Original Article

Knowledge and practice of secondary school teachers about first aid

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Abstract

Background: School students are vulnerable to the risks of accidents and injuries and hence require first aid more often than do adults. The first responsible person to reach an injured student at school is the teacher. **Aim:** To assess secondary school teachers' knowledge and practice regarding first aid. **Methodology:** Following a cross-sectional descriptive study design in Khamis Mushayt City, Saudi Arabia, 250 secondary school teachers (110 males and 140 females) were included in this study. A self-administered questionnaire designed by the researcher was used for data collection. **Results:** Main sources of knowledge for secondary school teachers were mass media, physicians, and educational school books. Most teachers are not trained on first aid. About half of the teachers face cases that need first aid, but only half of them provide the necessary first aid. Only 19.6% were knowledgeable regarding first aid, 48.8% faced cases that needed first aid, and only 54.9% of those who faced cases that needed first aid could provide the necessary first aid. Participants' knowledge grades differed significantly according to their age groups ($P = 0.003$), gender ($P = 0.035$), and experience in teaching ($P = 0.001$). **Conclusion:** Knowledge and practices of secondary school teachers on first aid need to be improved.

Keywords: Accidents, first aid, knowledge assessment, school teachers

Introduction

Every year, thousands of people experience or witness medical emergencies. When emergencies occur, family members, friends, colleagues, or bystanders often provide spontaneous help.[1]

Despite the fact that deaths due to accidents are inevitable and occur before prehospital medical care is available, accidents account for 8% of mortality and 13% of disability-adjusted life years, and the incidence estimates for trauma from accidents and incidence equal to one death and 18 persons needing first aid treatment per minute.[2,3]

Many people should be trained on first aid. Observational studies reported that in more than half of the cases, bystanders were at the accident site before the arrival of medical care. If these bystanders are able and willing to provide aid, they have the potential to save lives. The provision of such immediate help by laypeople to suddenly ill or injured persons before the arrival of professional medical care is commonly defined as first aid.[4]

First aid comprises assessments and interventions that can be performed by a bystander (or by the victim) with minimal or no medical equipment. It is the first help or treatment provided to the victim of any injury or sudden illness before the arrival of an ambulance or qualified medical care; this is done through the use of facilities and supplies available at the time and site of the incident.[5,6]

School life constitutes an important part of students' life. It has a direct impact on their physical and mental health. School students are highly vulnerable to a number of risks due to their still maturing physical and mental abilities. They are more exposed to the risks of accidents and injuries and hence require first aid

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more often than do adults. Such injuries relating to physical activity can take place during sporting events at school, or while engaging in extracurricular activities organized by the school such as bicycle riding, swimming, and playing games. Nonetheless, the information regarding the true magnitude and patterns of physical activity–related injuries is lacking.[7,8]

Injuries are, by far, the most commonly reported cause of death among students. This emphasizes the importance of first and second levels of prevention from accidents in schools. The prompt provision of appropriate first aid to students immediately after injury constitutes the main secondary preventive measure and may be lifesaving. To be effective, first aid must be provided by trained persons who are in the scene of the accident or close to it.[9]

At schools, the first responsible person to reach an injured student is usually the teacher. However, Başer *et al.* reported that most teachers gave incorrect answers regarding first aid management of epistaxis, bee stings, and abrasion. Since accidents at schools are almost daily incidents, it is likely that the first responsible adult to reach the victim in need would be the "teacher."[9,10]

The school has certain responsibilities when accidents or sudden illness occur. The action to be taken is usually determined by each situation with the individual circumstances of incident. Since first aid is the immediate care provided by nonprofessionals until the professional services are made available, extreme caution needs to be exercised in any emergency care.[11]

School teachers assume responsibilities not only as educators but also as caregivers who must guarantee the safety and well-being of children while at school. In case of any accidents, teachers are usually the first bystanders, which would increase their responsibilities regarding provision of first aid measures to the injured student. As the school health team members may not be available all the time, the teacher is often forced to assume some of their roles. Therefore, teachers should be well-versed in first aid knowledge and skill. However, they may tend to act correctly when faced with incidents of burns, bruises, and fractures, but in case of life-threatening situations, only few would be able to provide the appropriate first aid.[12]

The aim of this study is to assess secondary school teachers' knowledge and practice regarding first aid.

Methodology

This is a cross-sectional descriptive study design. The study population consisted of school teachers at governmental secondary schools in Khamis Mushayt City, Saudi Arabia, with at least 1 year of experience in teaching practice.

