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Preparedness for handling injuries by female primary school teachers: A cross-sectional survey in Southwestern Saudi Arabia

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ABSTRACT

Objective: To assess the preparedness for handling injuries by female primary school teachers based on their knowledge, attitude, practice and their willingness to learn first aid.

Methods: A cross-sectional questionnaire on first aid was provided to female primary school teachers, and the knowledge, attitude, practice and their willingness to learn first aid were investigated. Data were analyzed using SPSS version 23. Quantitative data were analyzed by one-way ANOVA, categorical variables were analyzed by the *Chi-square* test. The level of significance was set at $P<0.05$.

Results: In total, 464 teachers of different age groups and education responded. The mean knowledge score was low but the mean attitude score was high. Parental consent was sought by one-fourth of the teachers, and 25.6% of teachers documented the health status of children. Most of the teachers desired to have a first aider, and they were keen on training (62.3%) and educating children (88.1%) on first aid. Knowledge scores were significantly impacted by age ($P<0.05$) and experience ($P<0.01$), while specialization impacted mean practice scores ($P<0.001$). Teachers' qualification ($P<0.05$), first action to be taken at the accident site ($P<0.05$), and frequency of training ($P<0.05$), were significantly associated with the need of a first aider.

Conclusions: Based on the paucity of awareness and expertise, on priority basis, it is important to strengthen teachers' skills. Child safety is an important public health issue and can be improved by educating and training teachers.

1. Introduction

Children undeniably sustain injuries, and school appears to be one of the common locations where the injuries occur. School children are vulnerable to minor as well as major accidents ranging from simple cuts, splinters, muscle sprains, nose bleeding, lacerations, and fractures. The most important course of action could be providing expeditious first aid to avoid fatalities, which can prevent deterioration of health, as professional help and emergency medical services might take time to arrive at the site. A child spends an average of 180 d per year in school, and it would be legitimate to

be concerned about the safety of a child during this period[1]. The nature of risk exposure in schools is entirely different from home settings. Children can sustain injuries mostly during sports, break time, due to overexertion and choking[2]. Besides, children suffering from chronic diseases such as asthma and epilepsy need special attention.

Several school-based accidents have caused disability and loss of life in the Kingdom of Saudi Arabia. There are reports of injury in

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schools leading to mortality in children in Saudi Arabia, particularly in Mecca, Jizan, and Jeddah[3]. Around thirty percent of visits to the emergency department in hospitals in the United Kingdom is attributed to mishaps taking place in schools[4]. Another study reported over seventy lakh injuries in school settings for eight years[5]. Park *et al.* reported that in the United States alone, there were nearly eighteen lakh injuries sustained in schools within two years[6].

In case of accidents, the initial step would be to handle the situation by utilizing available resources. Accessibility to the first aid box, and the knowledge to use them effectively are vital in this situation. Also, most schools should employ a skilled first aider to manage casualties. However, keeping in perspective the quantum of students studying in schools, it will also be beneficial to equip teachers with first aid practice skills, as they would be the first to experience the untoward incident.

Sports activities have been recently introduced for girls, and scholastic education for females and males is completely segregated in Saudi Arabia; hence, it would be essential to understand female teacher's knowledge and skills on first aid. Despite this being a matter of great concern, there are very few studies to ascertain the awareness of female teachers to face challenging situations. Therefore, this study assesses teachers' knowledge, attitude, and practice regarding first aid. In addition, their willingness to undergo first aid education and training was also assessed.

2. Materials and methods

The Institutional Review Board of College of Pharmacy approved the study bearing number 5104/702/1439 dated 07/02/1439. and verbal informed consent was obtained from each participant after explaining the purpose of the study.

The study was a cross-sectional, descriptive design conducted between September 2017 and December 2017. The sampling frame consisted of primary Government schools for girls located in the four governorates in the southwest province of Saudi Arabia. Initially, a list of schools was prepared based on the information available in the Ministry of Health official site. Thirty-two schools were randomly selected from the list of schools using random numbers generated in Microsoft Excel. Saudi female primary school teachers were included in the study, and male teachers were excluded. The questionnaire was initially formulated in English and translated to Arabic for easy comprehension of the Saudi teachers. A subset of teachers were requested to complete the questionnaire to identify unclear questions and revise the questionnaire accordingly.

