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Original Research Article

Evaluating first aid knowledge among primary teachers and service evaluation in government schools, Visakhapatnam, India

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ABSTRACT

Background: Ensuring school children's safety is crucial due to their susceptibility to illnesses/injuries and limited ability self-protect. Teachers serve as vital role in the absence of immediate medical assistance, highlighting the importance of basic first-aid training and preparedness for various health emergencies to safeguard students' well-being. Therefore, this study assessed the level of first-aid knowledge among government primary school teachers in Vishakhapatnam, India.

Methods: A cross-sectional study was conducted to assess first-aid knowledge among primary teachers in government schools in urban Visakhapatnam. Cluster sampling was employed to select schools, followed by simple random sampling within each selected school to choose teachers. Quantitative phase considered a semi-structured, validated online questionnaire developed by Tech Mahindra Foundation and service evaluation involved discussion with principals.

Results: Among 133 participants, 65 (48.87%) held postgraduate degrees and majority 91 (68.42%) were female. 93.23% (n=124) were familiar with first-aid procedures but only 78 (58.65%) completely unaware when to replace a first-aid kit. A higher proportion of males demonstrating good knowledge compared to females (P value = 0.031). Study suggested adding items to first-aid kits and implementing safety signage boards. Participants recommended formal first-aid training by government, NGOs, or healthcare professionals to enhance skills and knowledge.

Conclusions: The study revealed high first-aid knowledge among primary teachers, but identified gaps in supply replacement and specific emergency responses. These findings are crucial for enhancing safety and improving first-aid knowledge, highlighting the importance of collaboration between teachers and parents through first aid awareness sessions to effectively respond to medical emergencies at school and home.

Keywords: Awareness, First-aid, Schools, Knowledge, Perception

INTRODUCTION

Injuries and sudden illnesses are significant public health concerns, occurring unpredictably during daily life. School children's injuries, in particular, represent a major aspect of this issue. First aid is the immediate care provided to victims of sudden illness or injury until professional medical assistance is available. This is especially crucial for school children, given their extended time on school premises. Early intervention in such emergencies can significantly reduce morbidity and mortality among school-aged children.[1] Globally, injury and violence are leading causes of death among children, accounting for approximately 950,000 deaths annually in individuals under 18 years old. Unintentional injuries alone are responsible for 3.16 million of the 4.4 million injury-related deaths each year, comprising 90% of total injury deaths.[2] For children aged 5 to 14, drowning ranks

as the sixth leading cause of death. Additionally, falls result in over 684,000 fatalities annually and represent an escalating yet often overlooked public health issue.[3]

Children spend a significant portion of their time at school, necessitating the creation of a safe and secure environment. Due to their physical size, limited understanding of risks and impulsivity, children are particularly vulnerable to accidents. Consequently, timely first aid administration following an accident is vital and can be life-saving.[4,5] In schools, teachers frequently assume the responsibility of managing emergencies. As the primary adults present, teachers must make critical decisions and take appropriate actions. This underscores the importance of first-aid training and knowledge among educators, enabling them to determine when a child needs medical attention and to implement measures to ensure a swift recovery with minimal disruption.[6] A noteworthy resource in this endeavor is the FAST - First Aid Mobile App, developed by National Disaster Management Authority (NDMA) in collaboration with the Indian Red Cross Society, which facilitates first aid training for both teachers and students.[7]

During school hours, children may experience various health emergencies, including status asthmaticus, diabetic crises, status epilepticus, cardiac emergencies, tooth avulsion, and dental fractures.[8,9] Schools must be prepared to recognize these medical and dental emergencies and have protocols in place to manage such incidents. Additionally, schools should regularly conduct mock earthquake and fire safety drills and provide ongoing first aid training for all teachers and staff.[10] In India, the National Disaster Management Authority (NDMA) has implemented guidelines that mandate the availability of first aid kits and trained personnel in schools, emphasizing the critical role of preparedness.[11]

To support these efforts, the World Health Organization (WHO) has developed guidelines and training programs aimed at improving first aid knowledge and practices globally. The WHO's "Global School Health Initiative" promotes comprehensive health education, including first aid, to enhance the well-being of students.[12] Similarly, the International Federation of Red Cross and Red Crescent Societies (IFRC) provides extensive first aid training programs that are adaptable to various cultural contexts and age groups, emphasizing practical skills and community involvement.[13] The primary objective of this study is to evaluate the first aid knowledge and practices among primary school teachers in government schools in Visakhapatnam, India. Additionally, the study aims to assess the quality and availability of first aid services within these schools.

