ORIGINAL RESEARCH

Incidents That Require First Aid in Schools: Can Teachers Give First Aid?

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ABSTRACT

Objective: School-aged children are a risk group in terms of accidents and injuries, and these factors may be the primary causes of death in children. Teachers have important roles in preventing accidents and injuries and giving first aid. The purpose of this research was to identify situations in which teachers most frequently encounter the need to administer first aid to children and whether the teachers performed the correct application in these events.

Methods: This descriptive study was conducted with 331 teachers in a city in the Central Anatolia Region. The study was approved by the local ethics committee and the participants.

Results: Of the 45.3% teachers educating children ages 6 to 15 years, 81.0% of the teachers were familiar with first aid, but only 23.0% claimed to have an adequate knowledge. In the previous year, situations that had required first aid included epistaxis (75.2%), abdominal pain (49.2%), and vomiting (39.2%). The study also investigated any accidents and injuries occurring, their causes, and the teachers' interventions following the accidents and injuries. It was found that teachers had information about first aid, but they did not trust themselves enough to practice it.

Conclusion: Understanding the causes of accidents and injuries, finding preventive measures, and updating teachers' knowledge about this subject are important to provide a safe educational environment. (*Disaster Med Public Health Preparedness*. 2019;13:456-462)

Key Words: accident, children, first aid, injury, teacher

Injuries to children arising from incidents and accidents are an increasing community health concern.[1] In the study of Kyu et al that assessed the distribution and trends of the main causes of death among children ages 5 to 9 years and 10 to 14 years from 1990 to 2016, in 51 countries in the World Health Organization (WHO) European Region, accidents and injuries were the major cause of mortality in children ages 5 to 14 years. More effort is needed to provide adequate knowledge of injuries, that is, first aid training as well as practice, therefore reducing the mortality rate of children.[2]

WHO defines an accident as an unexpected event that leads to bodily or psychological damage that occurs suddenly outside human will.[3] Accidents and injuries are a health problem that occurs within a triangle formed by the individual, agent, and environment, causing the sudden appearance of individual, mechanical, and biochemical damage to the organism, potential loss of human and other lives, disability, and loss of property. Accidents are also a social issue.[4] Because not all accidents and injuries require a referral to a health facility, and most accidents and injuries can be cured by first aid, a complete statistical assessment of accidents and injuries is not possible. However, studies show that children (as well as elderly individuals) are the most vulnerable to accidents and injuries. Injuries and accidents are among the leading causes of death in children worldwide, and accidents during childhood cause significant health problems.[5]

Children are vulnerable to accidents and injuries and are more likely to be exposed to them, according to their age and level of development. There are physical, anatomical, and physiological differences that distinguish children from adults. Children's mobility is not fully developed, and their cognitive and behavioral development are not complete. For example, infants cannot communicate verbally and vocalize sounds only. They move quickly and are totally dependent on the people who provide their care. Falls, foreign body obstructions, drowning, burns, and child abuse are more common in infants. Young children (toddlers and preschool age) are curious, constantly exploring and unaware of danger. The risk of falls, burns, drowning, poisoning, and child abuse is high,[4] and the incidence varies according to the age group of the child.

It has been found that children under age 5 years are not able to detect danger, that they have not acquired an ability to be aware of their location (even though

their visual and hearing thresholds are high at this age), and their awareness of traffic is not well established until they are 10 to 12 years old.[6] An estimated 10% to 25% of accidental injuries each year in more than 14 million children ages 14 years and under occur in schools or near them. More than 53 million children in the United States spend about a quarter of their waking hours in school or school facilities. According to Eraslan and Aycan, US data show that 1 of 14 children between ages 5 to 19 years is injured at school.[7] In Turkish Statistical Institute (TUIK) statistics, published in 2013, the death rates of children between 0 and 14 years old from external injuries and poisoning were 8.09%, 6.98%, and 7.23% in 2010, 2011, and 2012, respectively.[8]

It is primarily the responsibility of the existing health personnel to make the initial interventions necessary in the case of accidents involving schools or problems that may arise for students as a result of emergencies or existing illnesses.[9] Within school health services, the school health nurse has important duties. It is necessary for the nurse to coordinate with school administrators on issues related to school health services, to identify needs, to identify health risks early, and to plan appropriate initiatives and take the necessary measures. With regard to students assessed with chronic illness and allergies, the students and their parents have a duty to protect and improve the health of other students and the staff, through health counseling for the family and the teacher, health and safety precautions to protect against accidents, and cooperation between the student, family, school management, and educators.[10] However, there are still very few schools where school health nurses work in Turkey. In many schools, particularly in public schools, this duty falls instead on the teachers who are also members of the school health team, and teachers have important roles in the implementation of school health and health education programs.[11] The primary responsibility for a student's health is the family; however, outside of the family, the teacher is responsible for the health of the student in the classroom. Teachers are the first people to help a student in the event of an accident or injury in school, so they are required to know the basic first aid rules. If it is assumed that the first people who arrive at the scene of an accident at school are teachers, then these individuals should have a high level of knowledge about first aid to be able to intervene successfully.[12]