The sample size estimated was 357 based on the 95% confidence interval, 50% prevalence, and a 5% margin of error. In order to account for non-responders, an additional 15% were included in the study.

The questionnaire was categorized into four sections, with the first

section retrieving demographic information such as age, experience, qualification, and specialization. Section two, three and four had specific questions evoking dichotomous answers. These questions were scored one for the correct answer and zero for the incorrect answer. In addition, these sections also contained questions related to first aid which were addressed separately and were not included in the score. Section two contained 13 questions assessing specific knowledge on first aid encompassing the management of burns, fractures, insect stings, choking, bleeding including epistaxis, poisoning, electric shock, cardiac complications, awareness of the role of a first aider and steps taken in an emergency. In addition, the other related questions assessed the source of first aid information, frequency of accidents, and accessibility of the first aid kit. The third section assessed attitude towards first aid with four specific questions. They included the person responsible for performing first aid, and willingness to perform first aid which was scored zero and one for the incorrect and correct answer respectively. The related questions assessed the willingness of teachers to learn about first aid, frequency of training required, need of a first aider and parental consent. Section four assessed specific first aid practices such as action to be taken during an emergency, and steps involved in performing first aid which was scored one for the ideal answer and zero for the incorrect answer. The additional questions mainly focused on checking expiry of the first aid kit, display of the emergency call number, training provided in schools and fostering first aid skills in children. Total scores for the three sections computed for the individual domains were 13, 4 & 4 respectively.

Data were coded, entered in Microsoft Excel, and analyzed using SPSS Statistics for Windows, Version 23.0. All the categorical variables were represented as frequency and percentage, and analyzed by Pearson *Chi*-square test or Fisher's exact test. The Kolmogorov-Smirnov test was used to determine normality of quantitative data, analyzed by ANOVA and represented as Mean±SD. The level of significance was set at $P<0.05$.

3. Results

Four hundred and sixty-four female primary school teachers responded to the questionnaire, of which 23.1% were between 20-29 years of age, 63.6% were between 30-39 years, and 13.4% were above 40 years. Nearly 60% had 1-10 years of experience, 32.8% with 11-20 years and 7.6% with longer than 20 years' experience. More than half of them had a bachelor's degree (53.0%), 33.4% were diploma holders and 13.6% held a master's degree. The majority of the respondents were language teachers which included English and Arabic (39.9%), 16.8% taught Islamic studies, 14.9% were mathematics teachers, 21.1% taught science, and 7.3% taught social studies (Table 1).

Table 1. Demographic characteristics of female school teachers.

Demographic information	n(%)
Age (years) (n=464)	
20-29	107 (23.1)
30-39	295 (63.6)
≥40	62 (13.4)
Experience (years) ^b	
1-10	276 (59.6)
11-20	152 (32.8)
>20	35 (7.6)
Qualification (n=464)	
Masters	63 (13.6)
Bachelors	246 (53.0)
Diploma	155 (33.4)
Specialization (n=464)	
Languages	185 (39.9)
Islamic	78 (16.8)
Mathematics	69 (14.9)
Social studies	34 (7.3)
Science	98 (21.1)

^b number not equal to 464 as it contains missing data.

Table 2. Knowledge of female primary school teachers regarding first aid.

Variables	n(%)
Heard of first aid (n=464)	
Yes	457 (98.5)
No	7 (1.5)
Source of first aid information (n=464)	
Digital media	343 (73.9)
Books	65 (14.0)
Health care professionals	56 (12.1)
Identify emergency call number (n=464)	
Correctly	404 (87.1)
Incorrectly	60 (12.9)
Frequency of accidents ^b (n=456)	
Once a week	75 (16.4)
Once in a fortnight	228 (50.0)
Once a month	153 (33.6)
Accessibility of first aid kit ^b (n=459)	
Easily accessible	204 (44.4)
Takes time to be accessed	211 (46.0)
Difficult to access	44 (9.6)

^b number not equal to 464 as it contains missing data.

