

Research Article

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Knowledge of first aid measures and associated factors among governmental primary school teachers in Hawassa city, Southern Ethiopia

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Keywords: First aid; School children; Teachers; Knowledge; Associated factors; Ethiopia.

Abbreviations: CPR: Cardiopulmonary resuscitation; BSc: Bachelor of Science; MSc: Masters of Science; CDC: Center for Disease Control and Prevention; WHO: World Health Organization; LMIC: Low- to Middle-Income Countries; IRB: Institutional review board of Hawassa University; SNNPR: Southern Nations Nationalities and Peoples Region; COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio; CI: Confidence Interval; SPSS: Statistical Package for Social Sciences.

Abstract

Background: Most of the time primary school children experience minor injuries and they always need first aid care to prevent conditions become worse and school teachers are the nearest ones to manage their minor injuries. Lack of knowledge and skills of their teachers may lead to serious health consequences. Acquiring the basic knowledge and skills of first aid can be vital for teachers to be able to provide proper emergency pre-hospital care in the event of an accident to save life and prevent avoidable consequences. The aim of this study was to assess knowledge on first aid measure and its associated factors among governmental primary school teachers in Hawassa city, southern Ethiopia.

Methods: A cross-sectional study design was conducted from February 4-22, 2021. Data were obtained from 213 primary school teachers selected by simple random sampling technique from eight schools using a self-administered questionnaire. Epi Info 3.5.4 was a data entry software and SPSS version 20.0 was selected for analysis. Associations among variables were assessed by binary logistic regression.

Result: A small proportion of 52 (23.2%) of teachers were knowledgeable (95% CI 17.9-28.6) about first aid measures. Only 57 (21.4%) teachers had received first aid training previously. One-fourth of 56 (25%) of the respondents gave accurate responses for the need for priority for obstructed airway and only nine (4%) teachers knew the 7 essential steps of Cardiopulmonary Resuscitation (CPR). Level of education AOR = 2.866 (95% CI 1.386, 5.925) and previous first aid training AOR = 7.216 (95% CI 3.437, 15.153) were statistically significant protective associated factors with teachers' knowledge on first aid measures.

Conclusion: A great proportion of 172 (76.8%) of primary school teachers were unknowledgeable about first aid measures which were higher compared to reports from several studies. This needs exceptional attention to train teachers periodically on first aid procedures to equip them to perform effective first aid measures to treat the common emergencies of children at school.

Background

First aid is the immediate support provided to a sick or injured person until professional help reaches. It is worried not only with physical injury or illness but also with other primary care, including psychosocial support for public suffering from expressive distress caused by experiencing or witnessing a traumatic event. First aid interventions seek to preserve life, improve suffering, prevent further illness or injury and help-salvage [1]. School children are vulnerable to several risks due to their still maturing physical and mental abilities and their increased activities [2]. They are more exposed to the risks of accidents and injuries and hence require first-aid more often than do adults [3]. A study revealed that in a cohort of school children, the majority of injuries (88%) were directly related to physical activity. Moreover, almost 20% of all physical activity-related injuries occurred during school hours [4]. Another study identified that approximately two-thirds of all deaths among children and teenagers result from injury-related causes [5].

Studies have been emphasized that administering appropriate first aid to students soon after the injuries or unexpected illnesses can be lifesaving [6]. The importance of first-aid measures is particularly evident when the victim is a child. The mental and physical abilities of children are not developed enough to allow them to protect and defend themselves [7]. Common types of school accidents were coma, epistaxis, shortness of breathing, fractures, joint dislocation, hematoma, burns, choking, seizures, insect bites, and poisoning [8]. This reflects the major importance of the first-aid provided to the victim, which may sometimes be life-saving [4]. Globally, trauma resulting from accidents is the fourth most common cause of death. Accidents are the most common cause of death among children between the ages of 7 and 14 years (20-60%) [9]. In Ethiopia, a large proportion of injury deaths occur among students. It is estimated that of the 83,516 total injury deaths in 2015, from this 11,684 among school-age children 5-14 years [10]. Teachers are the main caregivers and the first line of protection for school children. Their role complements that of parents. During school hours, school teachers are the first-respondent in cases of disasters or emergencies. They must be able to deal properly with health emergencies both in normal children, and those children with special health care needs [3]. This role can be achieved if teachers are equipped with the required skills to provide effective first aid services that promote recovery and prevent future serious health consequences so appropriate in-service training for teachers in child protection is of main importance [3].

