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Knowledge, attitude and school preparedness of first aid among kindergarten teachers in Makkah, Saudi Arabia: A comparative cross-sectional, analytical study

Reham Naif Bin Hassan[1]✉, Muhammad Irfanullah Siddiqui[2], Yasmeen Ismail Barmawi[1], Bashaier Ahmad Fairaq[1]

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Author Affiliation:
[1]MBBS, R3 joint program of preventive medicine, Makkah Mukarramah, Saudi Arabia
[2]Prof. Department of community and pilgrim services, Faculty of medicine, Umm Al-Qura University, Makkah Mukarramah, Saudi Arabia

✉**Corresponding author**
MBBS, R3 joint program of preventive medicine, Makkah Mukarramah,
Saudi Arabia;
Email: Missrolita74@gmail.com

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ABSTRACT

Aim: This study aimed to assess the level of knowledge, attitude, and school preparedness of first aid among kindergarten teachers in Makkah, Saudi Arabia. *Method*: A comparative Cross-Sectional, Analytical Study was conducted among 582 kindergarten teachers working in Makkah Al Mukaramah city from November 2019- January 2020. Data were collected using a self-distributed questionnaire. *Result*: Knowledge level was reduced among 58.2% of the teachers, with a mean score of 11.66±3.84. On the other hand, the majority 90% of the teachers showed a positive attitude with a mean score of10.19±3.07. More than half of the schools had poor school health services (56.0%), with a mean score of 5.06±1.77. *Conclusion*: The current study shed light on the poor level of knowledge about first aid among kindergarten teachers, as well as the shortage of healthcare services in the schools, even that the majority of the teachers had high positive attitude, particularly the importance of learning first aid and having adequate first aid services in schools. *Recommendation*: There is need for further nation-wide studies on assessment of kindergarten teachers' knowledge and attitude regarding first aid in schools on larger sample sizes and regions other than Makkah Al-Mukarramah.

Keywords: Kindergarten teacher, first aid, knowledge, attitude, school health services

1. INTRODUCTION

On average more than 12,000 children die each year in the United States (US) from an unintentional injury. And approximately nine million children are

receiving treatment in emergency departments of the hospital for nonfatal injuries (Borse et al.,2009). An estimated 1,859,215 injuries occurred at school, visiting the emergency department every year in the US. Most cases related to school injury were always treated and discharged from the emergency department 98%, and only 1% were under observation or needed an admission (Linakis et al., 2006). A study conducted in India continued for three years, showed that pediatric trauma cases come to the hospital with fatal injury outcome was 8.85%, and duration of hospital stay with a median of 1 day. The most common age for trauma fall-down was less than six years old (122, 38.13%) (Lalwani et al., 2014).

WHO recommended first aid as a cost-effective way to prevent emergency injury. First aid is defined as: "the immediate act and response to manage any trauma injury till the professional person comes and manages the situation"(Safe B, 2014). It's a provider of care carried out for life-saving make an assessment and interventions with or without a medical tool (Kumar etal., 2013). The Occupational Safety and Health Administration (OSHA) defined first aid as "medical service that is given immediately after the accident occurs at the same time and location. It often consists of a one-time, short-term treatment and requires little technology or training to administer"(Medical and First Aid, 2020). Therefore, it's essential to have a general knowledge of first aid. The primary goal of first aid is to stop or prevent any harm occurring at injury time before getting medical care under the supervision of health professionals (Occupational Safety and Health Administration, 2011). First aid knowledge is processes and skills that used to prevent and act immediately on emergencies. It can be happening anywhere and anytime, such as home, schools, office, and public places (Federation of Red Cross and Red Crescent Societies, 2008).

Providing health and education services for all people is one of the essential goals for the World Health Organization (WHO), especially for children to achieve Millennium Development Goals by 2030 (Assembly et al., 2015). Moreover, Saudi Arabia's vision of 2030 is now starting national transforming programs. One of the components of this vision is to provide an education that builds our children in a safe, healthy environment and focuses on promoting preventive care. Ensure that all children and adolescents receive a high quality of learning (Al-Hanawi et al., 2019; Salman et al., 2018). A qualitative study showed that accidental child injuries might result from the perception that some injuries were a likely part of child development. Initiators for damage may be diminished by teaching children about injury risks and supervision (Baratpour and Bami, 2012). The children are at high risk for a lot of accidents and life-threatening situations; the most common injuries occur, such as epistaxis, burn, choking, fall, and fracture (Abernethy et al., 2003).

Regarding the American Academy of Pediatrics, There is a guideline for emergency cases that occur at school time. The recommendations are; 1. Any emergency case that occurs in school should be handled by professional staff (nurse or an educated person). 2. Every school must have a clear protocol for emergency and availability of emergency kit. 3. Documentation of all student information related to any health problem, medication, and emergency contact numbers. 4. Continue education for school staff under the supervision of certified health professionals for life-saving courses such as Basic Life Support (BLS), First Aid (1st Aid) (Powell & Prober, 2012).