Following a simple random sample, the researchers selected the necessary number of secondary schools that fulfilled the desired sample size (i.e. 250 teachers). Within each selected secondary school, all teachers were included in the study.

An anonymous self-administered questionnaire was designed by the researcher based on review of related literature. It included sociodemographic data of the teachers, 25 questions related to first aid measures for management of students with chronic diseases, 12 questions related to teachers' knowledge about first aid management of emergency cases, and teachers' previous practices regarding first aid at school.

A pilot study was carried out on 25 teachers (at two secondary schools other than the selected ones) to assess the applicability of the tool, the feasibility of the study, and the time needed for filling the forms. The study tool was finalized according to the pilot data. The data of the pilot study were not included in the main study sample.

Data collection was carried out during the academic year 2016–2017. Questionnaire forms were handed to teachers after explanation of the aim of the study. Returned questionnaires were checked for completeness and were validated by the researchers.

A teacher's correct answer was assigned a score of "1," whereas an incorrect answer was assigned a score of "0." The percentage of teachers' obtained correct responses to knowledge statements was calculated and then classified into either "knowledgeable" (i.e. ≥50%), or "not knowledgeable" (i.e. <50%).

Collected data were verified and then coded and entered to a personal computer. Statistical Package for the Social Sciences (SPSS version 22) was used for data entry and analysis. Quantitative variables were presented as mean and standard deviation, whereas qualitative variables were presented as frequencies and percentages. For testing the significance of relationships between variables, Chi-square was applied. *P* values less than 0.05 were considered as statistically significant.

Results

Table 1 shows that age of participants ranged from 21 to 55 years. Most participants were between 35 and 45 years of age (57.6%), while 30.4% of participants were less than 35 years and 12% more than 45 years of age. More than half of the participants (56%) were females. Most participants had bachelor's degree (82.8%), while 8.4% had diploma and 8.8% had postgraduate qualifications. About half of the participants (46%) had 10–20 years of experience in teaching, while 40.8% had less than 10 years of experience and 13.2% had more than 20 years of experience.

Table 2 shows that all participants heard about first aid. Their sources of knowledge about first aid were mainly mass media (60.4%) followed by physicians (13.6%) and educational school books (7.6%). Most participants (61.6%) thought that persons who attended training on first aid are the best persons to provide first aid followed by nurses (26.4%) and physicians (6.8%). About one-fourth of the participants (27.2%)

attended training on first aid. Almost one-third of the participants were confident in performing first aid.

The results of this study showed that only 19.6% of participants were knowledgeable regarding first aid (i.e. their knowledge percent scores were ≥50%) [Figure 1].

Table 3 shows that almost half of the participants (48.8%) faced cases that needed first aid, mainly those who lost consciousness (59%), had fits (13.9%), or wounds (13.1%). However, only 54.9% of those who faced cases that needed first aid could provide the necessary first aid.

Table 4 shows that regarding sports' injuries at school, participants' best knowledge items were related to returning back to play after fainting (74.4%) and first aid for an unconscious student (50.8%). On the other hand, worst participants' knowledge items were related to applying ice packs for sport injury victims (8%) and first aid for bleeding wounds (12%).

Table 5 shows that regarding first aid of students with chronic diseases, participants' best knowledge items were related to epilepsy as a type of insanity (93.6%) and diabetic students should have balanced diets (92%). On the other hand, worst participants' knowledge items were related to epilepsy may lead to mental retardation (27.2%) and epileptic students should not practice sports (28.4%).

Table 6 shows that regarding first aid management, participants' best knowledge items were related to fire reaching students' clothes (81.2%) and cut wounds (76.4%). On the other hand, worst participants' knowledge items were related to intra-aural foreign body and insect sting (14.4% each).

Table 7 shows that participants' knowledge grades differed significantly according to their age groups ($P = 0.003$), with better knowledge among older participants. Female participants were significantly more knowledgeable than males ($P = 0.035$). Participants' knowledge grades differed significantly according to their experience in teaching ($P = 0.001$), with better knowledge among more experienced participants. However, participants' knowledge grades did not differ significantly according to their qualification.