METHODS

Study design

This study was a cross-sectional study.

Study setting and duration

This cross-sectional study was conducted over a period of four months, from June 2023 to September 2023, in Government schools situated in the urban areas of Visakhapatnam, Andhra Pradesh, India.

Study population

The study population included all primary school teachers working in Government schools with a minimum of six months of teaching experience in a specific school and willingness to participate. Exclusion criteria were teachers who were also responsible for teaching secondary and higher secondary classes in addition to primary school. The selection of Government schools in urban Visakhapatnam provided a diverse and representative sample of primary school teachers for the study.

Sample size and sampling technique

The sample size was determined using a single population proportion: n=d×(z_(1-α/2)^2)/E^2 ×p(1-p), where p represents the proportion of individuals unfamiliar with first-aid practices, E is the margin of error, d is the design effect, and z1-α/2 is the standard normal variate at the α level of significance. For this study, a 95% confidence level with a 5% margin of error and a design effect of 1.5 were considered. According to the study by, the total sample size required was calculated to be 130.[6]

A cluster sampling approach was employed to select schools within the urban area of Visakhapatnam. Initially, 39 clusters were identified based on wards, from which 5 clusters were randomly selected. These 5 clusters contained a total of 30 government schools. Within each of these 5 clusters, 3 government schools were further selected using simple random sampling, resulting in a total of 15 schools being chosen for the study. Subsequently, eligible teachers from Hosapatna et al which reported that 94.3% of teachers were unfamiliar with first-aid practices these 15 schools were selected using simple random sampling to achieve the desired sample size for the study. Five schools were chosen based on their willingness to provide information regarding first aid for the qualitative aspect of the study.

Data collection

For the quantitative aspect, data was collected using a semi-structured, validated online questionnaire developed by Tech Mahindra Foundation.[14] This questionnaire encompassed inquiries on knowledge, perception, and awareness regarding first-aid practices. Online surveys were administered via Google Forms to the selected government school teachers. For school evaluation, the interview guide was derived from the "Guidelines on School Safety and Security" by the Department of School Education and Literacy, Ministry of Education,

Government of India.[15] Appointments for interviews were arranged through the headmasters of the primary schools. Verbal consent was obtained, and details regarding the process were explained to the headmasters prior to the interviews. With their permission, the interviews were recorded, and the data was later translated from Telugu to English. To ensure confidentiality, no information was collected regarding the names of the interviewers or their schools, and any such details mentioned during the interviews were anonymized. Data were stored securely in password-protected files accessible only to authorized personnel.

Data analysis

Data was entered in Microsoft Excel and was analysed using STATA version 14.2. Categorical data were summarized using frequencies and percentages. Chi-square tests were used to evaluate significance, with a p-value < 0.05 indicating statistical significance. The 95% confidence interval (CI) was calculated with the proportion. As the data did not follow a normal distribution, the median and interquartile range (IQR) were computed. Qualitative data were prepared by transcribing interviews verbatim, ensuring accuracy and confidentiality. Transcripts were anonymized and, if needed, translated. Thematic coding was then manually performed to analyze the data, identifying key themes and patterns. Ethical approval of the study was given from Institutional Ethics Committee of Indian Institute of Public Health, Hyderabad (IIPHH/TRCIEC/332/2023 Dated 10/5/2023). All the participants provided with written informed consent. Anonymity and confidentiality were maintained throughout the study process.

RESULTS

In this study, initially 138 primary school teachers were eligible, but two declined consent and three were excluded for not meeting predefined criteria, resulting in a final sample of 133 teachers. The majority of teachers were female (68.42%), and most had post-graduate qualifications (48.87%). The median age of the teachers was 43 years, and their median teaching experience was 12 years (Table 1).

Table 1: Socio-demographic of the teachers.

Characteristic	Estimate
Gender, N (%)	
Male	42 (31.58)
Female	91 (68.42)
Education, N (%)	
Diploma	9 (6.77)
Graduate	59 (44.36)
Post-graduate	65 (48.87)
Age (years), median (IQR)	43 (23-60)
Teaching experience (years), median (IQR)	12 (2-36)

Table 2: Level of knowledge of first-aid practices among school teachers.

