

## ORIGINAL RESEARCH

# Developing disaster management and first aid guidelines for school teachers in Cairo Egypt

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## ABSTRACT

**Background:** Each year, schools all over the world suffer from disasters, ranging from small to large damaging disasters that affect children safety and health. Teachers play significant roles in child protection. Therefore, teachers' training is very important for effective school disaster management. **Aim:** This study aims at evaluating the effectiveness of educational guidelines on school teachers' knowledge and skills regarding disasters and first aid management of school children.

**Methods:** Quasi-experimental design utilized for conducting the study. Purposive sample of 59 school teachers from Mostafa Kamel preparatory school and Emad Ali Kamel primary school, Cairo Egypt was allocated. Data were collected through demographic data, school teachers' first aid and disaster management knowledge, observation checklist for first aid and disaster management.

**Results:** The study revealed that, regarding knowledge, 18.6% of teachers had satisfactory first aid knowledge pre intervention; meanwhile post intervention was 66.1%. For practice, 59.3% of them gained adequate first aid practice after implementation of program, while pre intervention only 10.2% of them had. Also 1.7% of them had satisfactory disaster management knowledge and practice pre intervention, meanwhile post intervention 61% of teachers got with statistical significant difference pre and post intervention. Positive correlation found ( $p > .000$ ) among demographic characteristics, school teachers' knowledge and practice of first aid and disaster management.

**Conclusions:** The study concluded that a disaster management and first-aid training program for school teachers improved their knowledge and practice. **Recommendation:** Implementation of this program is highly recommended for all school teachers to enhance their knowledge and practice regarding disaster and first aid management. Further research needed to assess the impact of such programs on school health safety and child health.

**Key Words:** Disaster management, First aid, School teachers, Educational guidelines

## 1. INTRODUCTION

Disasters have a significant concern both nationally and internationally pertaining to damages caused by them. Recently, the number of natural and human-made disasters has increased dramatically.<sup>[1]</sup>

According to UNDP 2008, no country that does not stand the threat of a disaster, though they may be threatened at

different levels.<sup>[2]</sup> Disaster is a serious disruption of the function of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceed the ability of the affected community or society to cope with using its own resources.<sup>[3]</sup>

Children have considered primarily as vulnerable group victims of disasters.<sup>[4]</sup> In addition, they are vulnerable to injuries

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and accidents. Usually, one comes across minor bruises but at times, children may face severe accidents resulting in fractures, bleeding, fainting or even drowning, and thus, first aid becomes as important as taking a child to a medical facility.<sup>[5]</sup> Children classified as vulnerable groups due to lack of understanding of the situation and lack of sufficient compatibility strategies during disasters. Since 20% of the victims of the disasters are children and the fact that crises threaten strategic interests, special attention has to pay to preparedness and reducing the disasters' devastating effects.<sup>[6]</sup>

"First aid is the provision of initial care for an illness or injury. It performed by a lay person to a sick or injured patient until definitive medical treatment accessed. Certain self-limited illnesses or minor injuries may not require further medical care past the first aid intervention. It generally consists of a series of simple and, in some cases, potential life-saving techniques that an individual can be trained to perform with minimal equipment."<sup>[7]</sup>

First aid training has the potential to reduce morbidity and mortality from common injuries and illnesses, which represent a significant public health burden. In addition, training courses must prepare individuals to provide appropriate and efficacious treatment for a wide range of conditions.<sup>[8]</sup>

School is an important institution for learning students' health. School health services commonly neglected due to lack of awareness and education about common health problems and first aid care.<sup>[9]</sup> The teachers have the responsibility to keep an eye on their students. They should make sure that they are comfortable and secured within the school building.<sup>[10]</sup>

Children spend most of the time in school under the direct supervision of teachers. They exposed to various types of epidemiological factors in the school, which influence their present and future state of health.<sup>[5]</sup> School teachers viewed, as being in a position to support students' emotional and behavioral needs during traumatic events.<sup>[11]</sup> Hence, first aid should wellknown by school teachers to meet the urgent needs of school children during minor injuries. The importance of first-aid measures is particularly evident when the victim is a child. Teacher is the key person in school who attends such type of victims and always in a position to save their lives. Healthy safe environment is very important to avoid these hazards beside qualified teachers who can detect any health problem and can give first aid for commonly occurring emergencies in schools.<sup>[5]</sup>

