools in Türkiye, the majority of the population receives first aid training during driving courses. However, it is crucial to introduce such an important topic at an earlier age. Moreover, only 9.4% of participants possess a first aid certificate approved by the Ministry of Health. while only 29.3%

<b>Questions</b>	<b>True n (%)</b>	<b>False n (%)</b>	<b>I don't know n (%)</b>
1. The three most important steps in first aid are: evaluation of the respiratory tract, evaluation of breathing, and evaluation of circulation.	117 (67.3)	10 (5.7)	47 (27.0)
2. The primary purposes of first aid are to ensure the maintenance of vital functions, to prevent the patient's condition from worsening, and to facilitate recovery.	158 (90.8)	8 (4.6)	8 (4.6)
3. Eliminating life-threatening situations is one of the primary goals of first aid.	133 (76.4)	25 (14.4)	16 (9.2)
4. In emergency situations where an accident occurs, the first thing to do at the scene is to create a safe environment by identifying possible dangers.	151 (86.8)	10 (5.7)	13 (7.5)
5. Initial care, such as opening the airway and applying pressure to the area of severe bleeding, should be provided before leaving the patient's side to call 112 for help.	106 (60.9)	20 (11.5)	48 (27.6)
6. When an emergency ambulance call is made, the place where the incident took place, the caller, the description of the incident, the number of patients or injured people, their condition, and what kind of help they received should be explained.	156 (89.7)	6 (3.4)	12 (6.9)
7. If a patient with an injured spine is conscious, he/she should be allowed to move.	152 (87.3)	5 (2.9)	17 (9.8)
8. If the shock is not caused by trauma or injury, first aid should be given to the patient by opening the respiratory tract, laying his/her on her back, and elevating the legs 30-60 degrees	69 (39.7)	9 (5.2)	96 (55.1)
9. For diagnosed asthma patients who complain of shortness of breath, previously prescribed inhaler bronchodilators (drugs that are inhaled, expand the bronchi and help breathing) should be used.	86 (49.5)	22 (12.6)	66 (37.9)
10. The patient suspected of having a stroke should be evaluated quickly to see whether there is sagging or retraction on his face, whether his arm falls within 10 seconds when he raises his arm and closes his eyes, whether there is any speech disorder, and when he last appeared normal.	84 (48.3)	8 (4.6)	82 (47.1)
11. A patient with chest pain who is suspected of having a heart attack should be given chewable aspirin and 112 should be called.	23 (13.2)	56 (32.2)	95 (54.6)
12. In case of anaphylaxis, emergency call should be called immediately, and it should be administered immediately to individuals who are known to have a diagnosed anaphylactic reaction and have a prescription adrenaline injector.	37 (21.3)	10 (5.7)	127 (73.0)
13. Patients with complaints of hunger, tremors, sweating and restlessness should be considered as having low blood sugar, they should be encouraged to consume sugary drinks and foods, and their complaints should be expected to subside within 10-15 minutes. If it does not subside or if there is a deterioration in consciousness, 112 should be called immediately.	84 (48.3)	35 (20.1)	55 (31.6)
14. In case of dehydration caused by excessive exercise and sweating, the patient should be given an electrolyte-rich drink (water containing lemon, salt, sugar).	56 (32.2)	19 (10.9)	99 (56.9)
15. Eyes exposed to toxic chemicals should be washed with plenty of water for 15 minutes and emergency healthcare services should be sought.	112 (64.3)	13 (7.5)	49 (28.2)
16. In a patient with an open wound and bleeding, direct pressure should be applied to the bleeding area until it stops.	96 (55.2)	26 (14.9)	52 (29.9)
17. It is recommended that the tourniquet be applied by specially trained people due to the harm it may cause in patients with heavy and external bleeding.	133 (76.4)	4 (2.3)	37 (21.3)
18. If people with head trauma have complaints such as feeling dizzy, headache, nausea, visual impairment, or confusion, they should definitely seek emergency medical services.	161 (92.5)	2 (1.1)	11 (6.4)
19. In cases where spinal cord injury is suspected, it is recommended that the patient wear a neck collar by the first aid practitioner.	116 (66.7)	15 (8.6)	43 (24.7)
20. In case of electric shock, the victim's contact with the electric current is cut off with a piece of wood or plastic.	134 (77.0)	11 (6.3)	29 (16.7)
21. In case of heat stroke, liquid drinks should be given to the patient if there is no nausea or vomiting.	61 (35.1)	24 (13.8)	89 (51.1)
22. The swallowed water of a drowned person should be removed by applying pressure to his/her abdomen and chest.	27 (15.5)	79 (45.4)	68 (39.1)
23. In cases of chemical poisoning, all clothing should be removed and the body should be washed with plenty of water.	17 (9.8)	43 (24.7)	114 (65.5)