A study carried out in a Slovenian kindergarten teacher and teacher assistance showed that they are well aware of the importance of health knowledge among children, and regarding attitude toward 1st aid that is important to learn health knowledge all of them agreed to acquire (Slabe et al., 2016). The majority of studies took place in Africa, (Witek-Mcmanus et al., 2015; Ganfure et al., 2018; Simatwa et al., 2018) in southern Malawi for intervention and training conduct that combination of continuous teacher training, supervision, and support can be useful among school teacher knowledge and practice of essential management of sicknesses and wounds. In Ethiopia, a study carried out among kindergarten teachers showed low scores of first aid knowledge. However, a high positive attitude which positively related to socio-demographic character and previous training of first aid (Ganfure et al., 2018).

In Asian countries, majority of studies for first aid knowledge showed a deficiency of necessary information and expertise in life-threatening conditions among kindergarten teachers, and recommend to encouraging teachers for first aid training programs (Li et al., 2012; Lee et al., 2010). Where most school teachers have a positive attitude and willingness to learn and practice first aid for emergency conditions, especially at school (Li et al., 2014; Joseph et al., 2015; Qureshi et al., 2018). The majority of studies conducted among school teachers showed statistically significant improvement in teacher awareness and skill after educational intervention programs, continuous education and training programs about first aid and trauma management were essential for all school teachers (Abdella et al., 2015; Mersal et al., 2016; Awad et al., 2016; Ahmed et al., 2017; El magrabi et al., 2017; Rn Amro et al., 2017).

Studies conducted among school teachers in different regions of Saudi Arabia showed a low level of knowledge and skills of first aid. However, the majority of the teacher's attitudes toward first aid and Basic Life Support (BLS) were positive, and they are willing to have more training for first aid (Al Samghan et al., 2015; Younis, 2015; Soliman Behairy & Al-Batanony, 2016; Al Enizi et al., 2016; Alenezi et al. 2020; Alduraywish et al. 2020). Regarding all those studies carried out worldwide, we found that lack of

knowledge, which affects the role in preventing injury and life-threatening conditions, occur for children at school. There is inadequate information about the management of child injury during school time and teacher knowledge in Saudi Arabia. So far, we didn't find any study assessing the level of knowledge, attitude, and school health preparedness of first aid among kindergarten teachers in the Kingdom of Saudi Arabia.

We aimed to measure the level of knowledge, attitude, and school preparedness of first aid among kindergarten teachers in Makkah, Saudi Arabia.

2. METHODOLOGY

This study was a comparative, analytic cross-sectional Study conducted among Saudi teachers, in private and governmental Kindergarten, in Makkah Al-Mukarrmah, from November 2019- January 2020. We used an epi-info sample size calculator to estimate the sample size in two arms. The level of significance was set at 5%, Confidence interval as 95%, the beta error as 20%, the power as 80%; the expected effect size was 0.2. The sample size was 582 teachers in Kindergarten. After a 10% non-response rate added, the total sample size became 640 teachers from private and governmental Kindergarten in Makkah, Saudi Arabia. First, divide the Kindergarten into the private and governmental sectors. Then, we used the simple random sample to select fifty percent 50% of the private and governmental Kindergarten.

A self-distributed questionnaire contains four parts. The first part includes questions of the socio-demographic characteristic (age–a service year– training of first aid), and general information about first aid. The second part contains twelve 12 questions to assess knowledge of first aid. The third part with seven items is to evaluate the attitude. The knowledge and attitude parts were obtained from the previous validating questionnaire used in Lideta sub-city Addis Ababa, Ethiopia study (Ganfure et al., 2018). The last part related to school health services items was obtained from previous validating questionnaires of a study conducted in Western Nigeria (Kuponiyi et al., 2016). Three expert epidemiologists checked content validity. The English version of the questionnaire was translated into Arabic by experts.

The study initiated after obtaining ethical approval from the local research committee of the preventive medicine program in Makkah, Saudi Commission of Health Specialty, and the Ministry of Education in Makkah city.

Study Variables

Independent: Sociodemographic data.

Dependent: teacher knowledge of first aid.

Data entry and analysis

We used software SPSS ver. 22 for entering, editing, and cleaning of data, followed by analysis. Categorical data were analyzed with proportion, quartiles and percentages, and numerical data with mean, standard deviation and median. To compare the difference between median, we used the Mann Whitney U test and Kruskal Wallis test, where data were nonnormal distribution. For knowledge question score of mean and above reflected as knowledgeable, and for rating less than mean indicated as non-knowledgeable. Questions that assess kindergarten teacher attitude of first aid measure by using Likert scale, for positive attitude such as strongly agree to give a score of 2 and for agree giving a score of 1, and for negative attitude give score -1 for disagree and -2 for strongly disagree. Then dichotomize the data for each question into a positive attitude and negative attitude, and the cut-off point for overall attitude ninety percent and above. The level of significance was set at 5%.

3. RESULT

Out of 582 kindergarten teachers, the average age was 34.78±7.76 years. The majority of 517 (88.8%) had a bachelor's degree, with a median score of 7 years of services. More than half 326 (56.0%) were married. Less than half 234 (40.2%) worked in private Kindergarten while 348 (59.8%) worked in governmental schools. Less than half 242 (41.6%) had training on first aid, (Table 1).