Variable	n=133	Level of knowledge				P value
		Good, N (%)	Basic, N (%)	Poor, N (%)	No, N (%)	
Gender						
Male	42	16 (38.1)	19 (45.2)	2 (4.8)	5 (11.9)	0.031*
Female	91	20 (22)	65 (71.4)	2 (2.2)	4 (4.4)	
Education						
Diploma	9	3 (33.3)	4 (44.4)	0 (0)	2 (22.2)	0.253
Graduate	59	12 (20.3)	41 (69.5)	3 (5.1)	3 (5.1)	
Post-graduate	65	21 (32.3)	39 (60)	1 (1.5)	4 (6.2)	
Age (years)						
<45	77	19 (24.7)	51 (66.2)	2 (2.6)	5 (6.5)	0.853
>=45	56	17 (30.4)	33 (58.9)	2 (3.6)	4 (7.1)	
Teaching experience (years)						
<=10	40	7 (17.5)	27 (67.5)	2 (5)	4 (10)	0.291
>10	93	29 (31.2)	57 (61.3)	2 (2.2)	5 (5.4)	

*Statistical significant.

Of the 133 primary school teachers surveyed, 93.2% (n=124, 95% CI: 87.5, 96.9) were found to have knowledge of first-aid practices. Among these teachers having knowledge, 36 (29%) are classified as having good knowledge, 84 (67.8%) possess basic knowledge, and 4 (3.2%) exhibit poor knowledge of first-aid practices. Gender showed a significant association with the level of knowledge (P=0.031), with a higher proportion of males having good knowledge compared to females. However, education level, age, and teaching experience did not show significant associations with the level of knowledge (Table 2). Source of information was media (n=74, 55.6%), followed by government circulars and manuals (n=45, 33.8%).

Out of 133 teachers, 48 (36.09%) are completely aware of the contents of a first aid kit, but 78 (58.65%) are completely unaware of when to replace first aid supplies. Awareness of symptoms and appropriate responses to various emergencies is generally low, with significant portions of participants being either unaware or only partially aware, such as 71 (53.38%) completely unaware of how to identify a fracture and 70 (52.63%) completely unaware of the symptoms indicating unconsciousness. Awareness among teachers is generally low, with minority being fully knowledgeable about ambulance functions 26 (19.55%) and the composition 40 (30.08%) and responsibilities 3 (2.25%) of emergency response teams, while significant portions are unsure or unaware (Table 3).

Table 3: Knowledge and awareness of basic first aid and emergency response practices.

Question	Completely aware N (%)	Partially aware N (%)	Aware but unsure N (%)	Unaware N (%)	Completely unaware N (%)
Knowledge of basic first-aid essentials					
First aid kit and its contents	48 (36.09)	53 (39.85)	0	0	32 (24.06)
When to replace first aid supplies	10 (7.52)	45 (33.83)	0	0	78 (58.65)
Knowledge of symptoms for common medical emergencies					
Symptoms in a person who face breathing abnormalities	42 (31.58)	34 (25.57)	8 (6.01)	16 (12.03)	33 (24.81)
Identify if a person has a fracture	5 (3.76)	20 (15.04)	15 (11.28)	22 (16.54)	71 (53.38)
Symptoms to indicate that a person is unconscious	0	5 (3.76)	21 (15.79)	37 (27.82)	70 (52.63)
Symptoms of animal or insect bites	11 (8.27)	38 (28.58)	8 (6.01)	8 (6.01)	68 (51.13)
Knowledge of first-aid responses and practices in common emergencies					
Response to when a person has fainted	9 (6.76)	49 (36.84)	32 (24.06)	28 (21.05)	15 (11.28)
Response to a conscious person but airway obstructed by a foreign object	37 (27.81)	0	0	0	96 (72.19)
Response in case of insect/animal bite	5 (3.76)	33 (24.81)	16 (12.03)	49 (36.84)	30 (22.56)
Ideal response in case of fracture	38 (28.58)	0	34 (25.56)	0	61 (45.86)
Response in case of a deeply embedded object	43 (32.33)	0	56 (42.11)	0	34 (25.56)
Response in case of a person being stuck by electricity	7 (5.27)	60 (45.11)	20 (15.03)	38 (28.57)	8 (6.02)
Awareness about first aid practices and emergency response					
Awareness regarding the functions of an ambulance	26 (19.55)	38 (28.58)	49 (36.84)	11 (8.27)	9 (6.76)
Awareness of the composition	40 (30.08)	0	66 (49.62)	0	27 (20.30)
Awareness of the responsibilities	3 (2.25)	11 (8.27)	39 (29.33)	19 (14.29)	61 (45.86)

Table 4: Statements of agreement regarding first aid practices.