The objective of this study was to identify those situations in which the teachers most frequently needed to use first aid on children and whether the teachers performed the correct interventions. The results of the study will help develop teachers' first aid training and practices for the prevention and treatment of accidents and injuries in schools.

Research Questions

(1) What are the situations requiring teachers to intervene with first aid in school during the last year?
(2) What are the observations and opinions of teachers about accidents and injuries in their schools?
(3) What are the behaviors of teachers following accidents and injuries?
(4) What teacher characteristics influence their ability to provide first aid?

METHODS

Study Type

The study type is descriptive.

Sample and Setting

The study was conducted in a city in Central Anatolia. On the dates when the study was performed, there were 122 state elementary schools and 81 state junior high schools in the medium-sized city in Turkey. In the undergraduate curriculum of the Faculty of Education, there is a first aid course, and teachers receive first aid training as part of in-service training programs when they begin their employment. However, the training is not made mandatory, so not all teachers are equipped with the ability to give first aid. The study population consisted of 2,353 teachers who worked in schools in the city. The sample of the study was 331 ($N = 2{,}353$; $t = 1.96$, $P = 0.5$; $q = 0.5$; $d = 0.05$). The sample was identified using the simple random sampling method and random number table.

Study Tools and Implementation

To achieve the sample size, the schools were selected randomly by the cluster sampling method and a questionnaire consisting of 16 questions that were created by the researchers and applied using the face-to-face interview technique in the schools that agreed to participate in the study. Interviews lasted about 20 minutes. To test the adequacy and clarity of the questionnaire prepared in the research, a pre-application was carried out on 10 teachers. The research was completed by giving the questionnaires to 331 teachers participating voluntarily in the study from September 2014 to February 2015.

Data Evaluating

The study data were evaluated using numbers, percentages, mean, and chi-square tests. Permission was obtained from the Provincial Directorate of National Education before the research started.

Ethical Considerations

Teachers who agreed to participate in the research were informed about the purpose of the research, and their informed consent was obtained. The Meram Medical Faculty Ethics Committee at Necmettin Erbakan University approved the research (Ethics committee decision number: 2014/684).

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Limitations of the Research

Applications could not be grouped because the types of accidents and injuries faced by teachers are so varied, and their practice is very different; therefore, there is no mention in the study about first aid practices.

RESULTS

When the sociodemographic characteristics of the teachers participating in the survey were examined, the mean age of the teachers was found to be $\bar{x} = 39.1 \pm 7.9$; 53.8% were female, 46.2% were male, 91.5% were married, and 89.1% had children. When the professional characteristics of the teachers were examined, 58.0% of the teachers were teaching in elementary schools, and 42.0% were teaching in junior high schools; 45.3% were class teachers, 5.1% were in the field of psychological counseling and guidance, and 49.5% were working in other subjects; 74.9% had professional experience of 11 years or more, 95.2% had a bachelor's degree, and 4.8% had a master's degree; 81.0% of the teachers had already received first aid training, and 27.8% had received this training within the last 3 years. The majority of the training took 28 hours, and 23.0% of the teachers felt that they had adequate first aid knowledge (Table 1).

When the situations in which teachers had to intervene with first aid were examined, it was determined that, in the previous year at school, they had been faced mostly with bleeding and shock, medical emergencies and injuries, and with lower rates of poisoning and animal bites, burns, and injuries related to freezing conditions, cardiopulmonary emergencies, the presence of foreign bodies or drowning, and psychological emergencies. According to the findings, teachers had experienced 75.2% cases of epistaxis, 49.2% cases of abdominal pain, 39.3% cases of vomiting, 36.9% cases of crushing/bruising, 33.5% cases of sprain, and 30.8% facial injuries. These were the most frequent cases requiring intervention (Table 2).