Table 3. Comparison of independent variables with the first aid knowledge level scale					
Characteristic	n	%	Median	IQR	p value
Gender					
Female	133	76.4	33.00	5.0	0.094
Male	41	23.6	32.00	5.0	
Age groups (Years)					
19-20 years	36	20.7	32.5	6.5	0.421
21 years	42	24.1	34.0	6.0	
22 years	40	23.0	32.0	4.0	
23 years and above	56	32.2	32.0	4.0	
Grade					
Second grade	51	29.3	34.00	7.0	0.018
Third grade	74	42.5	32.50	5.0	
Fourth grade	49	28.2	32.00	5.0	
Healthcare worker in the family					
Yes	20	11.6	34.00	5.75	0.006
No	152	88.4	32.00	5.0	
Previous first aid training					
Yes	54	31.0	32.00	6.0	0.694
No	120	69.0	33.00	5.0	
If he/she received training, whether he/she found the training useful					
Yes	26	48.1	32.50	6.5	0.377
No	11	20.4	31.00	8.0	
Undecided	17	31.5	32.00	5.5	
Having a first aid certificate approved by the Ministry of Health					
Yes	5	9.4	37.00	9.5	0.151
No	169	90.6	32.00	5.0	
First aid intervention has ever been performed before					
Yes	18	10.3	32.00	5.75	0.903
No	154	88.5	33.00	5.0	
Do not want to answer?	2	1.2	32.50	5.0	
If there was a situation around you that required first aid intervention, would you have the courage to intervene?					
Yes	51	29.3	33.00	6.0	0.929
No	59	33.9	32.00	6.0	
Undecided	64	36.8	33.00	5.0	
Being hesitant about giving any first aid intervention					
Yes	152	87.4	33.00	5.0	0.030
No	22	12.6	30.00	7.5	
IQR: Interquartile range					

of participants expressed confidence in applying first aid, 87.4% stated they would hesitate to perform it. This situation once again highlights the gravity of the issue.

A significant difference was found between the students' FAKLS scores depending on the grade they were in, and as the grade increased, a decrease was found in their FAKLS

score of the 2<sup>nd</sup> grade is significantly higher than that of the 4<sup>th</sup> grade. This situation may indicate that participants mostly receive first aid training since high school and that university first aid education is provided in a more superficial manner. This problem can be eliminated by providing planned and continuous first aid training to students every year.



It was found that 98.3% of the participants had insufficient first aid knowledge. In a study conducted in 2020 at the faculties of education of a university, the knowledge levels of teacher candidates were found to be approximately 50% (9). Similarly, a study conducted with vocational school students also found their knowledge level to be around 50% (12). Other studies found that the majority of students' FAKLS was insufficient in case of a possible emergency (13,14). In our study, the reason a large proportion of students was found to be insufficient may be because of the high cut-off value of the scale used and the binary classification as sufficient or insufficient. If a three-tier scoring system had been applied, it would have been observed that our participants also achieved a moderate level score. Since students are future elementary teachers and unexpected situations can arise in schools, awareness should be increased through legal regulations mandating compulsory first aid courses throughout their education. Studies have shown that first aid training has a positive impact on first aid skills (15,16).

