

Awareness of school teachers about students common emergencies during school time in the eastern region, Saudi Arabia: A cross-sectional study

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ABSTRACT

Background: Schools have to ensure student safety and well-being. However, medical emergencies involving injuries are common, requiring teachers to provide prompt first aid before professional care arrives. This study assessed knowledge and awareness of first aid among school teachers to identify areas needing improvement. **Methods:** This cross-sectional study surveyed 371 teachers from the eastern region primary schools using a standardized questionnaire assessing first aid knowledge across areas like bleeding control, fractures, seizures, choking, and burns. Demographic factors were analyzed for correlations with knowledge levels. Pearson's Chi-square tests analyzed bivariate relationships comparing correct knowledge identification percentages across teacher sociodemographic. The level of statistical significance was at a P value <0.05 across tests. **Results:** Only 157 teachers felt able to appropriately handle medical emergencies. Major knowledge gaps existed regarding airway obstruction and chemical injuries, with 168 unable to identify correct responses for choking first aid and 105 unsure of chemical burn management steps. Appropriate fracture management was lacking, with just 70 correctly endorsing nose pinch for nosebleeds. Cardiopulmonary resuscitation knowledge was inadequate, with 57 of teachers unaware of the basics. Teachers demonstrating higher knowledge levels overwhelmingly had prior first aid training (153, 66.5%) compared to untrained counterparts (89, 63.1%). **Conclusion:** The study revealed poor first aid knowledge among elementary school teachers for effectively managing child emergencies. Strategies enhancing delivery must address barriers around training access, knowledge attrition, and variability in baseline skills through sustainable system-wide policies applied nationally. Fulfilling schools' ethical obligations toward maintaining student safety requires urgent reforms to bolster emergency preparedness.

Keywords: Awareness, first aid and Saudi Arabia, knowledge, school teachers

Introduction

Schools have an essential responsibility to ensure student well-being and ability to thrive academically within a safe environment.^[1] However, the school setting poses an inherent risk for injuries and medical emergencies in children who require

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How to cite this article: Alruwaili A, Al Sulaiteen H, Alanazy A, Almousa Z, Alshaqaiq M, Alhofufi A, et al. Awareness of school teachers about students common emergencies during school time in the eastern region, Saudi Arabia: A cross-sectional study. *J Family Med Prim Care* 2024;13:3059-66.

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Received: 14-12-2023

Revised: 16-02-2024

Accepted: 19-02-2024

Published: 26-07-2024

Access this article online

Quick Response Code:



Website:
<http://journals.lww.com/JFMPC>

DOI:
10.4103/jfmpe.jfmpe_1954_23

prompt first aid assistance before professional care can arrive.^[2] Data shows that from 3% to 30% of injuries from accidents in the pediatric population occur within educational institutions, frequently on playgrounds or involving falls and collisions during physical activities.^[3-5] Implementation of standardized safety precautions can minimize hazards, yet complete prevention of all injuries remains impossible.^[6] Equipping teachers with comprehensive first aid certification and knowledge allows for timely interventions when confronting medical crises among students.^[7]

Despite the clear need for emergency preparedness, studies demonstrate that many schools do not prioritize adequate student safety measures or staff first aid training.^[8,9] As those most consistently present during school hours, teachers routinely serve as first responders when children experience health issues or injuries. However, research indicates poor retention of first aid skills among both pre-service and current schoolteachers, requiring ongoing reinforcement through routine retraining programs to remain effective care providers.^[10,11] Even teachers expressing high motivation for first aid preparedness self-report a lack of confidence in their actual ability to implement appropriate interventions across basic areas like bleeding control, fractures, seizures, choking, shock, or burns.^[12] Such a deficient understanding of core emergency response principles can delay necessary treatments when seconds count most to prevent further harm. Literature also suggests variance in teacher first aid knowledge and retention based on previous training background, teaching level, age, gender, and years of experience warranting investigation within specific educational contexts.^[9,10] Yet, few studies have thoroughly examined teacher emergency preparedness among Middle Eastern school systems.^[8-11]