Over ninety-eight percent of respondents heard about first aid. Digital media served as the primary source of information about first aid for 73.9% of teachers, 14.0% obtained information from schoolbooks, and 12.1% from healthcare professionals. Nearly 87.1% of the teachers identified the emergency call number in Saudi Arabia correctly. The frequency of accidents was the highest once in a fortnight (50.0%), once a month (33.6%) and once a week (16.4%). Easy accessibility of the first aid kit was reported by 44.4% of the teachers whereas 46.0% said it would take time, and 9.6% felt that it was inaccessible (Table 2).

Most of the teachers were interested in first aid (98.9%), and most had realized the importance of learning first aid as a subject in higher education (90.3%). Most of the teachers thought that they should take training every year (62.4%). Nearly eighty-one percent affirmed the need for a skilled first aider. Eighty-two percent expressed that sports activities were vital and about 69.9% collected the contact

Table 3. Attitude and practice of female teachers regarding first aid.

Variables	n(%)
Interested in first aid (n=464)	
Yes	459 (98.9)
No	5 (1.1)
Willing to learn first aid in higher education (n=464)	
Yes	419 (90.3)
No	45 (9.7)
First aid training required ^b (n=463)	
Every three years	68 (14.7)
Every two years	95 (20.5)
Every year	289 (62.4)
Not required	11 (2.4)
Skilled first aider (n=464)	
Always needed	374 (80.6)
Sometimes needed	73 (15.7)
Never needed	17 (3.7)
Importance of sports ^b (n=462)	
Sports activities always important	381 (82.5)
Sometimes important	81 (17.5)
Do you take parental consent to engage children in sports (n=464)	
Always	124 (26.7)
Sometimes	290 (62.5)
Never	50 (10.8)
Need to collect the contact number of parents ^b (n=461)	
Yes	321 (69.6)
No	140 (30.4)
Training students (n=464)	
Yes, will provide training to student's	409 (88.1)
No, not interested	55 (11.9)
Expiry date of first aid kit ^b (n=463)	
Checked once a month	180 (38.9)
Checked once in six months	184 (39.7)
Checked once a year	99 (21.4)
School provides first aid training (n=464)	
Yes	174 (37.5)
No	290 (62.5)
Display emergency call number ^b (n=459)	
Yes	262 (57.1)
No	197 (42.9)
Disease status documented in schools (n=464)	
Yes	119 (25.6)
No	345 (74.4)

^b number not equal to 464 as it contains missing data.

Table 5. Association of female teachers' attitude towards first aider with several factors.

Variable	Need of first aider	
	χ^2 (df) or Fisher's exact value	P-value
Age	1.12 (2) ^a	0.582
Qualification	15.72 (4) ^a	0.005
Specialization	6.97 ^b	0.498
Step taken in an emergency	6.76 ^b	0.295
Frequency of accidents	9.33 ^b	0.127
First action at accident site	19.76 ^b	0.002
Frequency of training	16.01 ^b	0.030

^a χ^2 ; ^b Fisher's exact test.

number of parents. Obtaining parental consent to engage students with outdoor activities was always considered by 26.7% teachers; whereas, 62.5% and 10.8% felt that consent was sometimes or never required respectively (Table 3).

Table 4. Association between demographic variables with mean knowledge, attitude and practice scores of female teachers.

Variables	Knowledge score		Attitude score		Practice score	
	Mean \pm SD	P value	Mean \pm SD	P value	Mean \pm SD	P value
Age (years)						
21-29	4.00 \pm 1.54	0.05	3.42 \pm 0.74	0.350	2.53 \pm 1.01	0.139
31-39	3.69 \pm 1.54		3.50 \pm 0.63		2.41 \pm 1.10	
\geq 40 years	4.14 \pm 1.80		3.53 \pm 0.53		2.43 \pm 1.06	
Experience (years) ^b						
1-10	3.66 \pm 1.55	0.011*	3.47 \pm 0.67	0.723	2.43 \pm 1.06	0.118
11-20	4.11 \pm 1.64		3.50 \pm 0.59		2.44 \pm 1.06	
>20	3.81 \pm 1.64		3.53 \pm 0.64		2.70 \pm 1.06	
Qualification						
Masters	3.85 \pm 1.47	0.934	3.42 \pm 0.71	0.240	2.38 \pm 1.16	0.159
Bachelors	3.79 \pm 1.54		3.46 \pm 0.65		2.43 \pm 1.04	
Diploma	3.84 \pm 1.58		3.55 \pm 0.62		2.60 \pm 1.06	
Specialization						
Languages	3.99 \pm 1.51	0.083	3.46 \pm 0.72	0.476	2.56 \pm 1.12	0.001*
Islamic	3.59 \pm 1.57		3.57 \pm 0.55		2.45 \pm 0.77	
Mathematics	3.98 \pm 1.55		3.42 \pm 0.65		2.14 \pm 1.05	
Social studies	3.76 \pm 1.77		3.52 \pm 0.55		2.34 \pm 1.16	
Science	3.51 \pm 1.66		3.53 \pm 0.59		2.84 \pm 1.09	

