

First-Aid Knowledge and Attitudes of Schoolteachers in Saudi Arabia: A Systematic Review

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Purpose: Schoolteachers are the main people to provide first aid in cases of health-related emergencies during school hours. In this review, we aimed to synthesize teachers' knowledge and attitudes about first aid in Saudi schools.

Methods: This systematic review was carried out in line with The Preferred Reporting of Items for Systematic Reviews (PRISMA) guidelines. PubMed (via MEDLINE), CINAHL, and the Cochrane databases were searched between January and March 2021. Studies were eligible for inclusion if they were (1) published in English, (2) conducted in school-based settings, (3) involved schoolteachers in Saudi Arabia, and (4) investigated first-aid knowledge and practice or assessed the effects of first-aid training interventions. The methodological quality was assessed using the Joanna Briggs Institute Critical Appraisal Checklist for Cross Sectional Studies.

Results: A total of 15 studies were considered for this review with a total of 7266 schoolteachers. The majority of the included studies were of good quality. Most studies showed that teachers had inadequate knowledge of health-related emergencies in schools. Fourteen cross-sectional studies and one interventional study related to Saudis schoolteachers' first-aid knowledge and attitudes were included. Most of the participants had a supportive attitude toward students with health-related issues and were willing to attend first-aid training.

Conclusion: As a result of teachers' inadequate knowledge of first aid, accessible training packages for schoolteachers and administrators should be developed. Further interventional studies that include both male and female teachers, use validated tools, and include wider regions of Saudi Arabia are strongly recommended.

Keywords: schoolteachers, trauma, first aid, education, knowledge, attitudes, systematic review

Introduction

Injuries are the main cause of death among school students and the leading cause of early morbidity and mortality.¹ At schools, where students spend a considerable amount of their day,² children are vulnerable to a variety of ailments and traumas that necessitate first aid.³ According to the American Academy of Pediatrics, 10–25% of the United States (US) children's accidents occur during school hours.^{4,5} Research has identified three main areas related to first-aid injuries at school: (1) health problems and accidents; (2) teachers' knowledge of first aid; and (3) the benefits of first-aid training programs for school staff. School students' health problems include epileptic seizures,⁶ diabetes, asthma attacks, sudden cardiac death,^{7,8} dental trauma,^{9–11} leg injuries, and nosebleeds.¹²

Teachers' knowledge of first aid has been investigated globally and in Saudi Arabia in limited studies. In schools, students spend most of their time under the supervision of their teachers. Accordingly, the teachers are the main people called upon to deal with urgent health care requirements during school hours. Therefore, they should be capable of providing first aid in cases of health-related emergencies.^{13,14} However, there is limited evidence on the knowledge and practice of basic first aid among schoolteachers and people in the community.¹⁵ Therefore, it is vital to provide schoolteachers with information and skills regarding basic first aid.^{16,17} Research on teacher training in schools found

that good first-aid training resulted in a significant improvement in the teachers' knowledge of first aid, potentially reducing injuries and saving lives.¹⁸ However, most of these studies were conducted in countries with different systems and environments to those in Saudi Arabia.

There were over 6.4 million students registered in Saudi schools as of 2019. Nonetheless, there is no state legislation requiring schoolteachers or other personnel to be certified in first aid. The Saudi government is putting a great effort into improving health education and first aid.¹⁹ However, rather than schoolteachers, these health-related training programs are aimed at medical students. Consequently, safety in the school environment may be affected. Moreover, there is a lack of clarity about what constitutes first aid and its practices in Saudi schools, with no comprehensive evidence on this manner. Thus, the aim of this systematic review was to explore the available evidence on first aid involving schoolteachers. Our research questions were, "What evidence is available about first-aid practices among schoolteachers in Saudi Arabia?" and "Does teachers' knowledge meet the first-aid needs in Saudi schools?"

Materials and Methods

In this study, the systematic review protocol pre-defined the objectives, methodology, and reporting, allowing for transparency throughout the process. The Preferred Reporting of Items for Systematic Reviews (PRISMA) was used as a guide to conduct the review ([Appendix I](#)).²⁰

Eligibility Criteria

The inclusion criteria were determined following the guidance of the Joanna Briggs Institute's (JBI) reviewers' manual for reviews assessing mixed-methods data.²¹ Studies were eligible for inclusion if they were (1) published in English, (2) conducted in school-based settings, (3) involved schoolteachers in Saudi Arabia, and (4) investigated first-aid knowledge and practice or assessed the effects of first-aid training interventions. We considered all evidence types (systematic reviews, randomized controlled trials, cross-sectional studies, case-control studies, case series, cohort studies, qualitative studies, and other reviews). To be specific to our study group of interest, we excluded studies related to first-aid knowledge and practice at universities or medical-based settings.