World wide, most the studies about the knowledge and skills of school teachers are insufficient and school health services are often neglected, and this may reflect the lack of awareness and training about common illnesses and first-aid care [7]. Consequently, the assessment of school teachers' knowledge regarding first-aid measures is crucial to provide the health personnel with proper information about the educational needs, which can help them to plan and organize health education training programs to enhance teachers' awareness [11]. In Ethiopia, studies about the level of knowledge and attitude of school teachers about providing first aid are lacking. Therefore, this study aims to explore primary school teachers' knowledge and associated factors regarding first aid in Hawassa City, Southern Ethiopia.

Methods

Study design and settings

An institution-based cross-sectional study was done from February 4–22, 2021. The study was conducted at Hawassa city Governmental Primary schools. Hawassa is the capital city of SNNP and Sidamaregions of Ethiopia which is 273 km far from the south of Addis Ababa. Hawassa can be considered as one of the best-developed cities in Ethiopia. Currently, it consists of 8 sub-cities and 32 kebeles. In Hawassa city administration there are 42 governmental primary schools. There are 834 male and 1,002 female teachers from this 359 BSc, 1,464 diploma, 13 certificate holders. There are 28,557 males and 37,252 females total of 65,809 primary school students.

Sample size and sampling procedure

The sample size was determined by using a single population proportion formula with a 95% confidence interval, a 5% margin of error, and adding a 5% contingency for illegible handwriting and incomplete medical records.

By using the proportion of 50% since no published data was identified, the sample size was calculated as follows.

$$n = \frac{(z)^2 P(1-P)}{d^2} \quad n = \frac{(1.96)^2 0.5(1-0.5)}{(0.05)^2} = 384$$

Then since the study population is < 10,000, correction formula was used as follows:

$$1+ni \quad n+N$$

Sample size= $ni=Ni \times N=384*456/384+456$ (N= total number of teachers in randomly selected 8 primary schools [456]) = 213

Therefore, by adding 10 % for possible non-response rate, the final sample size was =234.

A simple random sampling technique was used to select the primary schools. Two schools from every 4 sub-cities were selected.

Data collection tools and procedures

A structured data collection tool was adopted [12] and used to capture data from study participants. Pretest was conducted 5% of the sample size at Argo Hammesso Primary School that is not included in the actual sample size. The findings of the pretest were used to ensure a better understanding of the data collection process before actual data collection. Data was collected by Self-administered technique.

The data collectors were trained for half-day on data collection methodology and related issues before the start of data collection and were closely supervised by the school directors during the data collection. Filled questionnaires were checked daily for completeness, clarity, and accuracy. Data cleaning was undertaken before entry and analysis.

Statistical analysis

Data entry was done by using EPI Info 3.5.1 and exported to SPSS version 20.0 software package for analysis. The descriptive analysis including frequency and cross tabs were used to assess

the frequency of dependent with independent variables. Binary logistic regression was carried out to assess the association of dependent with independent variables and to determine predictors of knowledge using odds ratios with 95% confidence interval (CIs). Finally, a forward stepwise logistic regression model with all independent variables having p-value <0.25 were fitted and Adjusted Odds Ratio (AORs) were calculated to identify independent predictors of knowledge of first aid measures. A value of p< 0.05 was considered statistically significant.