Table 1 Demographic data of participants

	Variable	N	%
Region	center	101	17.4
	west	156	26.8
	north	89	15.3
	east	115	19.8

	south	121	20.8
Educational level	Diploma	46	7.9
	Bachelor's	517	88.8
	Masters	14	2.4
	other	5	.9
Marital status	Married	326	56.0
	Single	180	30.9
	Divorced	67	11.5
	Widowed	9	1.5
School type	Government	348	59.8
	Private	234	40.2
Attending a training program	Yes	242	41.6
	No	340	58.4
Variable		Mean± SD Range	Median Quartile (25,75)
Age		34.78±7.8 (28-54)	35 (28,40)
Service years		7.07±6.5 (0-29)	7 (1,9)

Data were presented as number (%), or as Mean ± SD, or as median (quartile)

The results revealed that 429 (73.7%) heard about first aid, where the main sources of knowledge were health professionals with117 (20.1%), followed by media with 110 (18.9%), then books and health institutions equally 59 (10.1%). More than half 334 (57.4%) reported that they didn't face any situation which required first aid. The majority of 502 (86.3%) stated the correct definition of first aid, (Table 2).

Table 2 Comparing first aid general information between governmental school teachers and private school teachers

Variable	Total N	%	Governmental school N	%	Private school N	%
Heard about first aid						
Yes	429	73.7	258	74.1	171	73.1
No	150	25.8	88	25.3	62	26.5
Unknown	3	.5	2	.6	1	.4
Source of information						
Family	11	1.9	6	1.7	5	2.1
Books	59	10.1	31	8.9	28	12.0
Media	110	18.9	71	20.4	39	16.7
Health professionals	117	20.1	76	21.8	41	17.5
Health institution	59	10.1	33	9.5	26	11.1
Other	91	15.6	52	14.9	39	16.7
No	135	23.2	79	22.7	56	23.9
Facing a child need first aid						
Yes	248	42.6	176	50.6	72	30.8
No	334	57.4	172	49.4	162	69.2
Definition						
a. The immediate care is given for a person who sustained an injury or accident before the victim arrives health institution						

	502	86.3	298	85.6	204	87.2
b. The immediate care is given for a person who sustained an injury or accident in a health institution.						
	5	.9	5	1.4	0	0
c. The immediate care is given for a person who sustained an injury or accident by a health professional.						
	23	4.0	16	4.6	7	3.0
d. The immediate care is given for a person who sustained an injury or accident at the emergency department of a tertiary hospital						
	8	1.4	4	1.1	4	1.7
e. I don't know						
	44	7.6	25	7.2	19	8.1

Data were presented as number (%)

Regarding the type of injuries/accidents need first aid in Kindergarten, the results revealed that the most common types were choking by 462 (79.4%), followed by nose bleeding by 448 (77.0%), then breathing difficulty by 383 (65.8%), fainting by 361 (62.0%), and bleeding by 339 (58.2%), (Figure 1). The most common correct knowledge and the less common were presented in (Table 3). Figure (3) revealed attitude towards first aid in Kindergarten, where all the seven attitudes had a high positive rate (>90.0%).