TABLE 1

Teachers' Characteristics (n = 331)

Characteristics	Variable	n	%
Age ($\bar{x} = 39.1 \pm 7.9$)	23-39 years old	177	53.5
	40-60 years old	154	46.5
Gender	Female	178	53.8
	Male	153	46.2
Marital status	Married	303	91.5
	Single	28	8.5
Parental status	Having children	295	89.1
	Not having children	36	10.9
Type of school	Elementary school	192	58.0
	Junior high school	139	42.0
Subject/specialty	Classroom teachers	150	45.3
	Other subject teachers	164	49.5
	Psychological counseling and guidance teachers	17	5.1
Duration of professional experience	1-3 years	19	5.7
	4-10 years	64	19.4
	11 years and over	248	74.9
Qualification	Bachelor's degree	315	95.2
	Master's degree	16	4.8
First aid training status*	First aid training	268	81.0
	No first aid training	63	19.0
Adequacy of knowledge of first aid	Adequate	76	23.0
	Inadequate	255	77.0

*27.8% of teachers had received this first aid training within the last 3 years. The majority of the training took 28 hours.

TABLE 2

Situations Requiring Teachers to Intervene with First Aid in School During the Last Year (n = 331)

Status that Requires First Aid	Types*	N	%
Bleeding and shock	Epistaxis	249	75.2
	Other external bleeding	82	24.8
	Shock	13	3.9
Medical emergencies	Abdominal pain	163	49.2
	Vomiting	130	39.3
	Diarrhea	84	25.4
	High fever	68	20.5
	Fainting/loss of consciousness	61	18.4
	Epilepsy	23	6.9
	Convulsions	17	5.1
	Child pregnancy/ emergency delivery/ abortion	3	0.9
	Diabetic coma	2	0.6
Injuries	Crushing/bruising	122	36.9
	Sprain	111	33.5
	Facial injuries	102	30.8
	Muscle cramps	55	16.6
	Fracture	49	14.8
	Dislocation	37	11.2
	Head trauma	14	4.2
	Abdominal trauma	8	2.4
	Eye injuries	7	2.1
	Chest trauma	5	1.5
Poisoning and animal bites	Animal bite	34	10.3
	Allergic reactions	22	6.6
	Oral poisoning	10	
	Carbon monoxide poisoning	9	2.7
Emergencies related to burning and frost	Heatstroke	30	9.1
	Burns	29	8.8
	Frostbite	8	2.4
	Electric shock	6	1.8
Cardiopulmonary emergencies	Respiratory arrest	10	3.0
	Cardiac arrest	5	1.5
Foreign bodies/drowning	Foreign bodies in the nose	10	3.0
	Respiratory tract obstructions	8	2.4
	Foreign bodies in the ear	3	0.9
	Drowning	2	0.6
Psychological emergencies	Acute stress disorder	9	2.7
	Suicide	3	0.9

*Teachers selected more than 1 option.

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TABLE 3

The Observations and Opinions of Teachers About Accidents and İnjuries at Schools (n = 331)

Observations and Opinions*		n	%
Presence of conditions that may cause accidents and injuries at school	Yes	155	46.8
	No	170	51.4
Preventive measures taken against accidents and injuries in school	Yes	266	80.4
	No	54	16.3
Areas of school where the accidents and injuries occur	In the playground	302	91.2
	On stairs	283	85.5
	In the classroom	238	71.9
	On the road outside of the school	156	47.1
	In the gym	153	46.2
Times when accidents and injuries occurred in school	Breaktime	315	95.2
	During sports lessons	5	1.5
	During classes	5	1.5
	Arriving at and departing from school	4	1.2
Causes of accidents and injuries in children	Unthinking behavior	242	73.1
	Wanting to move around	175	52.9
	Age-specific behavioral characteristics	165	49.8
	Child's inability to coordinate multiple movements at the same time	84	25.4
	Inadequate protection against accidents and injuries in the physical environment of the school	78	23.6
	Child's fine motor skills not developed	67	20.2
	Sight or hearing issues in child; disabilities	31	9.4

*Teachers selected more than 1 option.

TABLE 4

Behaviors of Teachers Following Accidents and Injuries (n = 331)

Behaviors		n	%
Giving first aid	Yes	107	32.3
	No	224	67.7
Other behaviors	Called for an ambulance	159	48.0
	Referred to the people who knew first aid well	123	37.2
	Went to a health institution	75	22.7
	Did not do anything	17	5.1

*Teachers selected more than 1 option.

When the teachers' observations and opinions about the accidents and injuries occurring in their schools were examined, 46.8% stated that there were conditions that could cause accidents and injuries in their schools, and 80.4% said protective measures against accidents and injuries had been taken. They observed that 91.2% of the accidents occurred in playgrounds, 85.5% on stairs, 71.9% in classrooms, 47.1% on the road, 46.2% in the gym, and 95.2% during breaktime. They found that 73.1% of the children displayed "unthinking behavior," 52.9% were "wanting to move around," and 49.8% showed age-specific behavioral characteristics (Table 3).