Question	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly disagree N (%)
School's guardianship or school custody	39 (29.4)	66 (49.6)	14 (10.5)	10 (7.5)	4 (3.0)
Schools' Preparedness	82 (61.7)	51 (38.3)	0	0	0
Teacher's training on first aid	65 (48.9)	63 (47.4)	5 (3.8)	0	0
Teachers' First Aid Training Frequency	42 (31.6)	74 (55.6)	17 (12.8)	0	0

Out of 133 teachers, 88 (66.2%) perceive the use of first aid for burns, fractures, followed by 56.4% for bites and stings. Teachers showed strong support for various aspects of first aid in schools, with 105 (79%) agreeing on the importance of first aid in school guardianship, all teachers agreeing on schools' preparedness, 128 (96.3%) agreeing on teacher training, and 116 (87.2%) agreeing on the teachers' first aid training frequently. These findings suggest a clear consensus on the significance of first aid practices in schools (Table 4).

Based on school evaluation, first aid practices in schools reveals several key themes. First, the significance of well-stocked first aid kits, including essentials like cotton, iodine, and band-aids, was emphasized, with suggestions

for additional items such as gauze rolls and painkillers, funded primarily through school grants. Participants highlighted varying levels of first aid knowledge, advocating for formal training by government or NGOs, and certification to bolster teacher credibility. The absence of signage boards in schools was noted, with recommendations to improve safety through visual aids. Overall, study expressed satisfaction with current first aid kits and the knowledge of staff, recognizing the support of nearby healthcare facilities. However, they suggested enhancements including formal teacher training, regular health check-ups, awareness campaigns, and collaboration with health personnel. The role of principals was seen as crucial in supervising first aid preparedness and supporting improvements, underscoring the need for comprehensive first aid services to ensure student safety and well-being.

DISCUSSION

The study assessed first aid knowledge among primary school teachers in government schools in Visakhapatnam, India. The study revealed that while a substantial majority (93.23%) had some knowledge of first aid but only 29% were classified as having good knowledge. Gender was significantly associated with the level of knowledge.

Our study findings are consistent with previous research assessing first aid knowledge among school teachers. Aderibigbe et al found that while primary school teachers in Ilorin, Nigeria, were generally aware of first aid, their practical knowledge was limited. Similarly, Joseph et reported significant gaps in first aid knowledge among teachers in Mangalore, South India. But contrast findings from Hosapatna et al where only 5.7% of teachers were familiar with first aid concepts.[6] This consistency in knowledge levels across various demographic variables (education, age, or experience) underscores the effectiveness of general training programs that reach a broad audience.[16]

Despite the overall high level of first aid knowledge, the study uncovered notable gaps in specific areas. For instance, only 36.09% of teachers were completely aware of the contents of a first aid kit, and a mere 7.52% knew when to replace first aid supplies. Furthermore, awareness of symptoms and appropriate responses to various emergencies was generally low. These findings are consistent with studies emphasizing the need for ongoing, detailed training to ensure comprehensive first aid knowledge and preparedness among school staff.[17,18]

In India, several government programs and initiatives aim to improve first aid knowledge and practices in schools. The Ministry of Human Resource Development's National School Safety Program (NSSP) emphasizes the importance of first aid training for teachers and students. Additionally, the Rashtriya Bal Swasthya Karyakram (RBSK) program focuses on providing comprehensive healthcare, including first aid services, to children in schools.[10,15,19] However, despite these initiatives, our study suggests that there are still significant gaps in first aid knowledge among primary school teachers. This indicates a need for more robust and targeted interventions to ensure that teachers are adequately trained and prepared to handle medical emergencies in schools.

There is a clear need for more comprehensive and practical first aid training programs for school teachers. These programs should not only focus on basic first aid knowledge but also cover specific emergency scenarios that teachers are likely to encounter. This could be achieved through periodic workshops and refresher courses. Schools also should ensure that they have well-stocked and regularly updated first aid kits. Clear protocols should be established for maintaining these kits and replacing supplies as needed.[20-23]

CONCLUSION

The study reveals that most primary school teachers possess a significant level of first aid knowledge, consistent across various demographic factors. It emphasizes the importance of well-equipped first-aid kits, formal teacher training, and clear communication via signage boards. It advocates for proactive measures, including regular health check-ups, public awareness campaigns, and collaboration with medical personnel. It underscores the need for ongoing education and awareness among teachers to ensure student safety. A comprehensive approach is suggested to enhance student safety and well-being, involving frequent mock exercises and training for medical emergencies. This suggestion creates a safer and healthier educational environment for children.

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