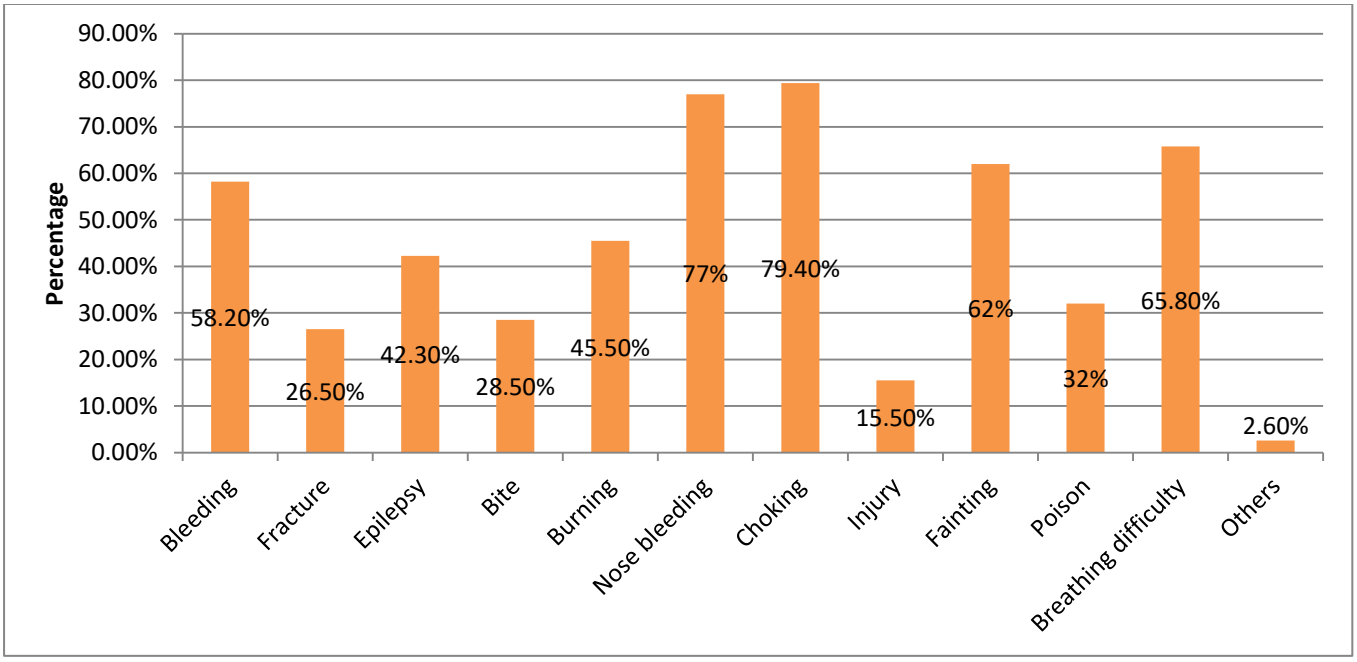

Figure 1 Type of injuries/accidents need first aid in kindergarten

Table 3 Knowledge level of first aid among kindergarten teachers

Variable	N	%
One measure to stop bleeding is pressing firmly with clean bandage on the bleeding part . "True ^^	428	73.5
One of the first aid measures for epileptic child is keeping air way clear by placing the child on the side. "True^^	267	45.9
One of the first aid measures for epileptic child is keeping air way clear by lying down the child . "False^^	105	18.0
Standing behind the child and hitting on the back by hands is the first aid measure for choking child. "False^^	253	43.5

Standing behind the child encircling the child's chest by hands and squeezing is the first aid measure for choking child . "True^^	455	78.2
For child with neck and back injury avoiding head and neck movement and keeping body straight is one measure of first aid. "True^^	481	82.6
In case child has bitten by his friend, cleansing wound with soap and water for 5 minutes is one measure of first aid for human bite . "False^^	154	26.5
One of the first aid measures for nose bleed/epistaxis is placing student sitting comfortably with slightly forward and applying uninterrupted pressure by pressing nostrils together. "True^^	381	65.5
One of the first aid measures for nose bleed/epistaxis is placing student lying down comfortably and applying ice on forehead and nose. "False"	235	40.4
Encouraging the child to sit quietly, breath slowly and deeply in through the nose and out through the mouth is first aid measure for the child with difficulty of breathing . "True"	428	73.5