When teachers were asked about their responses in the situations of accident and injury they had previously encountered: only 32.3% of them stated that they could give first aid; 48.0% stated that they called for an ambulance; 37.2% referred to personnel in the school who knew first aid well; 22.7% went to a hospital, and 5.1% did nothing (Table 4).

According to the characteristics of teachers, it was found that individuals who were over 40 years old were more likely to be able to give first aid (37.0%) than younger ones (28.2%); men (35.3%) were able to give first aid more than women (29.8%); both married (32.3%) and single (32.1%) people were able to give first aid at close quarters; parents (32.5%) were able to give more first aid than those without children (30.6%); teachers in elementary schools (38.5%) and those who were classroom teachers (41.3%) were able to give more first aid than those in junior high schools and other subjects; and that, as the duration of experience increases, the ability to give first aid also increased (21.1% of experienced 1-3 years, 31.2% of experienced 4-10 years, 33.5% of experienced 11 years and over). While teachers' ability to give first aid was significantly influenced by the type of school they worked at, their subjects and their feelings of having adequate knowledge of first aid ($P < 0.05$), age, gender, marital status, parental status, professional experience, level of education, and whether first aid training had been received did not make a significant difference in first aid cases ($P > 0.05$) (Table 5).

DISCUSSION

In injuries resulting from accidents at school, teachers are the first to be able to help the child and apply first aid. First aid is very important in terms of involving simple interventions that can prevent further damage and death. Therefore, it is very important for teachers to feel that they can adequately carry out first aid and perform the proper intervention.[13,14] In general, society does not provide sufficient information about first aid. In this respect, it is important to educate those groups of people (parents, teachers, drivers, etc.) who are likely to assume the position of first aid practitioners because of their social roles.[13,15] In this study, it was observed that the percentage of teachers who had received first aid education was high (81%). However, the rate of feeling that their knowledge of first aid was adequate was low (23%) (see Table 1). In the study of Joseph et al, only 69 (47%) teachers had received first aid training previously. Poor and moderate knowledge of first aid was observed among 19 (13%) and 127 (87%) teachers, respectively.[13] In another study, all

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TABLE 5

Teachers' Characteristics Influencing Their Ability to Practice First Aid (n = 331)

		Giving First Aid (n = 107)		Not Giving First Aid (n = 224)		
Characteristics	**Variable**	**n**	**%**	**n**	**%**	**Analysis**
Age	23-39 years old	50	28.2	127	71.8	$X^2 = 2.889$
	40-60 years old	57	37.0	97	63.0	$P = 0.089$
Gender	Female	53	29.8	125	70.2	$X^2 = 1.144$
	Male	54	35.3	99	64.7	$P = 0.285$
Marital status	Married	98	32.3	205	67.7	$X^2 = 0.000$
	Single	9	32.1	19	67.9	$P = 0.983$
Parental status	Have children	96	32.5	199	67.5	$X^2 = 0.058$
	Do not have children	11	30.6	25	69.4	$P = 0.709$
Type of school	Elementary school	74	38.5	118	61.5	$X^2 = 8.239$
	Junior high school	33	23.7	106	76.3	$P = 0.004$
Subject/specialty	Classroom teachers	62	41.3	88	58.7	$X^2 = 14.829$
	Other branch teachers	44	26.8	120	73.2	$P = 0.001$
	Psychological counseling and guidance teachers	1	5.9	16	94.1	
Duration of professional experience	1-3 years	4	21.1	15	78.9	$X^2 = 1.373$
	4-10 years	20	31.2	44	68.8	$P = 0.503$
	11 years and over	83	33.5	165	66.5	
Qualification	Bachelor's degree	103	32.7	212	67.3	$X^2 = 0.431$
	Master's degree	4	25.0	12	75.0	$P = 0.512$
First aid training status	First aid training	91	34.0	177	66.0	$X^2 = 1.766$
	No first aid training	16	25.4	47	74.6	$P = 0.184$
Adequacy perceptions of knowledge of first aid	Adequate	49	64.5	27	35.5	$X^2 = 44.251$
	Inadequate	58	22.7	197	77.3	$P = 0.000$

participating teachers indicated that they had knowledge of first aid, although 74.5% of the them evaluated their level of knowledge as "moderate" when asked.[14] In other studies, teachers stated that they found themselves to be inadequate at giving first aid.[13,16,17]. These results show that first aid training is especially important for teachers and that, although teachers are educated through institutional in-service training and undergraduate training, the training they receive is not sufficient or is difficult to put into practice. It is important to ensure that the information given in first aid training as well as the skills developed for application are permanent.