In our research, 87.4% of the participants stated that they would hesitate to provide first aid. In a study in Türkiye, it was found that when candidate teachers were asked if they would provide first aid when faced with someone who needs it, only 8.0% said yes (17). A qualitative study on the public's willingness to perform cardiopulmonary resuscitation (CPR) found that individuals who are knowledgeable about CPR are more likely to voluntarily perform it (18). It is evident that enhancing students' first aid knowledge is crucial, as individuals who are knowledgeable about first aid practices are likely to provide first aid without hesitation.

In the current study, a significant difference was seen between the FAKLS scores of those who were hesitant about giving any first aid intervention compared to those who were not. The FAKLS scores of those who were hesitant were higher. The reason for this may be that people with hesitations already understand the importance of first aid and have more knowledge and experience regarding interventions. The fact that they have more knowledge and experience but may lack certain practical skills may have led students to abstain.

The lack of significant effect on the FAKLS scores from having a first aid certificate approved by the Ministry of Health did not significantly affect the FAKLS scores may be due to the fact that, only 9.4% of those who received first aid training had the certificate they received their first aid training an average of 39 months ago. It may have caused the learned information to be forgotten over time. The FAKLS scores of students who had a healthcare worker in their family were found to be significantly

higher than those of students who did not. This actually shows that parents being knowledgeable causes their children to be knowledgeable. Therefore, awareness about first aid should be created not only among students but also in all segments of society. Public health courses and formal first aid training should be organized.

When the general knowledge level was examined using the 23-question scale, in our research, it was seen that most students gave incorrect answers to the questions about how first aid should be given to a drowned person and a patient with chest pain who is suspected of having a heart attack. In this case, it has been observed that students do not have sufficient knowledge about situations such as drowning and swallowing water, are unaware that no medical drugs should be used in first aid, and that sufficient training is not given in schools on this subject. It has been determined that students are generally aware of issues such as the symptoms of people with head trauma and the need to seek emergency health services. In another study, when the students' general knowledge levels regarding first aid were examined, it was determined that the majority of them knew that the primary purpose of first aid was to eliminate life-threatening situations, 112 should be called after administering first aid, and that the injured person should not be moved (11). The high rate of students who have the misconception that first aid is only performed by people trained in a health-related department, shows that there is a lack of awareness on this issue (3).

### Study Limitations

The study has some limitations. Efforts were made to reach all participants; however, because the data collection period coincided with the exam season, not all participants could be reached. Secondly, the high cut-off score of the scale used in the study led to most participants being categorized as having insufficient first aid knowledge. Therefore, it is recommended that the cut-off value of the relevant scale be reconsidered.

### Conclusion

The study shows that elementary teacher candidates have low first aid knowledge. Considering that accidents are likely to occur frequently in schools, the necessity for teacher candidates to receive first aid training during their university education has become evident. Therefore, planned and continuous training should be supported by practice-based first aid training, especially in educational institutions. In future studies aimed at measuring the first aid knowledge of society, research will help to better identify deficiencies.

## Ethics

**Ethics Committee Approval:** The approval from Marmara University Faculty of Medicine Ethics Committee was obtained with the (decision number: 2023/09/08.12/1632, date: 08.12.2023) and permission was granted by the Department of Elementary Teacher Education with the decision number: 2024/01/05/703816. The study was conducted in accordance with the principles of the Helsinki Declaration.

**Informed Consent:** This is a cross-sectional study.

## Footnotes

### Author Contributions

Concept: F.B.D., S.T.N., M.K., S.H., Design: F.B.D., S.T.N., M.K., S.H., Data Collection or Processing: F.B.D., B.K., B.Ö., M.C., S.F., Analysis or Interpretation: F.B.D., S.T.N., M.K., S.H., B.K., B.Ö., M.C., S.F., Literature Search: F.B.D., M.K., S.H., B.K., B.Ö., M.C., S.F., Writing: F.B.D., B.K., B.Ö., M.C., S.F.

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