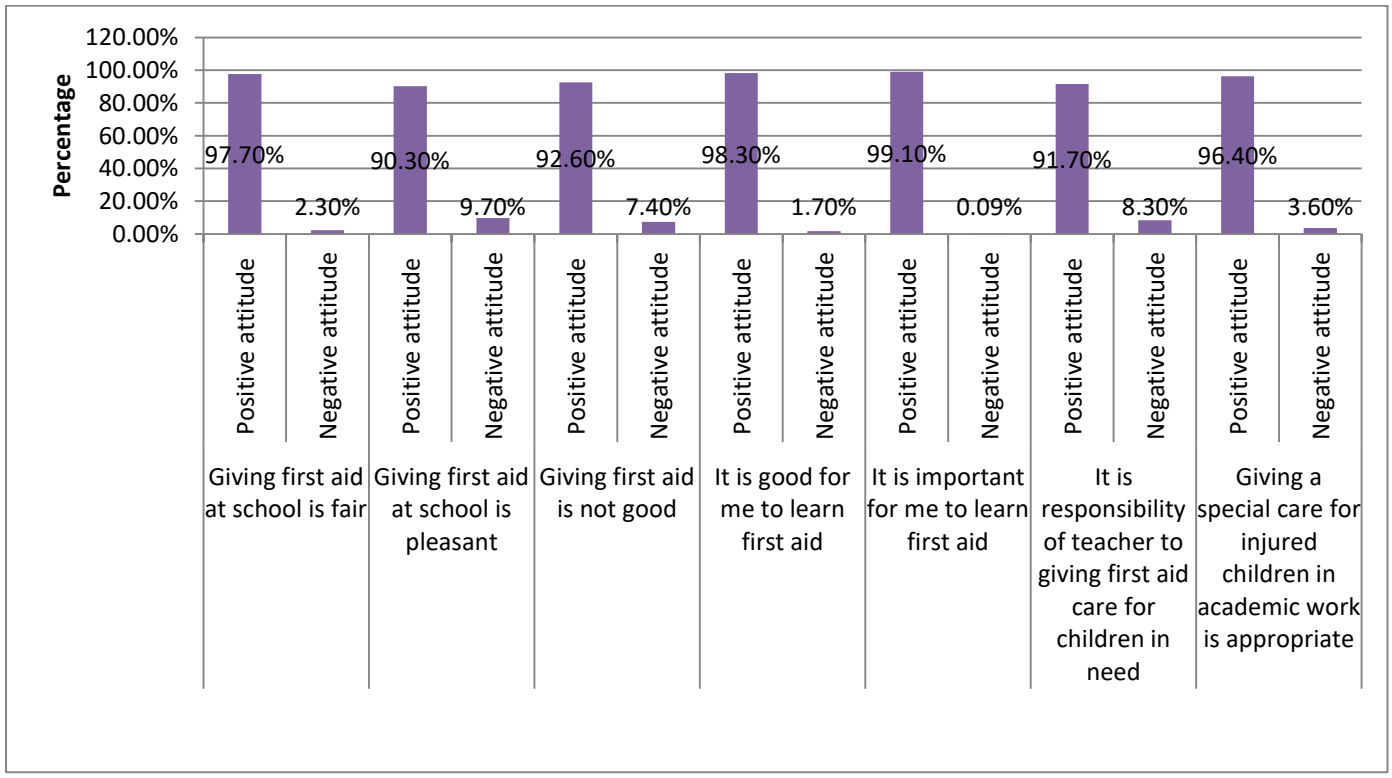

Figure 3 Attitude towards first aid among kindergarten teachers

The results in figure (4) revealed the school health services of Kindergarten towards first aid. The result revealed that the mean score of knowledge, school health services, and total scores was (11.66±3.84), (5.06±1.77), and (26.92±5.75), respectively. Where more than half had poor knowledge, 317 (54.5%), poor school health services 401 (68.9%), and poor total score of 321 (55.2%). While the mean score of attitude was (10.19±3.07), indicating a high positive attitude. There was a significant relationship between attitude score and school type, where those who work in private Kindergarten had a more positive attitude than those who work in

governmental kindergarten (p<0.0001). On the other hand, there was no significant relationship between school type and knowledge score, school health program score, and the total score (p>0.05), (Table 4).

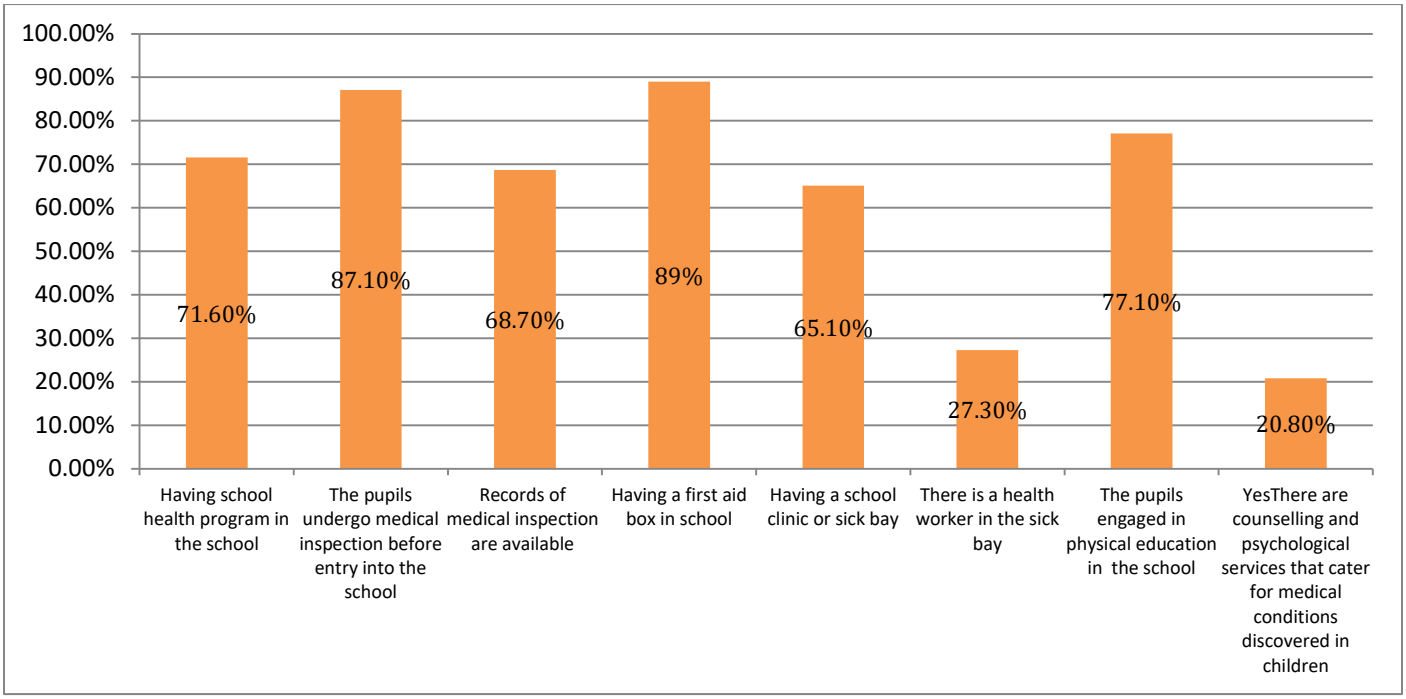

Figure 4 School health services of kindergarten towards first aid

Table 4 Total score of knowledge, attitude, school health services, and overall score