* $P < 0.05$, ^b number not equal to 464 as it contains missing data.

Majority (88.1%) of the teachers were positive towards training students to manage critical situations. In terms of training provided in schools, 62.5% responded in the negative. About one-fourth of the teachers (25.6%) documented the disease status of children in schools. In response to the need of checking the contents of the first aid kit for expiry, 38.9% expressed that it has to be checked once a month, 39.7% said that it needs to be checked once in six months, and 21.4% said that it needs to be checked once a year. Nearly forty-three percent of the teachers revealed that the emergency call number was not displayed in their schools (Table 3).

Mean scores attained for the knowledge, attitude and practice domains are shown in Table 4. Comparison of mean scores attained by primary school teachers regarding first aid knowledge, attitude, and practice were made against the demographic variables. Knowledge scores were significantly impacted by experience ($F=3.77$, $P=0.011$). Similarly, one way between effects ANOVA revealed a statistically significant effect specialization had on practice score ($F= 3.18$, $P= 0.001$).

The need of a first aider was significantly associated with qualification of female primary school teachers ($\chi^2=15.72$; $P=0.005$), the first action to be taken at the site of an accident (Fisher's exact value=19.76; $P=0.002$) and the frequency of training (Fisher's exact value=16.01; $P=0.03$) (Table 5).

4. Discussion

In this study, we were able to assess the knowledge, attitude, and practices among female primary school teachers in public sector schools in South-Western Saudi Arabia.

Accidents can occur regularly in schools as large numbers of

children engage in a similar type of activity simultaneously. Sports-related injuries are by far the most commonly occurring cases in schools; however, schools in Saudi Arabia for female students had limited physical education owing to cultural and ideological reasons[7,8]. Their perspectives have been currently modified with permission to implement a few sports activities. Hence, the probability of children with no prior exposure to sports getting injured could be high. Thus, constant supervision of the students is a pre-requisite to minimize accidents. Also, over eighty percent of the female teachers felt that physical activities are vital for girl-students, an important finding, as outdoor sports activities for girls have been introduced recently in the Kingdom of Saudi Arabia. Sports activities provide myriad of favorable outcomes; yet, it would be appropriate to obtain parental consent before engaging children in outdoor sports activities, as they would be familiar with the health status of their child. However, we found that parental consent was considered only by about one-quarter of the teachers; whereas the vast majority felt that it was not an absolute requirement, and around 11% did not feel the need at all. Children suffering from disorders such as epilepsy, asthma, juvenile diabetes, and cardiovascular conditions would require limited physical activity, as any factor can trigger an episode of attack. Hence, involving parents as decision-makers can improve child safety in special cases.

By far, most of the female primary teachers in our study knew of first aid, which was mainly gained from digital media. It is important to emphasize that knowledge obtained from social media may be theoretical; however, to be competent during a crisis, practical skills need to be developed. Therefore, health care professionals should be at the forefront to educate and train teachers about first aid.

Documentation of the health status of a child is generally undertaken at the admission stage of a child to school; however,

this information needs to be delivered to the teachers. Surprisingly, nearly three-quarters of the teachers admitted that documentation of diseases was poor in their school. This feedback might be because the teachers do not receive information from the school authorities regularly. Therefore, reforms and statute requirements need to be introduced to document the health status of children in schools and update the in-charge teacher with information periodically-a measure that will certainly minimize the burden of accidents.