Information Sources

A scoping search of MEDLINE database was carried out in December 2020 as an initial step to pilot the search terms relevant to this review. To guarantee a thorough search of the literature, we searched PubMed (via MEDLINE) PubMed, CINAHL, EMBASE, and the Cochrane database. The searches were undertaken between January and March 2021.

Search Strategy

The PRISMA-Search Reporting Extension (PRISMA-S) was used to ensure the search strategy covered the review question appropriately.²² A combination of Medical Subject Headings (MeSH) and Boolean search strategy with relevant text words to allow for systematic search strategy. For the search of each electronic database, we used the same methods and search terms. The following search terms were used: teacher, first aid, knowledge, and attitude, school-based training, and Saudi Arabia. [Appendix II](#) shows a detailed information about our search strategy. The reference lists of included studies and any relevant systematic reviews were checked manually to identify additional eligible studies.

Selection of Studies

All studies from the database searches were imported into Endnote X9 and deduplicated. The title and abstract of each citation were screened according to the eligibility criteria independently by two reviewers (MA and SA). Then, full-text screening was carried out independently by two reviewers (MA and SA), and disagreements were resolved at respective screening stages by consensus or involving a third reviewer (AH) and reasons for exclusion were recorded.

The Methodological Quality of Individual Studies

For studies included in the review, the methodological quality was assessed by the reviewer (MA) using the JBI Critical Appraisal Checklist for Cross Sectional Studies, which contains eight questions.²³ Methodological quality of studies was assessed in relation to sampling strategy, data collection and statistical analysis. Studies that scored “Yes” to four of the eight questions (50%) were deemed of good quality.

Data Extraction

A data extraction form was developed and piloted to extract data for each eligible study. It included authors’ details, study collection dates, settings, teachers’ qualifications and years of experience, school levels, age, gender, sample size, study design, medical issues (regarding first-aid provision), proportion of teachers who have undergone first-aid training, and main outcomes. Two reviewers (MA and AH) extracted the data independently. Any discrepancies were discussed and resolved with a third reviewer (SA). Authors of studies were contacted to clarify any missing data relevant to our review.

Data Synthesis

A summary of the findings was placed in [Table 1](#). A narrative synthesis outlining the findings was conducted, seeking to explain the evidence available and identify gaps in the literature.

Results

Study Selection

[Figure 1](#) summarizes the search and selection process regarding the evidence used in this review. A total of 90 records were initially identified. Of which, 50 were duplicates and excluded. Of the remaining 40, 13 articles were excluded after title and abstract screening. The remaining 27 were retrieved for full-text review. Fifteen of these articles met the eligibility criteria and were included in this review.

Characteristics of the Studies

[Table 1](#) summarizes the characteristics of the included.^{24–38} Fourteen cross-sectional studies and one interventional study related to schoolteachers’ first-aid knowledge and practice were identified. All studies were conducted in Saudi Arabia: five in Riyadh,^{24–28} one in Jeddah,²⁹ three in Khamis Mushayat and Abha,^{30–32} two in Makkah,^{33,34} one in Dammam,³⁵ one in Arar,³⁶ one in Hail,³⁷ and one in Unaizah in the Qassim area.³⁸ The number of schoolteachers involved in these studies ranged from 100 to 1520, giving a total of 7266. Most studies (n=8) involved mixed-gender samples, three studies involved only males, and two studies involved only females. Two studies did not report the gender distribution of the teachers. The age range for most of the included studies was 20–60 years. Four studies did not report the teachers’ ages.

The Methodological Quality of Individual Studies

A summary of the critical appraisal of included studies is shown in [Table 1](#). The majority of the studies were of good quality (ie, critical appraisal score >50%). The average score was 72%. As the table illustrates, nine articles scored above the average score with scores ranging from 75% to 100%. One article was a review in which the critical appraisal tool was not applicable.³⁴

Narrative Synthesis of Evidence

The six cross-sectional studies on epilepsy first-aid knowledge and skills reported that most teachers had low-to-moderate knowledge about epilepsy management regarding students experiencing seizures.^{28–30,34,36,38} In a recent study (2021) by Kanjo et al in Jeddah of 822 teachers, showed that approximately 14% had poor knowledge of epilepsy.²⁹ Regarding seizure first aid, participants answered questions assessing their responses during and after a seizure correctly, although the majority did not receive first-aid training.²⁹ Interestingly, a study by Alqahtani in Khamis Mushayat found that more than half (64.1%) of the teachers who had witnessed seizures among students were unable to administer first aid and