Provide Health education programs in schools is eligible to prevent health related problems, which participate in children and community's wellness.<sup>[12,13]</sup> First aid health education

programs in schools are essential. Performing first aid actions requires a person's active and responsible participation based on the ability of taking the right decisions. Health education in first aid supports such ability, providing knowledge and skills, and enhancing people's ability to take correct actions. The immediate response in a health emergency can limit undesirable outcomes or even save lives.<sup>[14]</sup>

Teacher training is significant for effective school disaster management. When considering school disaster management, it is clear that schoolteachers play significant roles. In 2014, Shiwaku pointed out teacher training as an important issue particularly in the protection of health and safety of school children. Researches on teacher training for school disaster management are not many. Nevertheless, researches with topics of teacher training for school disaster management contribute to safety in disaster-prone areas.<sup>[15]</sup>

### 1.1 Significance of the problem

Each year, schools all over the world suffer from disasters ranging from small to large damaging disasters that seriously affect the operation of the school.<sup>[16]</sup> Hence, the teacher-training programs for disaster prevention are necessary. The focal points of disaster prevention education should emphasize knowledge of disaster awareness, attitude toward disaster prevention, disaster preparedness, and proper emergency response.<sup>[17]</sup>

In Egypt, the annual incidence of unintentional injuries sustained by children aged eleven and under estimated as 19.6% of students in normal school life.<sup>[18]</sup> Health Insurance Agency in 2009 stated that during school hours approximately 13,000 injuries occurring in school playgrounds yearly in Egyptian schools.<sup>[19]</sup> In 2014, Torrents caused a great damage inside schools especially in South of Delta Governorates of Asuit, Aswan, Sohag and Kana. Disaster caused in closing schools for week and death of seven students inside their schools because of torrents in different accidents.<sup>[20]</sup> Egyptian Afack newspaper in 2014 reported that explosion in a preparatory school's laboratory caused 25 injured cases among students.<sup>[21]</sup>

Hegazy *et al.* (2014) stated that Egyptian schools had no proper disaster management plan and untrained disaster team in primary governmental schools.<sup>[22]</sup> This may be lead to doubled or tripled cases of victims and injuries among these vulnerable groups. Disaster plan is just a documented paper to accomplish the disaster file in the school. In Egypt, despite unsafe school environment, there are no preparations for school disasters, there is no training for students or their teachers and there is no disaster team.

## 1.2 Aim of the study

This study aims at evaluating the effectiveness of educational guidelines on schoolteachers' knowledge and skills regarding disaster and first aid management for school children. This aim achieved through the followings:

- Assessing knowledge and skills of disaster management among schoolteachers.
- Assessing knowledge and skills of first aid among school teachers.
- Evaluating the effectiveness of educational guidelines program on disaster and first aid management among school teachers.

## 1.3 Hypothesis

Two hypotheses were developed and tested at 0.05 level of significance.

**H0.1** There will be no significant difference between the pretest and posttest knowledge score of school teachers on disaster and first aid management.

**H0.2** There will be no significant difference between the pretest and posttest practice score of school teachers on disaster and first aid management.

## 2. SUBJECT AND METHODS

### 2.1 Research design

A quasi-experimental study with pre and post evaluation design utilized to accomplish this study.

### 2.2 Settings

The study was conducted at Mostafa Kamel preparatory school for boys 33 Nubar street, opposite Ministry of Interior, Cairo, Egypt and Emad Ali Kamel primary school 3 Abd el-Azim Corridor of Ramses street Abbaseya. The two schools follow the Western District Directorate of Education, Cairo Governorate, Egypt.

### 2.3 Study subjects

By applying non-probability purposive sampling technique, 59 school teachers were selected for the study, 38 were in Mostafa Kamel preparatory school and 21 were in Emad Ali kamel primary school.