The overall knowledge and practice level scores of the teachers were poor; however, their attitude towards first aid was high. This agrees with a study done in the Kingdom and another in Ethiopia reporting poor first aid knowledge[9,10]. However, this finding disagrees with other studies projecting the knowledge level of teachers to be 68.4%. This may partially be attributed to the survey being conducted on female teachers which is different from other studies. Moreover, as many of the teachers were engaged in teaching languages and religion, their interest in gaining knowledge about first aid could be limited resulting in this outcome. Nonetheless, their ability to decide on a befitting action to be taken in case of injury suggests that the teachers have an adequate background of first aid.

An association was found between the first actions to be taken during an emergency, frequency of first aid training and teachers' qualification with the need of having a trained first aider in schools. Lack of skills to perform the tasks on their own plausibly led to them feeling the need of a first aider. Unfortunately, nearly two-thirds of the teachers admitted that they do not have formal training on first aid in schools. Hence, on a priority basis, both publicly and privately funded schools should provide training to its teaching faculty as they could encounter untoward incidents when children engage in sports activities or are left unattended during recess. Conducting periodic training in first aid can tremendously improve their confidence to perform these tasks.

Over forty percent of the teachers in this study admitted that the emergency call number was not displayed in their schools. Also, nearly forty-five percent of the teachers acknowledged that it would take them time to get access to first aid kits in their campus. Fortunately, nearly ninety percent of the teachers identified the emergency number correctly. Hence, despite lacunae in the system, the inherent knowledge teachers possess can avoid a delay in calling emergency services. Greater emphasis must be given to training as it was found that a few teachers failed to identify the emergency number correctly. An essential prerequisite of risk management in schools and public places is to display the emergency call number, as accidents occur without warning. Teachers provided a favorable response regarding periodic inspection of the first aid kit for expiry and depletion of the contents.

Most of the teachers were extremely positive towards introducing a subject on first aid in the curriculum and training children on practical skills. The benefits of first aid training are inestimable and

should be introduced in the school curriculum. In the school system in Denmark, first aid is a part of their curriculum[11,12]. Bollig *et al.* have reported that 6-7 year-old children could perform first aid after a few training sessions[13]. Another study found that 6-7 year-old were trained to provide first aid during cardiac complications, stressing the need of including this in the curriculum[14]. Health enhancement could be considered a valuable tool empowering a child earlier in life to undergo training, thus building a life-long asset in children.

The self-administered questions were general rather than specific. The exclusive categories of medical emergencies were not included because knowledge of such conditions should be evaluated practically. This survey was done mainly on female teachers in schools for girls although, first aid is equally important for boys and girls. This study reflected the areas in which the female primary school teachers need training and lack knowledge. It could also serve as an eye-opener for the policymakers to improve safety measures in schools.

Primary school teachers need to be adequately trained to manage casualties independently until they receive emergency help. This is important keeping in mind that physical education for girls has been introduced recently in the Kingdom of Saudi Arabia, and schools for girls and boys are segregated. Digital media and books have been a source of information to the teachers; however, management of sudden injuries will require appropriate expertise which can be achieved through periodic refresher courses offered to the teachers. Greater involvement of healthcare professionals in imparting practical training is desirable. Schools located in remote areas, where medical facilities are limited or not easily accessible, will tremendously benefit from this initiative. Developing, implementing and periodic monitoring of emergency measures in primary schools in the country will improve safety, and prevent permanent disability, complications, and even the chances of death of school children.

Conflict of interest statement

The authors report no conflict of interest.

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Authors' contribution

H.A.M designed and conducted the study and contributed to the

concept of this study; A.A.A. designed and conducted the study and contributed to the manuscript writing; O.J.F.B designed, conducted and analysis the study; S.M. contributed to the collection of data, training of enumerators, manuscript writing; A.M. contributed to the design and statistical analysis of the study; S.A. conducted the study and contributed to the compiling and manuscript writing; A.A.M. contributed to the manuscript writing and editing of the study; D.B. contributed to the compiling data, manuscript writing and editing of the study.

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