Variable		Total		Governmental school		Private school	
		Mean± SD Range	Median Quartile (25,75)	Mean± SD Range	Median Quartile (25,75)	Mean± SD Range	Median Quartile (25,75)
The total score of knowledge		11.66±3.8 (0-21)	12 (9,14)	11.7±3.8 (0-20)	12 (9,14)	11.6±3.9 (1-21)	12 (9,14)
		P=0.430					
The total score of attitude		10.19±3.1 (0-14)	11 (8,13)	9.8±3.2 (0-14)	10 (8,12)	10.8±2.8 (1-14)	10 (8,12)
		p<0.0001**					
The total score of school health		5.06±1.8 (0-8)	5 (4,6)	5.03±1.8 (0-8)	5 (4,6)	5.1±1.8 (0-8)	5 (4,6)
		P=0.517					
Total score		26.92±5.8 (6-41)	27 (23,31)	26.6±5.6 (6-39)	27 (23,30)	27.5±5.9 (6-41)	28 (23,32)
		P=0.062					
		Total		Governmental school		Private school	
Variable		N	%	N	%	N	%
The total score of knowledge	Good	265	45.5	156	44.8	109	46.6
	Poor	317	54.5	192	55.2	125	53.4
The total score of school	Good	181	31.1	108	31.0	73	31.2
	Poor	401	68.9	240	69.0	161	68.8

health							
Total score	Good	261	44.8	165	47.4	96	41.0
	Poor	321	55.2	183	52.6	138	59.0

Data were presented as number (%), or as Mean ± SD, or as median (quartile)

There was a significant negative correlation between age and attitude score and total score, where older age teachers showed a more negative attitude and the less total score (r=-0.122, p-value-0.003) and (r=-0.104, p-value =0.012). Also, there was a significant negative correlation between years of service and both attitude score and total score, where teachers with more experience showed a more negative attitude and the less total score (r=-0.091, p-value-0.028) and (r=-0.083, p-value =0.045). There was a significant difference in knowledge score regarding educational level, having training, and hearing about first aid, where those with a bachelor degree, those who attend a training program, and those who heard about first aid had the higher knowledge score than others (p =0.037, p<0.0001, and p=0.014) respectively. There was a significant difference in attitude scores regarding school type and hearing about first aid. Those who heard about first aid had a higher attitude score than others (p=0.001), respectively. There was no significant difference in school health services score regarding the region, marital status, educational level, having training, and hearing about first aid, (p>0.05). There was a significant difference in total score regarding having training and hearing about first aid, where those who had training, and those who heard about first aid had the higher overall score than others (p<0.0001, and p=0.003) respectively, (Table 5).

Table 5 Relation between demographic data and knowledge, attitude, school health, and total scores:

Variable		Knowledge		Attitude		School health		Total score	
		Mean Rank	p-value	Mean Rank	p-value	Mean Rank	p-value	Mean Rank	p-value
Region $	center	282.59	0.172	269.96	0.080	285.68	.970	272.18	0.456
	west	287.72		315.34		291.61		298.66	
	north	262.53		310.65		285.62		281.30	
	east	298.27		268.37		292.52		286.40	
	south	318.68		286.64		299.57		310.75	
Educational level$	Diploma	222.59	.037*	313.71	.063	312.04	.495	268.34	.579
	Bachelor's	297.56		286.33		291.47		292.10	
	Masters	297.11		357.07		241.29		327.79	
	other	283.70		437.80		245.80		341.00	
Marital status$	Married	288.28	.609	288.45	.169	300.57	.189	289.93	.266
	Single	304.08		308.18		273.57		305.94	
	Divorced	275.52		272.90		303.90		269.32	
	Widowed	275.33		206.83		229.22		224.50	
Having training^	Yes	327.99	.000**	300.36	.281	303.68	.133	322.91	.000*
	No	265.53		285.20		282.83		269.14	
Heard about first aid^	Yes	300.04	.014*	303.23	.001**	286.63	.404	301.99	.003*
	No	261.30		252.17		299.63		255.71	

Comparison was done using Mann Weitney U test (^) or Kruskal Wallis test ($)
P value < 0.05 considered significant

4. DISCUSSION

Emergency circumstances can happen anytime and anywhere, during day and night, on the street, at home, and of course in the schools (Adib-Hajbaghery & Kamrava, 2019). Where; injuries and accidents are the leading causes of death in children worldwide (Li et al., 2012). School children are vulnerable to minor and major accidents ranging from simple cuts, muscle sprains, nose

bleeding, splinters, lacerations, and fractures (Makeen et al., 2019). Where their bodies are developing and they have not yet learned to be careful about themselves and various environmental dangers (Li et al., 2012). Since children spend most of their day in childcare centers or schools, pediatric emergencies (medical conditions or accidental physical injuries) are more likely to occur in those settings (Li et al., 2012).

Therefore, sufficient knowledge of an adequate level of practice and a positive attitude towards first aid in Kindergarten is fundamental to teachers to provide a safe environment for the children. On the other hand, poor knowledge of first aid delays seeking care and, finally, a higher risk of death. Raising awareness of kindergarten teachers to know how to do first aid would improve early detection of problems and reduces the delay of seeking care (Olympia et al., 2010; Li et al., 2012; Sönmez et al., 2014; Adib-Hajbaghery & Kamrava, 2019; Makeen et al., 2019).