The sample size was calculated by using the Epi Info v.6 software package published by CDC (Centers for Disease Control and Prevention, Atlanta, GA, USA). To find any progress in school teachers' knowledge or skill from an expected level of 30% or less before the implementation, to 60% or higher after the implementation, to achieve 80% power with a medium effect and an alpha of 0.05. A sample size was calculated and a required sample of 50 was

determined which was increased to 65 to compensate for the expected 5% dropout, whereas only 59 teachers completed the questionnaires and accept to participate in the study.

### 2.4 Inclusion criteria

School teachers working in the selected study settings, available during the period of the study, and willing to participate in the study were included.

### 2.5 Tools for data collection

Two different tools were used to collect data for this study. They were developed by researchers in Arabic language based on recent literatures. Tools tested for content validity by agreement of five experts in the fields of Community Health Nursing and Pediatrics to ascertain relevance and completeness.

**Tool I: Self-Administered Structured Questionnaire** It was developed by the researchers in Arabic language. It contains three parts:

A) Basic information and demographic characteristics of teachers such as age, sex, marital status, job nature, years of experience *etc.*

B) School teachers' first aid knowledge: It was developed by the researchers in Arabic language based on recent literature and it consists of 55 items to assess general information of first aid management for wound care, burns, fractures, epistaxis, fainting, and foreign bodies in the ear, nose, or eye. The score one given for each correct answer and zero for incorrect answer. The total knowledge considered satisfactory if the percent score reached 60% or more. Reliability test was done whereas Cronbach's Alpha equals 0.96.

C) School teachers' disaster management knowledge: This was developed by the researchers in Arabic language based on recent literature and it consists of 39 items to assess general information of disaster, disaster preparedness, disaster management, dealing with injured personnel, and impacts of disaster in schools. The score one was given for each correct answer and zero for incorrect answer. The total knowledge considered satisfactory if the percent score reached 60% or more. Reliability test was done whereas Cronbach's Alpha equal 0.78.

**Tool II:** It was developed and filled by the researchers. It contains two parts:

A) Observation check list for first aid management developed and filled by researchers to assess the skills of teachers in first aid management based on recent literature. It consists of 66 items to assess first aid of wound, burns, fractures, epistaxis, fainting, and foreign bodies in the ear, nose, or eye.

If the performance was correct the participant scores one, and if incorrect or not done the participant scores zero. A teacher's performance considered adequate if the total score of checklist was 60% or above. Reliability test was done whereas Cronbach's Alpha equals 0.83.

B) Observation checklist for disaster management developed and filled by researchers to assess the performance of teachers regarding disaster management based on recent literature. It consists of 35 items to assess disaster team management, communication skills during disaster, evacuation plan, schools' reactions to disasters, and dealing with injured personnel. If the performance was correct the participant scores one, and if incorrect or not done he or she scores zero. Teacher's performance considered adequate if the total score of checklist was 60% or more. Reliability test were done whereas Cronbach's Alpha equals 0.74.

## 2.6 Ethical consideration

Ethical approval from Ain Shams University ethics committee obtained, together with an approval from the Research Center of the Faculty of Nursing. Afterwards, an official permission from the Cairo Educational Directorate and administrators of the two selected schools to conduct the proposed study elicited. Meetings and discussions were held between the researchers and schools administrators to make them aware about the purpose of the study, as well as to get better cooperation during the implementation phase. It was important to have their full support, especially to find out some sort of motivation to stimulate school teachers to participate positively in the study. The aim of the research was explained to the participants. After clarifying the procedures of the study, a verbal consent from every school teacher to participate in the study was obtained. Participants were informed about their right to refuse participation and to withdraw at any time without giving reasons and with no consequences. Total confidentiality of any given information assured.

## 2.7 Pilot study

The pilot study commenced once ethical approval had obtained. A pilot study carried out by 10% of school personnel (4 school personnel) to test the clarity, applicability, objectivity and feasibility of the tools to conduct the study. No Changes or modifications were done. The school teachers who were included in the pilot study were included in the study.

## 2.8 Procedures of the study

This study conducted through four consecutive phases: assessment, planning, implementation and evaluation. Data collection was done pre and post guidelines implementation.