In the Kingdom of Saudi Arabia, no universal guidelines currently mandate practical first aid skills training or assessment across teachers in either private or public school sectors.^[13] While the Saudi Red Crescent Authority offers generalized community and workplace first aid programs, they remain elective and dependent on institutional budget priorities rather than enforced government policy.^[14] The resulting gaps in baseline understanding create substantial vulnerabilities in the ability to mitigate avoidable harm among students experiencing medical crises. Investigating first aid knowledge and awareness can help identify specific areas needing improvement through mandatory certifications, routine retraining policies, increased school nurse resources, and widely accessible first aid equipment.^[15,16] Improving preparedness to handle emergencies like choking, fractures, burns, bleeding control, or anaphylaxis can also inform targeted educational interventions addressing context-specific issues to better safeguard children when at school.^[17,18]

This study aimed to assess current knowledge and awareness of first aid for managing common medical emergencies among elementary school teachers within the eastern region of Saudi Arabia. Additionally, it explored potential correlations between

teacher demographic factors and the ability to correctly identify emergency response protocols across diverse injury scenarios.

Methods

Study design and setting

This cross-sectional questionnaire-based study was conducted in the eastern region of Saudi Arabia between June 2023 and October 2023. The eastern region houses over 2000 public and private primary schools under the administration of the Ministry of Education, representing an ideal setting to evaluate first aid knowledge among teachers.

Study participants

The target population included both male and female teachers currently employed at primary public or private schools educating students from grades 1 through 6 in the eastern region. Schools were selected by convenience sampling within the eastern region based on accessibility and administrator approvals to participate. All teachers present from chosen schools during scheduled data collection days were invited to voluntarily complete the study questionnaire without exclusions based on age, years in profession, educational qualifications, or prior first aid experience. Administrators and non-teaching school staff were excluded.

Sample size calculation

The sample size was calculated using Cochran's formula for categorical data, with 5% margin of error and 95% confidence interval. Based on the eastern region statistics of about 28000 total primary school teachers,^[19] the minimum representative sample size was determined to be 351 teachers.

Study instrument and data collection

Data was collected using a standardized close-ended questionnaire adapted from published literature around first aid knowledge assessments in school teachers.^[8,10,11] Questions captured key sociodemographic details, prior first aid training status, experience with student medical emergencies requiring first aid over a teaching career, and knowledge regarding proper emergency response protocols for situations like choking, bleeding, fractures, seizures, and burns with pictorial depictions to enhance clarity. Content validity of the instrument was established through expert reviews by family medicine and emergency medicine consultants while reliability was determined through 2 weeks of test-retest pilot administration in 20 teachers showing 87% concordance in responses. After taking informed written consent, the final questionnaire was then self-administered to eligible participants. Collected data was deidentified using codes and kept confidential throughout the analysis. The ethical approval was obtained from King Abdullah International Medical Research Center (KAIMRC) before conducting of this study (IRB/0567/23).

Statistical analysis

Data was compiled, and statistical analysis was conducted using SPSS version 22 software. Teacher demographical variables

were expressed as frequencies and percentages. Knowledge question responses around interventions for various medical emergencies were similarly categorized. Pearson's Chi-square tests analyzed bivariate relationships comparing correct knowledge identification percentages across teacher sociodemographic. The level of statistical significance was set at a *P* value <0.05 across tests.

Results

After data were extracted from the survey, it was revised, coded, entered, and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). Based on inclusion and exclusion criteria for the study data to measure the awareness of school teachers about student's common emergencies during school time in the eastern region, the number of people who agreed to participate and completed the questionnaire was 371 (a response rate of 100%) and was included for statistical analysis.