Ethical consideration

A written ethical clearance was obtained from the IRB (Institutional Review Board) of Hawassa University, Hawassa, Ethiopia. A formal letter of cooperation was written to the selected school's directors and permission was obtained before the beginning of data collection. After the provision of sufficient information about the purpose of the study, verbal and written consent was obtained from all study participants.

Operational definitions

Knowledgeable: If participants score $\geq 50\%$ for knowledge questions.

Unknowledgeable: If participants score below 50% for knowledge questions.

Result

Socio-demographic characteristics of the study participants

A total of 224 teachers were participated with a response rate of (95.7%). Female teachers accounted for 132 (58.9%) and more than half of them 126 (56.25%) were found in the age group of 20-30 years with mean age 31.4. Concerning the educational status of the participants, the majority 139 (62.1%) were diploma and 83 (37.1%) had 6-10 years of work experience. Only 57 (21.4%) of teachers obtained previous first aid training (Table 1).

Table 1: Socio-demographic characteristics of primary school teachers at Hawassa City, southern Ethiopia, from February 4-22, 2021 (n=224).

Socio-demographic characteristics	Frequency	Percent
Sex		
Male	92	41.1
Female	132	58.9
Age in years		
20 – 30	126	56.25
31-40	79	35.27
41-50	14	6.25
>50	5	2.23
Level of education		
Diploma	139	62.1
Bachelor and above	85	37.9
Work experience in years		
1- 5	67	29.9
6-10	83	37.1
11-15	51	22.8
>15	23	10.3
Previous first aid training		
Yes	57	25.4
No	167	74.6

Table 2: Knowledge of primary school teachers on specific first-aid measures at Hawassa City, southern Ethiopia, from February 4-22, 2021 (n=224).

Questions on specific first aid measures		Correct answer
First aid is the immediate care given for a person who sustained an injury or accident before the victim arrives at health institutions	Yes	157 (70.1%)
Types of accidents/injuries need first aid?	Bleeding	168 (75%)
	Air way obstruction	79 (35.3%)
	Burn	83 (37.1%)
	Epilepsy	43 (19.2%)
	Fracture	21 (9.4%)
The priority is given to obstruction of the airway	Yes	56 (25%)
Causes of airway obstruction	Foreign body	120 (53.6%)
	Tongue back fold	88 (39.3%)
	Secretion	53 (23.7%)
	Drowning	18 (8%)
Signs of airway obstruction	Unable to talk	95 (42.4%)
	Unable to breath	132 (58.9%)
	Shallow breathing	33 (14.7%)
	Sweating	14 (6.3%)
Method of opening an airway	Head tilt and chin lift	61 (27.2%)
	Jaw thrust man over	23 (10.3%)
Methods of giving artificial breathing	Mouth to mouth	161(71.9%)
	Mouth to nose	67 (29.9%)
The purpose of chest compression (CPR) is to facilitate blood circulation	Yes	74 (33%)
Method of Chest Compression (CPR)	The 7 essential steps	9 (4%)
Giving nothing by mouth is one of the first aid measures for an unconscious patient	Yes	122 (54.5%)
Methods to stop bleeding	Applying direct pressure	93 (41.5%)
	Elevation of the bleeding site	83 (37.1%)
First-aid measures are taken to an epileptic patient	Make safe environment	116 (51.8%)
	Place soft thing under head	69 (30.8%)
	Don't resist the patient	18 (8%)

Knowledge of teachers on specific first aid measures

The majority of primary school teachers 157 (70.1%) answer correctly about what is first aid mean and even if all causes of accidents need first aid measures, the more selected accident by the teachers which needs first aid was bleeding 168 (75%) and the least selected was fracture 21 (9.4%). The need for priority to obstruct airway was answered correctly only by 56 (25%) of respondents. A foreign body was the most correctly answered cause of airway obstruction by respondents 120 (53.6%) and unable to breath was selected by 132 (58.9%) of them as a sign of airway obstruction. From methods of opening the airway, only 61 (27.2%) of participants selected head