Table 1 Summary of Studies on First-Aid Knowledge Among Schoolteachers in Saudi Arabia

Reference	Area	Age Range (Years)	Gender	Sample Size	Medical Problems	School Levels	Teachers' Qualifications and Years of Experience	First-Aid Training	Study Design	Main Outcomes	Critical Appraisal Score
Al-Kubaisy et al (2019) ²⁴	Riyadh	20–55	M/F	1073	Nosebleeds	Kindergarten, primary, intermediate, and secondary	Not reported	68%	Cross-sectional	One-third of teachers had good knowledge about nosebleed management (especially those who had previous information regarding first aid for nosebleeds).	75%
Kanjo et al (2021) ²⁹	Jeddah	20–60	M/F	822	Epilepsy	Primary and secondary	Bachelor: 92% Master: 7% PhD: 1% Experience: ≤5 y: 5.4% 6–10 y: 13.4% ≥10 y: 81%	11%	Cross-sectional	Teachers' knowledge about epilepsy was moderate. Approximately one-tenth had received first-aid training.	75%
Alqahtani (2015) ³⁰	Khamis Mushayat	Not reported	Male	315	Epilepsy	Elementary and intermediate	Not reported	35.9%	Cross-sectional	72.7% of the teachers had witnessed epileptic fits but their knowledge and training regarding first aid was low.	63%
Alkhotani and Alkhotani (2022) ³³	Makkah	Not reported	Female	259	Epilepsy	Primary	Bachelor: 97.7% Master: 62.3% Experience: 6–10 y: 36.3% >10 y: 53.3% 1–5 y: 10.4%	4.2%	Interventional	Health education programs resulted in significant improvements in teachers' responses to seizures and improvements in all aspects of epilepsy awareness.	88%
AlYahya et al (2019) ²⁵	Riyadh	20–60	Male	436	General accidents	Not reported	Bachelor: 72.5% Master: 19% PhD: 2.1% Diploma: 6.4% Experience: >15 y: 43.8% 5–15 y: 15.4%	26.4%	Cross-sectional	Teachers' knowledge about first aid was low (but it was higher among older teachers and those who received training).	50%
Zakirulla et al (2011) ³²	Abha	Not reported	Not reported	100	Dental trauma	Not reported	Not reported	15%	Cross-sectional	The majority of teachers had little knowledge about traumatic dental injury management. They were eager to attend training.	25%
Al-Qahtani et al (2019) ³⁶	Arar	20–50	M/F	404	Epilepsy	Not reported	Bachelor: 75% Master: 9.7% Diploma: 14.6% Experience: >10 y: 43% 5–10 y: 23.8% ≤5 y: 30.2%	0%	Cross-sectional	Teachers' knowledge and practices regarding epilepsy management were poor.	75%

Al-Khalifa and AlYousef (2022) ³⁵	Dammam	Not reported	M/F	398	Dental emergencies	Intermediate	Experience: Mean±SD: 9.11±5.8 y Range: 1–32 y	30%	Cross-sectional	Teachers' knowledge about dental emergencies and their management was poor. They were eager to attend first-aid training.	100%
Aljehani (2019) ³⁴	Makkah	20–60	F	247	Epilepsy	Elementary	Bachelor: 81.4% Master: 6.9% Diploma: 11.7% Experience: >10 y: 13% 6–10 y: 38.8% ≤5 y: 16.2% >15 y: 32%	24.7%	Cross-sectional	Teachers' awareness and knowledge about epilepsy first aid were not satisfactory.	88%
Alsadhan et al (2018) ²⁶	Riyadh	20–60	M/F	1520	Soft tissue injuries	Primary	Bachelor: 71.3% Master: 7.2% Diploma: 21.4% Experience: >10 y: 13% 6–10 y: 13% ≤5 y: 16.2% >15 y: 17.8% 16–20 y: 18.4% 21–30 y: 25.3%	Not reported	Cross-sectional	Teachers' knowledge about traumatic dental injuries was low.	100%
Eroje et al (2021) ³¹	Abha	Not reported	M	191	Oral injuries	Intermediate	Not reported	Not reported	Cross-sectional	Teachers' knowledge about emergency oral injury management was inadequate.	63%
Mansour et al (2019) ³⁸	Unaizah in the Qassim area	26–50	Not reported	315	General emergencies, diabetes, and epilepsy	Primary	Bachelor: 77.3% Master: 2.9% Diploma: 19.4% Experience: 10–20 y	45.2%	Cross-sectional	Teachers' knowledge and education about dental emergencies appeared to be not a problem.	38%
Al-Obaida (2010) ²⁷	Riyadh	20–60	M/F	277	Dental emergencies	Primary	Experience: ≤5 y: 36.1% 5–10 y: 23.3% >10 y: 41.6%	17.8%	Cross-sectional	Teachers' knowledge and awareness about dental emergencies were insufficient.	75%
Aleid et al (2020) ²⁸	Riyadh	20–60	M/F	305	Epilepsy	Primary and secondary	Experience: 5–15 y	11.2%	Cross-sectional	Teachers' knowledge and attitudes about first aid were acceptable	Not applicable
Alshammari (2021) ³⁷	Hail	Mean: 39±7.8	M/F	604	Epilepsy	Primary and secondary	Not reported	48.8%	Cross-sectional	Teachers' knowledge and attitudes about first aid were good.	75%