With regard to age distribution, 172 (46.4%) and 199 (53.6%), of the study participants were found between the ages of <40 years and >40 years, respectively. The mean age of the teachers was (41.88 ± 8.78) years. Female participation in survey was (55.5%) compare to males (44.5%). More than half 290 (78.2%) of the elementary school teachers were bachelor's degree holders while 16.8% were having higher education. The mean professional working experience was (20.23 ± 2.57) years and 30.7% worked for more than 20 years followed by 10–20 years of working experience. A majority of the teachers had been worked in public schools (80.9%). As per participants' self-report, social media were mentioned as a main source of information by 168 (40.8%) participants. There was a statistical significant difference in the level of knowledge score of schoolteachers in dealing with common emergencies by gender and their type of school in which they are working. The mean knowledge score of <40 years of aged, males' teachers are more knowledgeable than females significantly higher than other categories. Higher education level of teachers and more than 20 years of experienced teachers are more knowledgeable than other categories. The mean level of knowledge acquired from educational books and different type of course they participated. The detailed information about the demographic characteristics and level of knowledge score of school teachers in dealing with common emergencies among the study participants in Table 1.

Table 2 revealed about knowledge aspect of the first aid among the study respondents, majority of teachers (97%) were heard about the term first aid. Most of the study participants reported that sources of information for improving the knowledge of first aid were from social media (40.8%), television (27.9%), and educational books (25.0%). Most of the participant teachers (51.5%) in our study knew about first aids while 48.5% overall school instructors lack first aid knowledge. 76.3% agreed that knowledge about first aid for the schoolteachers in dealing with common emergencies is mandatory. About 55% of teachers participated in this study reported that they attended seminars or

Table 1: Demographic characteristics and level of knowledge score of schoolteachers in dealing with common emergencies among the study participants

Demographic characters	n (%)	Awareness score Mean±SD	t/F (P)	S/NS
Age				
<40 years	172 (46.4)	20.50±2.56	1.621	NS
>40 years	199 (53.6)	20.06±2.65	0.106	
Gender				
Female	206 (55.5)	20.17±2.42	0.666	S
Male	165 (44.5)	20.39±2.84	0.042*	
Education level				
Bachelor's Degree	290 (78.2)	20.19±2.54	2.087	NS
Master Degree	49 (13.2)	20.65±2.69	0.130	
Diploma Degree	15 (4.0)	21.40±2.85		
Ph.D.	17 (4.6)	19.35±3.12		
School Classification				
Private	67 (18.1)	20.09±2.81	0.209	S
Public	300 (80.9)	20.31±2.59	0.034*	
Others	4 (1.1)	20.00±0.82		
Years of Experience				
<5 years	4 (1.1)	19.83±2.15	0.827	NS
5-10 years	66 (17.8)	20.40±2.72	0.082	
10-20 years	101 (27.2)	20.25±2.59		
>20 years	114 (30.7)	20.44±2.82		
Source information				
Social media	168 (40.8)	20.40±2.26	2.436	NS
Television	115 (27.9)	19.76±2.59	0.064	
Course	26 (6.3)	20.88±3.20		
Educational books	62 (25.0)	20.60±3.14		

P<0.05* Significant at 5% level, NS: Non-significant

courses about first aid. About 50–70% percent of teachers faced a situation that required first aid for the child and two and more than two emergency situations faced by the study participants. Majority of the school teachers 55.3% answered that squeeze the upper abdominal part and let the foreign body comes out as the first aid for choking, 58.2% of the school teachers answered that Ambulance phone number for any emergency situation is 997. In conclusion 51.5% of the teachers participated in the present study had good first aid knowledge.

57.7% of the school teachers reported that they are not confident in giving a proper management for first aid if they faced an emergency situation while 42.3% offer a proper management. This difference might be due to the variation of the number of trained staff on first aid. About 45.3% of the study participants stated that they don't know about the management of eye's when a chemical burn occurs. Only least percentage 28.6% of overall teachers aware about the proper management of eyes when a chemical burn occurs as wear gloves and wash the eye by water. Majority of the elementary school teachers answered as the patient needs to lean forward and squeeze the nose when a nasal bleeding happens for any emergency situation. Considering the teachers answers to the questions related to the proper management of first aid, special attention shall be given for improving the practice of elementary school teacher

on first aid since unintentional injuries are common in a school setting Table 3.