Children are at an inherent injury risk while participating in physical activities.[18] In a study of children requiring first aid in school, epistaxis (90.5%), high fever (77.9%), and head trauma (55.8%) were the top three causes.[19] Other studies have shown that sprain, shortness of breath, seizure, extremity fracture, head/neck injury, laceration, psychiatric emergency, abdominal pain, syncope, anaphylaxis, chest pain/palpitation[20] or bleeding, fainting, fractures and dislocations,[17] and minor injuries[21] were the most frequent injuries. Traumas that occur occasionally, such as falling and burning, are also common causes of injury in childhood. Falling is reported in 22% of cases of trauma in childhood. Bicycle and pedestrian traffic accidents are also highly prevalent in school children. In addition, birth trauma and battered child syndrome are problems peculiar to those in this age group. Motor vehicle accidents during adolescence, suicide, and murder are the most common causes of death.[22-24] Similar results were obtained in this study, and it was determined that the most common accidents and injuries were epistaxis, abdominal pain, vomiting, crushing/bruising, sprain, and facial injuries (see Table 2).

It is necessary to understand the factors in the environment that may cause accidents/injuries and to take precautions, especially where first aiders are present. Most injury prevention efforts have focused on the sports setting, but results suggest that many children sustain an injury during unorganized leisure-time physical activities.[18] In one study, 73.5% of the teachers stated that they had been questioned about whether the environment of the nursery was safe, and 21.4% of the teachers had stated that the environment they worked in was totally safe and that they felt safe.[16] In the study of Eraslan and Aycan, it was found that accidents and injuries to children occurred due to carelessness (48.8%) and falling from a flat area (22.4%).[7] Almost half of the teachers in this study argued that conditions of inherent risk to accidents and injuries were present in schools, and almost all of the teachers stated that it was encouraging that the necessary protective measures for accidents and injuries in school were being taken. According to the teachers' views, most of the students' accidents were caused by children's unthinking behavior,

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their desire to move around, and age-specific behavioral characteristics. The playground, stairs, and the classroom were identified as the places where children most frequently had accidents or received injuries at school (see Table 3). In a study similar to this one, when the places where children had accidents were examined, the highest rate of accidents occurred in the playground, followed by sports fields and the classroom.[25] In Eraslan and Aycan's study, it was found that most accidents occurred inside buildings (63.0%)[7]. In another study, it was seen that accidents and injuries occurred most frequently in playgrounds, stairs, and corridors.[19] Similarly to the teachers' opinions in this study (see Table 3), there are many reasons why children are likely to have accidents, such as behaving unthinkingly, wanting to move around, their inability to coordinate multiple movements at the same time, vision and hearing issues, lack of development to make small and delicate movements, and various age-specific behavioral characteristics. [23,25].

When examining the situations in which the teachers intervened and responded to incidents requiring first aid, one study found that 69.3% of the teachers intervened in a situation requiring first aid, and 30.7% called an ambulance without any intervention.[14] In another study, 50.7% teachers reported having practiced first aid in response to a situation arising at their school.[13] In a different study, it was determined that the majority of the teachers (73.6%) who stated that they had experienced 5 or more incidents intervened in every case requiring first aid.[25] In this study, it was determined that the teachers were aware of the necessary interventions to make in cases of accidents and injuries, that 32.3% of them gave first aid and many of them called for an ambulance (see Table 4).

When examining what features affected the use of first aid by teachers, the level of information of teachers with first aid training was higher when they were tested in studies on the first aid information levels of teachers;[26] age, duration of the study, situations in which first aid was required, and first aid information levels also affected the use of first aid.[14] In another study, teachers' confidence level in administering first aid was significantly associated with prior training in first aid.[13] In this study, teachers were asked whether they gave first aid, and it was found that teachers with first aid training were able to practice it. Teachers in elementary schools and classroom teachers were able to apply more first aid that would make a meaningful difference, and there was also a confluence between the feeling that they had adequate first aid knowledge and the ability to apply it (see Table 5).

CONCLUSION

First aid is a treatment that requires knowledge and one in which errors are unacceptable. If first aid is given by people who have not received proper training, this may have serious consequences. For this reason, first aid training is required for those who are most likely to be in a situation to practice it. It has been determined that training is frequently given in the school environment and that teachers are informed about the situations requiring intervention, but they are unable to transfer this learning into practice. It is important that their knowledge remains permanent and can be used practically. Inaccurately applied first aid can occur in situations where there is panic. It is suggested that training methods and techniques be examined in terms of developing people's skills to give first aid correctly in acute situations, and that the content of the training should address the most common situations encountered.

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Conflict of Interest Statement

The authors declare no conflict of interests.

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