The present study aimed to measure the level of knowledge, attitude, and school preparedness of first aid among kindergarten teachers in Makkah, Saudi Arabia. The results of this study showed that more than half (58.2%) of kindergarten teachers had poor knowledge regarding first aid, while the majority (> 90.0%) had a high positive attitude. Several studies have reported the low levels of kindergarten teachers' knowledge regarding first aid. Similar results found in other studies in Ethiopia study (56.03%) had inadequate knowledge. In comparison, 65.23% had a positive attitude (Anmut et al., 2019), in Saudi Arabia, more than half had moderate knowledge, while the majority have a positive attitude towards learning and providing (>80.0%) (Makeen et al., 2019). Also, in Iran, study (59.7%) reported having moderate knowledge (Adib-Hajbaghery & Kamrava, 2019), and in India study, 87% had average knowledge, and 13% had a poor level (Joseph et al., 2015). It is less than the Iraq study, where 95% had good knowledge, and 5% had poor knowledge (Hussein et al., 2016). While it is better than Baghdad's study where (77%) of kindergarten teachers had poor knowledge (Hannon Al-Robaiaay, 2013). Better than Ethiopia study (60.0%) had poor knowledge (Ganfure et al., 2018) and better than China study, where only (3.7%) had good knowledge (Li et al., 2012). This result showed that the low levels of kindergarten teachers' knowledge regarding first aid are a common problem and have been reported by several studies.

In the current study, the most common injuries were choking, nose bleeding, breathing difficulty, fainting, and bleeding. While in Ethiopia study, the most common cases were nose bleeding (44%), seizure/epilepsy (29.8%), and choking (35.5%), (Anmut et al., 2019). In Iran study, the most common emergencies were fainting and convulsion (15.8%), wounds (14.7%), and Insect bite (12.6%), (Adib-Hajbaghery & Kamrava, 2019). In India, the common conditions necessitating first aid run by teachers were wounds (36%), syncopal attack (23%); sprain and fractures (11% each); heatstroke (7%); bleeding, epistaxis, and seizures (3% each); stomach pain (2%); and burns, foreign body in eyes, and choking (1% each) (Joseph et al., 2015). In another Ethiopian study, the most common problems were nose bleeding (67.0%), choking (57.7%), epilepsy (55.5%), fainting (50.0%), and swallowed poisoning (44.3%), (Ganfure et al., 2018). This difference could be due to the variety of socio-economic factors, culture influence, and geographic areas.

The highest participants' correct responses first aid were related to the definition (93.4%), how to deal with back and neck injuries (82.6%), chocking child (78.2%), bleeding (73.5%), and breathing difficulty (73.5%). While the least correct knowledge about first aid was about how to deal with epileptic child (18.0%) and friend' bitten (26.5%), the reason for this result may be that epilepsy cases cause fear in the people who watch it, so they need time to deal with the surprise and then start the first aid. While nose bleeding, choking, felt down and injure back and neck are very common in children. In Ethiopia study, the correct knowledge was about nose bleeding (82.2%), nose bleeding (69.9%), fainting child and choking child (52.5% each) (Anmut et al., 2019), and in India's study, the correct knowledge was about burns (80.8%), and wounds (78.8%). While the less right knowledge was about Choking (4.1%), Syncopal attack (5.5%), and epistaxis (7.5%), (Joseph et al., 2015).

In Iran study, the correct knowledge was about the foreign body (86.7%), trauma (85.7%), and electricity shock (81.6%). While the less right knowledge was about fractures (6.6%), choking (16.8%), and fallen from a high place (1.6%), (Adib-Hajbaghery & Kamrava, 2019). In china's study, the most common correct knowledge was swelling cases (92.0%), bone injury (84.9%), burns (83.2%), and Electrical burns (82.2%). While the less correct knowledge was convulsive seizures cases (18.0%), chemical injury to the eye (23.9%) (Li et al., 2012). These differences in the percentage and the correct knowledge could be due to several factors such as socio-economic factors, previous training, and source of information, sample size, and studies nature.

Findings of the present study showed that participants' knowledge and attitude grades regarding first aid were significantly better among younger age, higher educated, shorter experience. Moreover, participants' knowledge grades regarding first were better among governmental schools' teachers, those who hear about first aid, and those who attend training programs, regarding age and experience factors. This result could be reasons to several factors; younger teachers are young with little experience, so they want to learn more and improve their careers. They had more energy and fewer responsibilities than older and more experienced teachers. They spent a lot of time on social media, so they have more chances to collect and exchange information. Lastly, in the last few years, universities and colleges add a first aid curriculum for teachers.

In the Jazan study, there was a significant difference in knowledge score regarding experience, where those with moderate experience years had a higher score (4.11) followed by long experience (3.66) and lastly little experience (3.81) (p value=0.011) (Makeen et al., 2019). In Iran's study, there was a significant difference in knowledge scores regarding previous training, where those who received training had better knowledge scores than those who didn't receive (11.0 vs. 9.16, p value <0.001)(Adib-Hajbaghery & Kamrava, 2019). In china study, knowledge level was significantly higher among teachers who had higher education levels ($t = 2.069$, $P = 0.039$), who were from rural districts ($t = -3.785$, $P < 0.001$), who had received first aid training before ($t = 2.506$, $P = 0.012$), those who were already healthcare providers ($t = 4.546$, $P < 0.001$), and younger personnel ($t = -4.185$, $P < 0.001$) (Li et al., 2012). In the Iraq study, a significant positive attitude was among those with longer experience (p-value =0.003) and those who lived in an urban area (p-value =0.03). While those with moderate monthly income had a significantly higher level of knowledge (p-value =0.025) (Hussein et al., 2016). Based on the current study, participants who received a health education training program (41.6%) or heard about first aid (26.3%) had a better level of knowledge than those who did not hear about it or didn't receive training. This result could be because women who receive training or hear about first aid are more capable of dealing with emergency cases and asking for help.