Table 4 In this study, those study participants who did not take any training session on CPR from their school on first aid were found to be less knowledgeable compared with those who had training on first aid. Individuals who have previous knowledge

about first aid were mostly trained on first aid principles. The finding suggests that training is an important strategy to increase the knowledge of school teachers on first aid. Training is a factor that improves the level of knowledge, there was a statistically significant association between first aid training and the level of knowledge with *P* value <0.05. These findings show that the awareness and management of common emergencies among the school teachers can be increased by attending any type of training sessions, courses, or seminar.

These findings demonstrate that school teachers' years of work experience had no statistically significant impact on their awareness of how to handle common emergencies. The year of work was found to be insignificant for the level of first aid knowledge. This implies that people cannot learn and perceive how to deal with common emergency situations through years of experience. This suggests that training and first aid practice are the only ways in which people can become more knowledgeable about common emergencies and gain confidence in managing and handling emergency medical care, rather than years of experience as shown in Table 5.

61.99% of the school teachers possess the knowledge on how to handle a common emergency situation, while the remaining 38.01% lack this essential understanding. These findings emphasize the significance of training teachers in first aid management and ensuring that their skills are regularly updated for practical application. It is imperative to establish a mandatory training session for teachers each academic year. Furthermore, it is crucial to have readily available first aid kits equipped with all necessary items within the school premises. The government should issue a policy statement regarding the provision of first aid in both government and private sector schools. Additionally, organizing specialized workshops to educate all school teachers on basic first aid skills is highly recommended [Figure 1].

Majority 43% reported that there is no enough time for conducting training in the CPR for the school teachers due to their congested teaching schedules, 36% stated that there

Table 2: Knowledge of schoolteachers in dealing with common emergencies

Questions regarding the knowledge of study participants about First Aid	n	%
Have you ever heard about first aid?		
Yes	359	97
No	12	3
Source of your information		
Social media	168	40.8
Educational school books	103	25.0
Television	115	27.9
Others	26	6.3
Knowledge about first aid		
Yes	191	51.5
No	157	42.3
Maybe	23	6.2
Do you think first aid is important		
Strongly agree	283	76.3
Agree	53	14.3
Indifferent	31	8.4
Disagree	4	1
Strongly disagree	0	0
Do you need to learn first aid principles		
Yes	290	78
Maybe	66	18
No	15	4
Attending seminars or courses about first aid		
Yes	205	55
No	166	45
Have you ever faced any situation that required first aid		
Yes	213	57
Maybe	88	24
No	70	19
How many emergency situations did you face		
One	81	21.8
Two	140	37.7
More than two	150	40.5
Do you know the first aid for choking		
Yes	150	40.4
Maybe	144	38.8
No	77	20.8
What is the first aid for choking		
Wait and let the child calm down	38	10.2
Perform CPR	76	20.5
Squeeze the upper abdominal part and let the foreign body comes out	205	55.3
Other	8	2.1
None	44	11.9
Ambulance phone number		
991	62	16.8
997	216	58.2
998	58	15.6
999	35	9.4

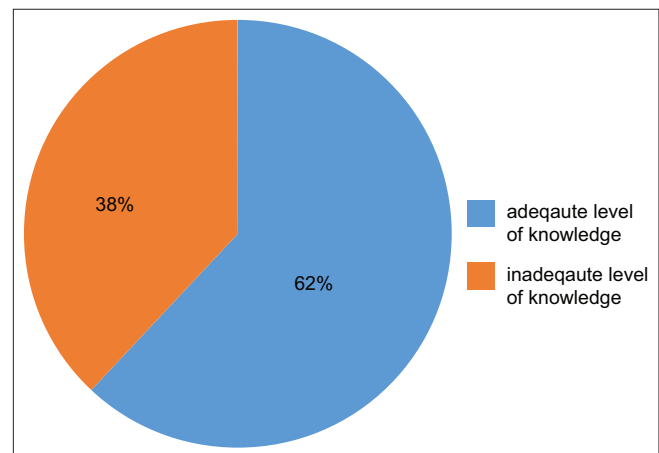


Figure 1: Level of knowledge of schoolteachers in dealing with common emergencies