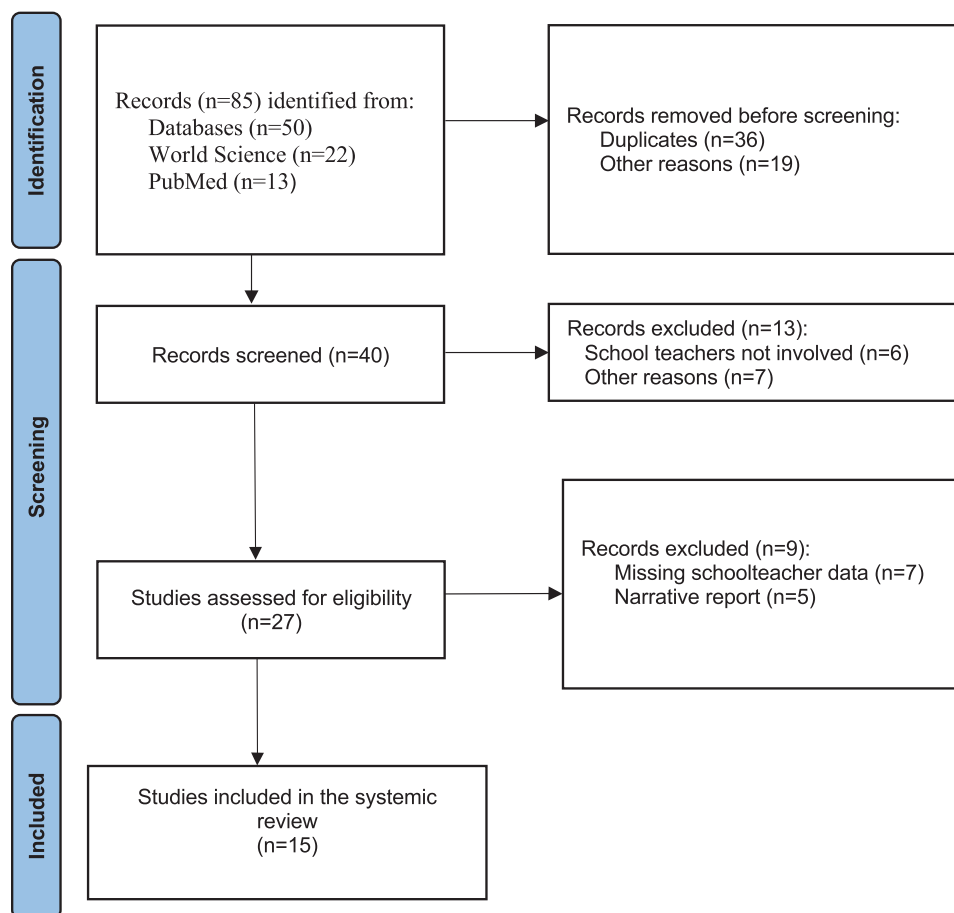


Figure 1 PRISMA flow diagram for study selection process.