Several studies conducted to assess the effectiveness of training programs to improve knowledge and attitude levels (Li et al., 2012; Sönmez et al., 2014; Soliman Behairy & Al-Batanony, 2016; Ahmed et al., 2017; El magrabi et al., 2017). In Esparza's study, the authors reported that 73.6% attend training programs, where their mean knowledge scores were higher than those who didn't attend any training programs. However, the difference wasn't statistically significant, indicating that the quality of the programs is more important than attending programs (Sönmez et al., 2014). In contrast, another study from Turkey reported that training programs are significantly effective, where there was a significant difference between pre-test and post-test scores of the experimental group ($z = -4.215$, $p < 0.01$) (Karadag Arli and Yildirim, 2017). Similar results were reported in Qassim, Assiut, and Port Said studies, in the whole three studies there was a significant improvement in knowledge level and practice after attending the training programs ($P<0.001$) (Abdella et al., 2015; Soliman Behairy and Al-Batanony, 2016; Kuponiyi et al., 2016; El magrabi et al., 2017). In China's study, the authors reported a significant improvement in knowledge level regarding the short-term and long-term, where even though there was a reduction in the knowledge scores after 4, 9 months and four years, the knowledge retention was still unassuming and steady (Li et al., 2014). These findings revealed the importance of first aid training programs and the continuity of these programs, where teachers, who are always with children, need primary first aid education to run first aid in accident or injury situations. First aid practices are critical since simple interventions can likely prevent death or additional injuries.

The present study showed that the majority of the schools had first aid box and more than two-thirds had school health programs, while less than fourth had health workers in the sickbay. In Nigeria's study, the authors reported that almost all of the schools studied did not have the services of a doctor, with one out of every six of the schools had someone trained in first aid. About four schools had a sick bay/clinic while fewer had school ambulance or bus to transfer sick children to hospitals in emergencies (Kuponiyi et al., 2016). Another study from Nigeria showed that the first aid box was preserved with funds from the school proprietor's impress account in 37 (40.7%) schools, while three (3.3%) kept it from voluntary donations by teachers. None of the schools had ambulance services; sick children were transported to the nearest hospital in the school bus in most (89%) of the schools visited (Oyinlade et al., 2014). These results revealed that poor school health services are still prevalent in several countries, which requires more attention. As an essential part of primary health care, school health services need more emphasis on the overall development of children and the citizenry of a nation. Generally, the knowledge of teachers about school health services was poor. Active school health services facilitate early detection and diagnosis with quick intervention to prevent mortality and decrease morbidity (Kuponiyi et al., 2016).

In the current study, the positive attitude was significantly higher among private kindergarten teachers than governmental kindergarten teachers, while there was no significant difference between private and governmental kindergarten teachers regarding knowledge levels and school health services. While, in Nigeria study, there was a significant difference between private and governmental schools regarding school health services, where private schools were better in applying school health services by four times than governmental schools (Adib-Hajbaghery & Kamrava, 2019). These findings indicate the importance of first aid in Kindergarten, the necessity to improve teachers' knowledge level, and the quality and quantity of school health services.

5. CONCLUSION

The current study sheds light on the situation of first aid in Kindergarten. Even with the high positive attitude towards Kindergarten first aid, the knowledge level and school health services are still poor. The positive attitude was significantly higher among private kindergarten teachers than governmental kindergarten teachers. There was no significant difference between private

and governmental kindergarten teachers regarding knowledge levels and school health services. Kindergarten teachers with inadequate knowledge and attitude about first aid were older, longer experienced, less educator, governmental schools' teachers, and those who didn't attend any training program.

We recommended more health education messages about first aid to kindergarten teachers, particularly for those who are older, longer experienced, less educator, governmental schools' teachers, and those who didn't hear about first aid or didn't attend any training program. Encourage kindergarten teachers to receive training on basic first aid. Further research is recommended to determine the effectiveness of both health education and training programs on first aid.

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Author Contributions

All the four authors participated in the preparation of the manuscript. The first author (Dr. Reham) and the second author (Dr. Muhammad) participated in the concepts, designing of the study, definition of intellectual content, manuscript editing, and manuscript review. The first author (Dr. Reham), the third author (Dr. Yasmeen), and the fourth author (Dr. Bashaier) participated in Literature search, clinical studies, data acquisition, data analysis, and statistical analysis.

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Conflict of Interest

The authors declare no conflict of interest with the content of this manuscript.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study.

Ethical approval

The study was approved by the Medical Ethics Committee of Ministry of health, Makkah Almukarama, Saudi Arabia (IRB: 11-02-K-076-0419-112).

Data and materials availability

All data associated with this study are present in the paper.

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