Table 3: Response of study participants about the proper management of first aid

Questions regarding the knowledge of study participants about the proper management First Aid	n	%
If you faced any emergency case, can you offer a proper management		
Yes	157	42.3
Maybe	175	47.2
No	39	10.5
Do you know the Management of eye's chemical burn		
Yes	98	26.4
Maybe	105	28.3
No	168	45.3
Management of eyes chemical burn		
Wash the eye by water	88	23.7
Wear gloves and wash the eye by water	106	28.6
Call the emergency number	172	46.4
Other	5	1.3
In nasal bleeding you have to		
Elevate the head backwards	59	15.9
Squeeze the nose	70	18.9
Wash the nose with water	31	8.3
Lean forward and squeeze the nose	211	56.9

is no interest for these type of training as it's not included in the curriculum, while 17% reported that these training are not providing free as they need to pay [Figure 2].

There is a significant difference in the awareness of common emergencies and first aid procedures between female and male school teachers. Out of all school teachers, only 33.34% of female teachers and 28.57% of male teachers are prepared to handle an emergency. Students should receive first aid as soon as they are injured in order to keep them safe and healthy. This can prevent disabilities and save lives. The Ministry of Education and School administrators should organize seminar and workshops related to first aid management of minor injuries all primary school teachers in the eastern region [Figure 3].

Discussion

The study found critical first aid knowledge gaps among the 371 surveyed elementary school teachers in Saudi Arabia's Al-Ahsa region. Just 157 (42.3%) teachers felt able to appropriately manage medical emergencies, while 168 (45.3%) could not

Table 4: Relationship of training sessions and the knowledge level of study participants effect of training courses on the level of knowledge of schoolteachers in dealing with common emergencies

Questions related to the training sessions	Knowledge Level		Chi-square value	P	Significant/ not Significant
	Inadequate knowledge n (%)	Adequate knowledge n (%)			
Did your school provide CPR training?					
Yes	23 (16.3)	71 (30.9)	9.823	0.007*	S
No	79 (42.2)	108 (57.8)			
I don't know	39 (27.7)	51 (22.2)			
Do you think that CPR training should be mandatory?					
Agree	46 (32.6)	38 (16.5)	28.696	0.0000*	S
Disagree	8 (5.7)	3 (1.3)			
Neutral	16 (11.3)	15 (6.5)			
Strongly Agree	70 (49.6)	174 (75.7)			
Strongly Disagree	1 (0.7)	0 (0.0)			
Do you have background information about cardiopulmonary resuscitation (CPR)?					
Yes	27 (19.1)	(37.8)	14.876	0.001*	S
No	57 (40.4)	78 (33.9)			
Maybe	57 (40.4)	65 (28.3)			
Have you attended any courses or seminars about first aid?					
Yes	52 (36.9)	153 (66.5)	31.066	0.000*	S
No	89 (63.1)	77 (33.5)			

P<0.05 * Significant at 5% level, NS: Non-significant

Table 5: Relationship between years of work and the awareness of school teachers regarding dealing with common emergencies

Years of work	Knowledge Level		Chi-square value	P	Significant/ not Significant
	Inadequate knowledge n (%)	Adequate knowledge n (%)			
Years of Experience					
5-10 years	38 (27.0)	63 (27.4)	1.491	0.684	NS
10-20 years	45 (31.9)	69 (30.0)			
>20 years	30 (21.3)	60 (26.1)			