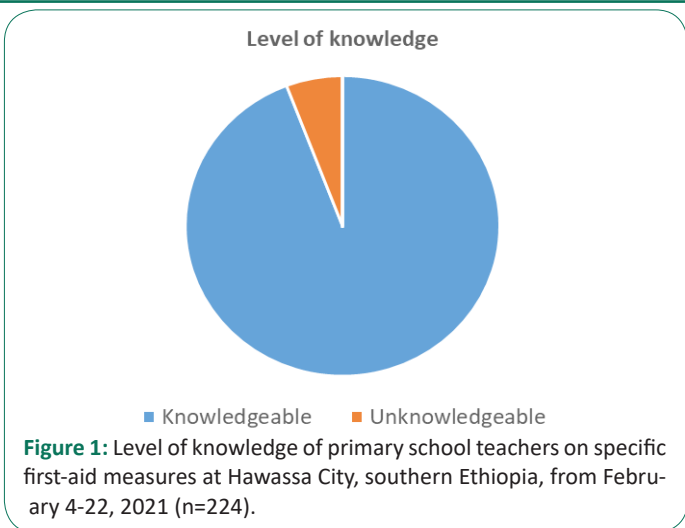
tilt and chin lift technique, Mouth to Mouth method to give artificial breathing was responded correctly by 161 (71.9%) of study participants and the accurate purpose of Chest Compression (CPR) answered accurately only by 74 (33%) of them. The 7 essential steps of CPR identified only by 9 (4%) of teachers and giving nothing by mouth for unconscious victims answered correctly by 122 (54.5%) of the respondents. From methods to stop bleeding, applying direct pressure was answered correctly by 93 (41.5%) teachers while making safe environment was the most correctly answered item 116 (51.8%) for an epileptic patient. Table 2.

Level of knowledge on first aid measures

Concerning level of knowledge, only 52 (23.2%) were knowledgeable (95% CI 17.9–28.6) about first aid measures (Figure 1).

Factors associated with first aid measures

This study identified that male teachers; teachers in the age group 41-50 years; and teachers with work experience >15 years were identified as more knowledgeable on first aid measures than their colleagues even if the associations were not



statistically significant. The result of this study also identified that bachelor holders were nearly 3 times AOR = 2.866 (95% CI 1.386, 5.925) and teachers with previous first aid training nearly were 8 times AOR = 7.841 (95% CI 3.686, 16.682) more knowledgeable on first aid measures than their counterparts (Table 3).

Table 3: Factors associated with knowledge of primary school teachers at Hawassa City, southern Ethiopia, from February 4 – 22, 2021 (n=224).

Variables	Knowledge category		COR (95% CI)	AOR (95% CI)	
	Knowledgeable	Un knowledgeable			
Sex	Male	25 (27.2%)	67 (72.8%)	0.689 (0.369, 1.287)	0.654 (0.310, 1.379)
	Female	27 (20.5%)	105 (79.5%)	1	1
Age in years	20 – 30	25 (19.8%)	101 (80.2%)	1	1
	31- 40	21 (26.6%)	58 (73.4%)	1.010 (0.108, 9.436)	0.723 (0.054, 9.689)
	41-50	5 (35.7%)	9 (64.3%)	0.690 (1.073, 6.534)	0.605 (0.046, 7.894)
	50	1 (20.0%)	4 (80.0%)	0.450 (1.039, 5.209)	0.794 (0.050,12.613)
Level of education	Diploma	19 (13.7%)	120 (86.3%)	1	1
	Bachelor and above	33 (38.1%)	52 (61.9%)	4.008 (2.089, 7.689)*	2.866 (1.386, 5.925) **
Work experience in years	1- 5	16 (23.9%)	51 (76.1%)	1	1
	6-10	18 (21.7%)	65 (78.3%)	2.049 (0.748, 5.616)	1.244 (0.271,5.702)
	11-15	9 (17.6%)	42 (82.4%)	2.321 (0.865, 6.227)	1.599(0.393,6.502)
	>15	9 (39.1%)	14 (60.9%)	3.000 (0.994, 9.051)	1.965(0.475,8.119)
Previous first aid training	Yes	32 (56.1%)	25 (43.9%)	9.408 (4.666, 18.971)*	7.216 (3.437, 15.153) **
	No	20 (12.0%)	147 (88.0%)	1	1