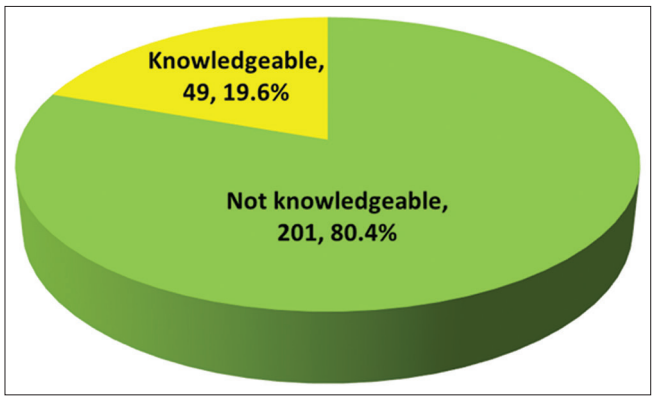

Figure 1: Participants' knowledge grades about first aid

Table 1: Personal characteristics of study sample

Personal characteristics	No.	Percentage
Age groups ()		
<35	76	30.4
35-45	144	57.6
>45	30	12.0
Range (minimum-maximum)	21-55 years	
Gender		
Male	110	44.0
Female	140	56.0
Qualifications		
Diploma	21	8.4
Bachelor degree	207	82.8
Postgraduate	22	8.8
Years of experience in teaching		
<10	102	40.8
10-20	115	46.0
>20	33	13.2

Table 2: Participants' knowledge about first aid

Knowledge about first aid	No.	Percentage
Heard about first aid	250	100.0
Sources of information about first aid		
Mass media	151	60.4
Physicians	34	13.6
Educational school books	19	7.6
Nurses	15	6.0
Others	31	12.4
Who would best perform first aid		
Persons who attended training on first aid	154	61.6
Nurses	66	26.4
Physicians	17	6.8
Teachers	13	5.2
Attending training on first aid	68	27.2
Personal confidence in performing first aid		
Confident	80	32.0
Do not know	102	40.8
Unconfident	68	27.2

Table 3: Participants' characteristics of their practices related to first aid

First aid practices	No.	Percentage
Having faced cases that needed first aid		
No	128	51.2
Yes	122	48.8
Loss of consciousness	72	59.0
Fits	17	13.9
Wounds	16	13.1
Bleeding	5	4.1
Burns	4	3.3
Animal bites	1	0.8
Others	7	5.7
Having performed first aid before	67	54.9

Table 4: Participants' correct responses regarding knowledge statements related to first aid of sport-injured students

Knowledge statements	No.	Percentage
When to apply ice packs for sport injury victims	20	8.0
When would a fainted student return back to play	186	74.4
First aid for sprained ankle	62	24.8
First aid for bleeding wounds	30	12.0
First aid for a trauma leading to missing a tooth	55	22.0
First aid for an unconscious student	127	50.8

Table 5: Participants' correct responses regarding knowledge statements related to first aid of students with chronic disease

Knowledge statements	No.	Percentage
Diabetic students who do not take their medications	159	63.6
Role of insulin in controlling blood sugar	154	61.6
Route of insulin injection	204	81.6
Symptoms of ketoacidosis	178	71.2
Ketoacidosis can be managed at school	109	43.6
Symptoms of hypoglycemia	103	41.2
Hypoglycemia can be managed at school	151	60.4
Diabetic students should have balanced diets	230	92.0
Diabetic students should have a snack at noon	219	87.6
Diabetic students are not allowed to eat candies at school	126	50.4
Epilepsy is a hereditary disease	117	46.8
Epilepsy may lead to mental retardation	68	27.2
Epilepsy is infectious	237	94.8
Epilepsy is a type of insanity	234	93.6
Epilepsy does not need medical treatment	216	86.4
Treatment of epilepsy should not be given daily	203	81.2
Some foods may lead to epilepsy	167	66.8
Emotional problems may lead to epilepsy	124	49.6
Daily stresses may initiate epileptic fits	168	67.2
Epilepsy does not necessitate definite intervention	164	65.6
It is important to keep the student's mouth open during fits	201	80.4
Epileptic students should not practice sports	71	28.4
If not treated, epileptic students have learning problems	72	28.8
During fits, the students should receive water and sugar	167	66.8
To stop the fit the victim should be mildly hit and open his arms	121	48.4

Table 8 shows that participants' knowledge grades about first aid did not differ significantly according to their sources of information, their opinion regarding who would best perform first aid, attending training on first aid, or their confidence in doing first aid.

Table 9 shows that participants' knowledge grades about first aid did not differ significantly according to their previous experience with cases that needed first aid.

Discussion

School children spend at least one-third of their times in schools, where they are usually at risk of injuries and medical emergencies. School teachers are the guardians of these students as long as they are in the school and need to be equipped with adequate knowledge about first aid practices. Therefore, it is essential for teachers to be trained in first aid procedures and to be updated in their knowledge and skills regarding first aid guidelines.[13-15]

This study showed that knowledge of secondary school teachers in Khamis Mushayt City regarding first aid was quite unsatisfactory. Only 19.6% of the participating secondary school teachers were knowledgeable regarding first aid.