P<0.05* Significant at 5% level, NS: Non-significant

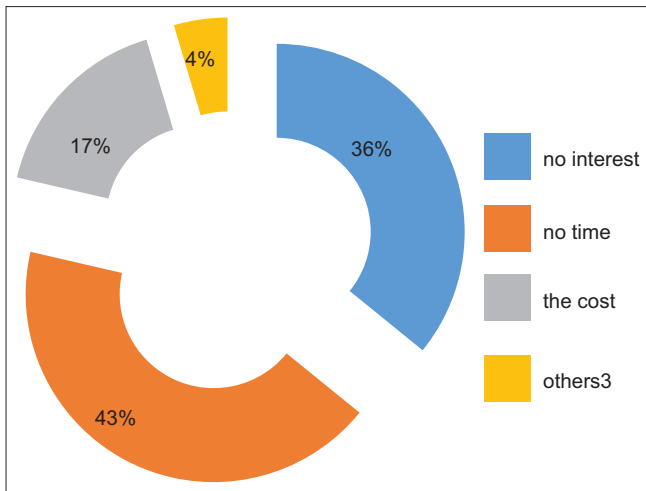


Figure 2: Reasons for not providing CPR training for teachers in the schools

identify correct responses for critical interventions like airway obstruction or chemical burns. Specifically, only 70 (18.9%) correctly selected nose pinching to manage nosebleeds and just 88 (23.7%) chose appropriately irrigating eyes following chemical injuries. Knowledge regarding cardiopulmonary resuscitation was also lacking, with 57 (40.4%) unaware of the basics. The majority 205 (55.3%) did recognize abdominal thrusts for choking management.

Analyzing reasons for poor knowledge highlighted the need for formal training programs. Teachers who had prior first aid certification (153, 66.5%) significantly outperformed counterparts without such training (89, 63.1%) in identifying appropriate emergency responses across situations. However, just 71 (30.9%) recipients reported their schools provided cardiopulmonary resuscitation courses. Enabling consistent competence development through system-wide policies and retraining can optimize skill levels protecting child safety. Years of experience alone cannot cultivate emergency preparedness confidence, as no statistical correlations existed between teacher tenure and knowledge scores.

Similar to Alahmed *et al.* 2023,^[20] we found poor retention of CPR knowledge and skills among teachers, with only 30.9% reporting their schools provided training courses. Additionally, knowledge gaps existed around first aid response across various pediatric emergencies as noted in Li *et al.*^[21] and Al-Kubaisy *et al.* 2019,^[22] including inappropriate choking, seizure, and chemical burn management steps.

However, our study found slightly higher overall first aid knowledge scores (mean 20.3) compared to Al Enizi *et al.*^[23] 2016 (mean 4.0) using a different questionnaire metric. We also noted a higher desire for first aid training among our respondents (78%) versus 64.9%.

Similar to Albadrani *et al.* 2023,^[24] we found prior first aid training strongly correlated with superior knowledge and appropriate

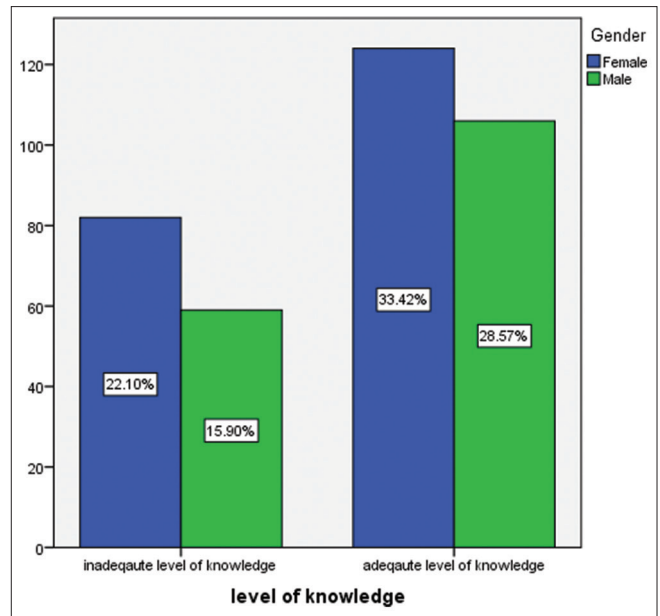


Figure 3: Comparison of gender-wise knowledge level of schoolteachers in dealing with common emergencies

response selection, compelling policy-level changes. But unlike their observations, participant age and teaching experience in our cohort did not predict superior first aid understanding, supporting consistent retraining needs regardless of seniority.