### *I-Assessment phase*

The researchers started with a pilot test, and then validated the tool through the opinions of experts in nursing. Then the data collected from teachers under the study to identify their knowledge and skills regarding first aid and disaster management at schools.

### *II-Planning phase*

Based on the assessment phase, the program content and media (in the form of the program booklet, posters, and visual materials as video clips and pictures) were prepared by the researchers for school teachers under the study based on their learning gaps and needs identified from the pre-intervention assessment.

### *III-Implementation phase*

Implementation of the program done with the school teachers after explanation of the purpose of the study and their acceptance of participation. Teachers were divided into 8 groups; each group included seven teachers to facilitate training program application. They attended the educational program for 12 sessions/month). The program took 3 sessions/week/one month. Every session took about 20-30 minutes followed by 15 minutes for discussion.

The collection of data and application of the program lasted over a period of six months, started from November 2014 and ended in April 2015. Data were collected in three days/week from 9 am to 12 md according the school visiting hours and the presence of the targeted school personnel.

Individual sessions, group discussions, demonstrations and re-demonstrations used as teaching methods. Audio-visual aids as video clips, role-plays and introduction of a booklet were used to facilitate the process of educational program to serve the purposes for which it designed.

All teachers and administrators provided with a booklet on first aid and disaster management practice as well as a copy of all teaching materials on a CD at the end of data collection.

The researchers' telephone numbers given to school personnel and telephone numbers of all participating teachers taken to ensure contact probabilities and to facilitate meeting them during follow up visits in each school in order to complete data collection during follow up period.

### *IV-Evaluation phase*

The evaluation phase emphasized on estimating the effect of the educational guideline on school teachers' knowledge and practice of first aid and disaster management. The post-tests conducted for studied teachers after two weeks of implementation phase.

## 2.9 Statistical design

The quantitative data were analyzed using Statistical Package for Social Sciences (SPSS) program version 16. Data were presented in tables and charts using actual numbers and percentages. Appropriate statistical methods were applied (percentage, chi-square ( $\chi^2$ ), correlation coefficient ( $r$ ),  $t$ -test. Regarding  $p$  value, it was considered that: non-significant (NS) if  $p > .05$ , Significant (S) if  $p < .05$ , Highly Significant (HS) if  $p < .01$ .

## 3. RESULTS

Regarding demographic characteristics, Table 1 shows that more than two-fifths (44.1%) of the school teachers aged 40 years and more, ( $44.37 \pm 7.83$ ) were mean and standard deviation of them. It shows that more than half of them (55.9%) were males, nearly three quarters (71.2%) were married, majority (93.2%) were teachers, nearly half (50.9%) had experience more than 20 years and more than two thirds (67.8%) were not trained on first aid. In addition, it shows that nearly two-thirds of them worked in school Mostafa Kamel preparatory school.

Regarding first aid knowledge of school teachers pre and post intervention, Table 2 shows that nearly two thirds (62.7%) had unsatisfactory knowledge related to first aid of epistaxis, nearly three quarters (76.3% and 79.7%) had unsatisfactory knowledge related to general information about first aid and first aid of burn respectively. In addition, it shows that most of them (84.7%, 91.5%, 84.7%, 91.5%, 86.4%) had unsatisfactory knowledge related to first aid of wounds, fractures, fainting, foreign bodies, bites and stings respectively. While after implementation, school teachers had satisfactory knowledge with high statistical significant difference pre and post intervention. Moreover, it shows that the means of total first aid knowledge pre and post intervention were  $17.40 \pm 15.35$  and  $39.40 \pm 11.61$  respectively ( $p > .000$ ).

Regarding difference in total first aid knowledge among schoolteachers in pre and post intervention, Figure 1 illustrates the improvement in their first aid knowledge after implementation of program. Whereas pre intervention schoolteacher is satisfactory knowledge were 18.6%, post intervention were 66.1%.