This finding is in agreement with several studies that demonstrated the unsatisfactory scores regarding first aid knowledge, as reported by Al-Samghan *et al.*, in Abha, Saudi Arabia, who concluded that knowledge of school teachers regarding first aid was not satisfactory. Ali *et al.*, in Egypt, also reported that poor scores were obtained by school teachers on knowledge of first aid. Moreover, Başer *et al.*, in Turkey, reported that most teachers did not have enough knowledge about first aid. In Baghdad, Iraq, Al-Robaiaay found that regarding school teachers' knowledge about first aid, only 4% had good knowledge, 19% had fair knowledge, and 77% had poor knowledge.[9,16-18]

Regarding sports' injuries at school, this study showed that participants' best knowledge items were related to returning back to play after fainting and first aid for an unconscious student, while their worst knowledge items were related to applying ice packs for sport injury victims and first aid for bleeding wounds.

Different findings were reported by Al-Samghan *et al.*[16] in Abha, Saudi Arabia, who found that most school teachers knew correctly how to deal with cases of sports injury (80.7%), cut wound (79.1%), and bleeding (52.4%), while only 43.3% and 37.4% knew how to deal with cases of sprains and dental injuries, respectively, and 61.5% knew correctly how to manage a case of fall with suspected fractures.

The discrepancy between the two studies can be due to time difference and/or study population difference. The former is likely to be the reason because of absent structural training in first aid, which will lead to variable performance over time, and the latter is unlikely to be the reason because of the overt similarities between studies' populations.

Regarding first aid of students with chronic diseases, this study revealed poor knowledge among teachers, especially regarding epilepsy. These findings are in agreement with those of Dantas *et al.*, who noted that although seizures and epileptic fits are serious emergencies that may strike school children, many teachers are misinformed about the characteristics of these seizures. Millogo and Siranyan, in Burkina Faso, found that most teachers were not satisfied with their knowledge about epilepsy.[19,20]

Greenhalgh noted that teachers have a significant lack of understanding of child health issues, with a particularly poor level of knowledge about diabetes mellitus and its management. Moreover, Tatman and Lessing showed that only 25% of the teachers had adequate understanding of diabetes, with little knowledge about its symptoms and signs, treatment of emergency diabetic problems, and diet-related issues. In Bahrain, Alnasir demonstrated deficient knowledge about diabetes among school teachers.[21-23]

However, in Abha, Saudi Arabia, Al-Samghan *et al.* found that 48% of teachers had satisfactory knowledge about epilepsy. It is to be noted that several studies focused on students' medical conditions, especially chronic diseases (e.g. asthma, allergic diseases, epilepsy), for which almost 82% of these attacks occur in children of school age and that most of the attack-related deaths have occurred in schools.[16,24]

This study showed that regarding first aid management, participants' best knowledge items were related to fire reaching students' clothes and cut wounds. On the other hand, worst participants' knowledge items were related to intra-aural foreign body, poisoning, and insect stings.

These findings are in agreement with those of Al-Samghan *et al.*, in Abha, who reported that 63.1% knew how to care for scald burn, 70.1% knew correctly how to care for a child on fire, 67.9% knew correctly how to manage a case with foreign body in the ear, 68.4% knew correctly how to manage asphyxiated children who swallowed foreign bodies, while only 39% and 24% of them knew correctly how to manage a case with foreign body in the eye and nose, respectively. Only 17.6% of teachers knew how to manage correctly a case of insect sting, while 26.2% knew properly how to take care of a case of swallowing poisonous material.[16]

The results of this study showed that the main sources of teachers' knowledge about first aid were mainly mass media followed by physicians and educational school books. About one-fourth of the participants (27.2%) attended training on first aid. Almost one-third of the participants were confident in performing first aid. Moreover, 48.8% of teachers faced cases that needed first aid, mainly those who lost consciousness, had fits, or wounds. Only 54.9% of those who faced cases that needed first aid provided first aid to the encountered victims.

The main sources of knowledge about first aid among teachers in this study were mass media (60.4%), followed by physicians (13.6%) and educational school books (7.6%).

This finding demonstrates that although only some participant teachers were previously trained on first aid, more than half of them had administered first aid in real-life situations. This indicates that participant teachers are willing to help and have positive attitudes toward first aid, despite not being trained.