Strategies enhancing first aid delivery within schools require multifaceted approaches addressing barriers like crowded schedules, budget constraints, and variability in baseline skill levels through sustainable policies applied nationally.^[24] Mandating regular paid leave and allowing teachers' participation in re-credentialing workshops ensures time protection and optimizing engagement.^[25] Embedding compulsory competency milestones into teacher licensing frameworks and employment terms guarantees universal emergency management fluency centered on student wellness.^[7] Government public health departments within education ministries must also formulate consistent first aid educational content and stepwise assessment rubrics for delivery in all schools, supporting equitable, standards development.^[26] Dedicating funds ensuring free localized program access further enables participation absent financial limitations alongside placing universal first aid requirements in school accreditation processes to motivate institutional prioritization.^[2]

In reflecting upon the findings of this study, it is important to consider the influence of sociocultural factors on the baseline knowledge and attitudes toward first aid training among school teachers in Saudi Arabia. Sociocultural dynamics, including religious beliefs, gender roles, and community-oriented values, may significantly shape the approach and responsiveness to first aid education in ways that differ from Western contexts, where research in this field is very limited.^[27] These factors could impact not only the willingness of teachers to participate in first aid training but also the effectiveness of such training when cultural

sensitivities and practices are not adequately addressed. Therefore, the development and implementation of first aid training programs in Saudi Arabia must take into account these sociocultural nuances to ensure their relevance, acceptance, and success. Recognizing and integrating these cultural considerations could greatly enhance the preparedness of school teachers to manage medical emergencies, aligning training strategies with the societal values and practices that underpin the Saudi educational context.

Key strengths of this study include the use of a standardized questionnaire adapted from validated instruments, a geographically diverse teacher sample representing over 2000 schools, adequate power with a large sample size, and robust statistical analyses examining correlations. The achievement of a 100% response rate in our survey is a testament to the robustness of our engagement strategy, which included pre-survey engagement, ensuring convenience and accessibility, offering incentives, providing clear support, regular follow-up, and leveraging collaboration with educational authorities, thereby significantly enhancing the reliability and representativeness of our findings. However, self-reported data relies on truthful responses, while excluding school administrators limits perspectives. The cross-sectional nature only evaluates a snapshot versus longitudinal trends. Convenience sampling of more accessible sites may induce biases relative to remote schools. Knowledge was tested instead of directly observed skills. Still, illuminating critical capability gaps across diverse injury types highlights where interventions must target teachers responsible for child safety.

Conclusion and Recommendations

This study revealed critical knowledge gaps in practical first aid skills among elementary school teachers for effectively managing child medical emergencies. With just 42.3% expressing confidence handling situations and specific weaknesses noted across areas like airway obstruction, bleeding control, and chemical injuries, findings underscore ethical imperatives modernizing safety infrastructure. Teachers act as frontline caregivers responsible for vulnerable students. Enabling their emergency preparedness through mandatory, regularly updated training tied to employment ensures harm minimization when seconds count most. Strategies must address identified barriers around crowded schedules, variable skill levels, and budget limitations through sustainable nationwide policies applied across public and private sectors equally. Multifaceted approaches centered on verified competencies offer solutions elevating staff capabilities amidst bounds of feasibility. By spotlighting capability deficiencies governing inalienable safety duties, reform must be enacted fulfilling schools' basic obligations protecting children. Urgent infrastructure investments that cultivate teacher emergency preparedness remain essential to safeguard our most vulnerable populace from needless harms, paying dividends for generations.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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