Notes: PRISMA figure adapted from Page MJ, Moher D, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ*. 2021;372:n160. Creative Commons.²⁰

54.6% said they were scared when they were present while someone had a seizure.³⁰ In a study by Al-Qahtani et al in Arar (North of Saudi Arabia), although 38.9% of the teachers knew the treatment for epilepsy, teachers' knowledge and practice on epilepsy management were quite low.³⁶ In a study by Aljehani in Makkah, only 39.3% of the teachers (n=247) had first-aid knowledge about epilepsy; 59.1% knew that after the seizure has completely stopped and the patient has regained consciousness, the best first-aid action is to call the parents and have them take the student home, but only 21.5% knew that if the epileptic seizures persisted, they should call an ambulance to take the patient to hospital.³⁴

In a study by Mansour et al in Unaizah in the Qassim area, three-quarters of the teachers knew what to do if a student fainted.³⁸ Although 44.2% of the teachers had received first aid training, only 22.3% were confident in their ability to provide first aid.³⁸ Similarly, a study by Aleid et al in Riyadh (n=305) found similar outcomes to the Qassim area study.²⁸

Regarding teachers' attitudes, in general, most teachers had a supportive attitude toward students' health-related challenges as well as students with medical issues.^{36,37} For example, in the study by Aleid et al in Riyadh, most teachers were supportive regarding children experiencing seizures, with 89.4% of them allowing their children to sit and play with a child who has seizures.²⁸ In the included studies, teachers were willing to receive training to help them to cope with emergencies in school.

As for teachers' training, first-aid training (including the health-related injuries involved) varied greatly among studies. In three studies,^{24,37,38} 45–68% of the teachers had received first-aid training. However, other studies found that only about 15% of the teachers had received first-aid training,^{29,32,33} while others found that around 40% of the teachers had received first-aid training.

Discussion

The focus of this systematic review is on teachers' knowledge and attitudes about first aid in schools.

In this review, we found low levels of knowledge of first aid among schoolteachers in Saudi Arabia. Similarly, a systematic review and meta-analysis which evaluated the knowledge and attitudes of teachers concerning dental trauma first-aid worldwide, found that teachers had inadequate knowledge of initial management of dental trauma.³⁹ Despite the fact that this is focused on dental trauma and our review is on first aid, the outcomes show that there is not enough knowledge on initial management of any injury by teachers. It also indicates that the teachers' low first-aid knowledge is a global issue and should be addressed at a global level.³⁹ Moreover, we also found that teachers' attitudes regarding providing first aid for students in their schools were positive. This was similar to a study focused on secondary schoolteachers in Saudi Arabia which showed that participant teachers were willing to help and provide first aid, despite not being trained.⁴⁰ In addition to enhancing learning capabilities, teachers' positive attitudes facilitate their willingness to attend first-aid training, as most included studies showed that teachers were eager to receive first-aid training. However, possible explanations for most teachers' lack of training are lack of accessibility and lack of requirement for teachers to undergo training. Although included studies recommending training, there were no information on the contents, length, teaching mode, or who should provide it. In many western countries (for example, in the US), teachers' first-aid training is mandatory, and it is a requirement for obtaining a teaching license.

There is an absence of comprehensive regulations and policies in Saudi Arabia on teachers' first-aid training, and this review indicated the importance of that training. As there is a lack of health care personnel in schools and ambulances may arrive late to emergencies, teachers need to be able to provide first-line care to students with health emergencies in schools. Consequently, it is vital to provide schoolteachers with repeated effective training on first aid.

This study is the first systematic review on health issues requiring first aid in schools and covers most geographical areas of Saudi Arabia. However, the outcomes should be treated with caution prior to translating them into practice. These limitations involve the study designs including (eg, cross-sectional observational studies that analyzed data from a population at a single time point) and the use of non-validated questionnaires.⁴¹

Conclusion

At the national level, the Saudi Ministry of Education and Ministry of Health, and other related organizations, should provide effective first-aid training programs for schoolteachers and administrators. Additionally, they should require all teachers to participate in this training to obtain a license to teach. Moreover, clear guidelines to help school staff deal with emergencies should be provided. At the school level, teachers should update their knowledge by attending first-aid training regularly and adhering to the emergency management guidelines. Each school should develop a first-aid kit with appropriate supplies and prepare students to deal with emergencies. In this process, consultations with professionals who provide first aid (such as paramedics and emergency medicine doctors who work in local hospitals and with the Saudi Red Crescent Authority) would be of great value. Further interventional studies on first aid in schools, involving both male and female teachers, using validated tools, and including wider regions of Saudi Arabia, should be conducted, particularly regarding first aid for students with emergencies related to diabetes, menstruation issues, and asthma and in schools that support students with disabilities.

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