Similarly, Al-Samghan *et al.* reported that 28.3% of teachers attended training courses on first aid. Moreover, 76.3% of teachers obtained their information from media, while 24.2% reported that the source

Table 6: Participants' correct responses regarding knowledge statements related to first aid management of emergency cases at school

Knowledge statements	No.	Percentage
Cut wound	191	76.4
Burns	119	47.6
Fire reaching students' clothes	203	81.2
Prodrome of epileptic fits	77	30.8
A foreign body in the eye	88	35.2
Intranasal foreign body	95	38.0
Intra-aural foreign body	36	14.4
Suffocation after swallowing a foreign body	178	71.2
Ingestion of a toxic substance	129	51.6
Epistaxis	87	34.8
Suspected hand fracture	148	59.2
Insect sting	36	14.4

Table 7: Participants' knowledge grade regarding first aid according to their personal characteristics

Personal characteristics	Not knowledgeable		Knowledgeable		*P*
	No.	Percentage	No.	Percentage	
Age groups (years)					
<35	68	89.5	8	10.5	
35-45	115	79.9	29	20.1	
>45	18	60.0	12	40.0	0.003
Gender					
Male	95	86.4	15	13.6	
Female	106	75.7	34	24.3	0.035
Qualifications					
Diploma	16	76.2	5	23.8	
Bachelor degree	163	78.7	44	21.3	
Postgraduate	22	100.0	0	0.0	0.051
Years of experience in teaching					
<10	82	80.4	20	19.6	
10-20	100	87.0	15	13.0	
>20	19	57.6	14	42.4	0.001

Table 8: Participants' knowledge grade regarding first aid according to their knowledge about first aid

Knowledge about first aid	Not knowledgeable		Knowledgeable		*P*
	No.	Percentage	No.	Percentage	
Source of information on first aid					
Mass media	122	80.8	29	19.2	
Physicians	28	82.4	6	17.6	
Educational books	15	78.9	4	21.1	
Nurses	11	73.3	4	26.7	
Others	25	80.6	6	19.4	0.963
Who would best perform first aid					
Trained persons	128	83.1	26	16.9	
Nurses	53	80.3	13	19.7	
Physicians	11	64.7	6	35.3	
Teachers	9	69.2	4	30.8	0.221
Attending training on first aid					
Yes	51	75.0	17	25.0	
No	150	82.4	32	17.6	0.189
Confidence in doing first aid					
Confident	63	78.8	17	21.3	
Do not know	77	75.5	25	24.5	
Unconfident	61	89.7	7	10.3	0.066

Table 9: Participants' knowledge grade regarding first aid according to facing cases that needed first aid

	Not knowledgeable		Knowledgeable		*P*
	No.	Percentage	No.	Percentage	
Facing cases that needed first aid					
Yes	92	75.4	30	24.6	
No	109	85.2	19	14.8	0.052

of their information was physicians and school books were the source of first aid information among 19.4% of teachers.[16]

This study showed that teachers' knowledge grades differed significantly according to their age groups, with better knowledge among older participants. Female participants were significantly more knowledgeable than males. Teachers' knowledge grades also differed significantly according to their experience in teaching. However, their knowledge grades did not differ significantly according to their sources of information, their opinion regarding who would best perform first aid, attending training on first aid, their confidence in doing first aid, or their previous experience with cases that needed first aid.

Kumar *et al.* reported that in Mysore, India, teachers with work experience of more than 10 years were found to have significantly better knowledge about first aid. Joseph *et al.*, in India, reported that teachers' knowledge about first aid management approached significance and was greater among teachers previously trained in first aid. It was also significantly greater among teachers who had first aid training within 1 year. Pandey *et al.* reported no significant differences in teachers' knowledge about first aid according to their sociodemographical characteristics.[14,15,25]

Al-Samghan *et al.* reported that teachers' first aid knowledge was not statistically associated with their personal characteristics. There were no statistically significant differences in teachers' knowledge regarding attending training courses on first aid. This finding may indicate the importance of upgrading and improving the information included in school books, so as to improve both students' and teachers' knowledge related to first aid.[16]

In conclusion, secondary school teachers in Khamis Mushayt City are aware of first aid. Their main sources of knowledge are mass media, physicians, and educational school books. Most teachers are not trained on first aid, and about two-thirds are confident in performing first aid. About half of the teachers face cases that need first aid, but only half of them provide the necessary first aid. Only one-fifth of the teachers are knowledgeable regarding first aid. Significantly more knowledgeable teachers were those who are older, females, and more experienced in teaching.

Therefore, it is necessary that knowledge gaps among secondary school teachers (e.g. those related to sports' injury at school and management of epileptic children) be covered, and practical training of secondary school teachers on first aid is to be fulfilled, especially by doctors and nurses.

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Conflicts of interest

There are no conflicts of interest.

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