Discussion

Injury is a common cause of morbidity and mortality in children, and rapid administration of first aid may help to decrease this morbidity and mortality. Since physicians and nurses often are not available at primary schools in Ethiopia, teachers should have adequate knowledge and skills of first-aid measures. Only 57 (21.4%) of teachers obtained previous first aid training in this study in contrast with the result of different studies ranging from 60 – 70 % [13,9,14-16,6] the difference it might be due to the setting as first aid training is not included in the curriculum of primary school teachers in Ethiopia. Bleeding can be life-threatening and losing more than 20% of total blood volume leads to hemorrhagic shock. In evaluating the data from this study, only 93 (41.5%) of the teachers gave an accurate answer of applying direct pressure when they faced bleeding and it was low from Turkish [9] and Palestine [17] studies indicating basic first-aid courses must be given to the teachers in Ethiopia.

Regarding first aid measures for epileptic patients, the most and the least correctly answered items were making safe environment 116 (51.8%) and unresisting the patient 18 (8%) respectively. The finding was inconsistent with Turkish [15] and Palestine [17] studies indicating the need for urgent first aid training in Ethiopia. A great proportion 172 (76.8%) of primary school teachers were unknowledgeable about first aid measures which was much higher compared to different reports of inadequate knowledge (51.26%) in Saudi Arabia [18], (13%) in Mangalore south India [19], (26%) in Yenepoya India [20], (10%) in Punjab India [21], (29%) in palestine [17] and (5%) in Iraq [13]. The reason behind this finding may be explained by the lack of training and the absence of compulsory first aid courses in the teaching curriculum in Ethiopia. Teachers in the age group 41-50 years and work experience of more than 15 years were identified as more knowledgeable about first aid measures even if there was no statistically significant association and the finding was in line with a similar study undertaken at Mangalore, South India [19], Iraq [13] and Turkey [15]. The reason might be due to when

the age and work experience of the teachers increase, they may have more experience to manage different accidents.

The current study findings presented that, there was a significant relationship between teachers' level of education and overall knowledge of first aid measures as the level increase the knowledge also increase and it is in line with Iraq [13], Egypt [14], and Saudi Arabia [18] studies. The reason might be due to those Bachelor's degree teachers having first aid education and training programs in Universities than diploma teachers indicating the need for the curriculum at college levels. Receiving training in first aid was the factor that significantly affect the level of knowledge in this study. The finding was supported in many studies for example in Saudi Arabia [18] and in India [19], a significant association was found between first aid training and better knowledge level. This emphasizes the need for training at least on an annual basis for all primary school teachers.

Conclusion

Knowledge about first aid measures is not satisfactory among primary school teachers in Ethiopia. This is largely due to a lack of training. So, first aid education and training programs should be introduced at school and college levels for the early management of injuries and emergencies. Moreover, first-aid knowledge and skill should be incorporated into the educational curriculum of primary school teachers.

Limitation of the study

Since the study design was cross-sectional, it is difficult to establish a sequential relationship between teachers' knowledge of first aid measures and descriptive variables. Further, a short study period limited us to take a large sample size. This study was also limited because teachers' skills in implementing first aid measures were not determined.

Declaration

Consent for publication: Not applicable.

Availability of data and materials: All data generated or analyzed during this study are included in this publication. We sent all available data; there is no remaining data and materials.

Competent interests: The authors declare no conflict of interest.

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Authors' contribution: FT and WJ conceived of and designed the study, participated in data collection, analyzed the data, and drafted the paper. FT and WJ critically reviewed the study protocol, participated in data acquisition and analysis, and reviewed the draft manuscript. Both authors read and approved the final manuscript.

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