Regarding first aid practice of school teachers pre and post intervention, Table 3 illustrates that most of them (86.4%, 83.1%, 89.8% and 83.1%) had inadequate practice related to first aid of wounds, fractures, bites and fainting respectively. Nearly three quarters (78%) had inadequate practice related to first aid of epistaxis. In addition, it shows that the majority of them (94.9% and 91.5%) had inadequate practice related to first aid of foreign bodies and burns respectively.

Meanwhile after implementation school teachers acquired good first aid practice with statistical significant difference pre and post intervention. Moreover, it shows that the means of total first aid practice pre and post intervention were  $10.09 \pm 11.14$  and  $42.25 \pm 9.1$  respectively with highly statistical significant difference pre and post intervention ( $p > .000$ ).

Regarding difference in total first aid, practice among school teachers pre and post intervention, Figure 2 shows that 59.3% of them acquired adequate practice regarding first aid after implementation of program, but pre intervention it was only 10.2%.

**Table 1.** Number and percent distribution of schoolteachers according to their demographic characteristics

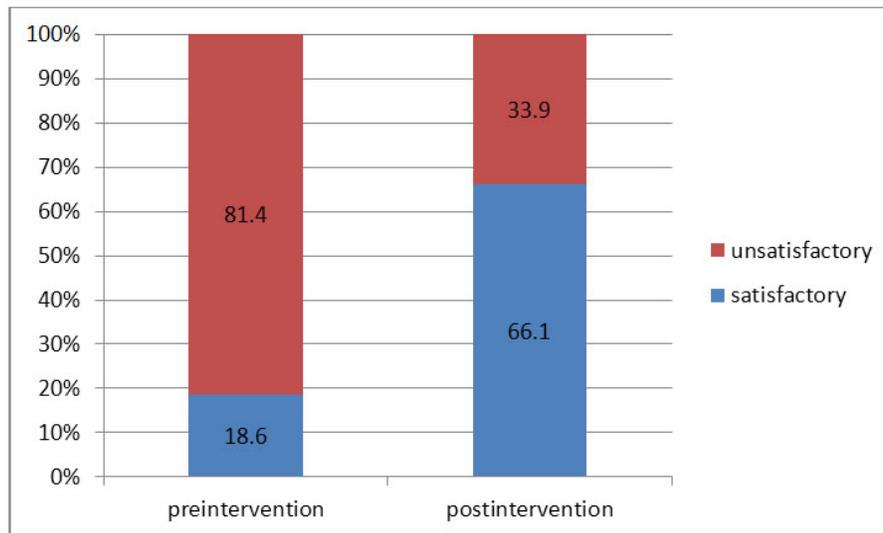
Parameter	N = 59	%
<b>Age</b>		
30-	18	30.5
40-	26	44.1
50-	15	25.4
Mean of age	$44.37 \pm 7.83$	
<b>Gender</b>		
Male	33	55.9
Female	26	44.1
<b>Marital status</b>		
Single	6	10.2
Married	42	71.2
Divorced and widow	11	18.7
<b>Job type</b>		
School manager	2	3.4
Vice-manager	2	3.4
Teacher	55	93.2
<b>Experience</b>		
> 10	13	22
10-	16	27.1
20-	30	50.9
Mean of Experience	$18.86 \pm 9.52$	
<b>Previous training</b>		
Yes	19	32.2
No	40	67.8
<b>School Name</b>		
Mostafa Kamel preparatory school	38	64.4
Emad Ali Kamel primary school	21	35.6

Regarding disaster knowledge of school teachers pre and post intervention, Table 4 demonstrates that nearly three quarters (74.6%, 79.7% and 79.7%) had unsatisfactory knowledge related to general information about disaster, disaster preparedness and dealing with injured personnel respectively. Also it shows that most of them (89.8%) had unsatisfactory knowledge related to impact of disaster in schools and all of them had unsatisfactory knowledge related to disaster management, while after implementation, school teachers

had satisfactory knowledge with highly statistical significant difference pre and post intervention. Moreover, it shows that the means of total disaster management knowledge pre and post intervention were (13.03 ± 4.75 and 23.03 ± 3.15) respectively ( $p > .000$ ).

**Table 2.** First aid knowledge difference for schoolteachers' pre and post-intervention phase

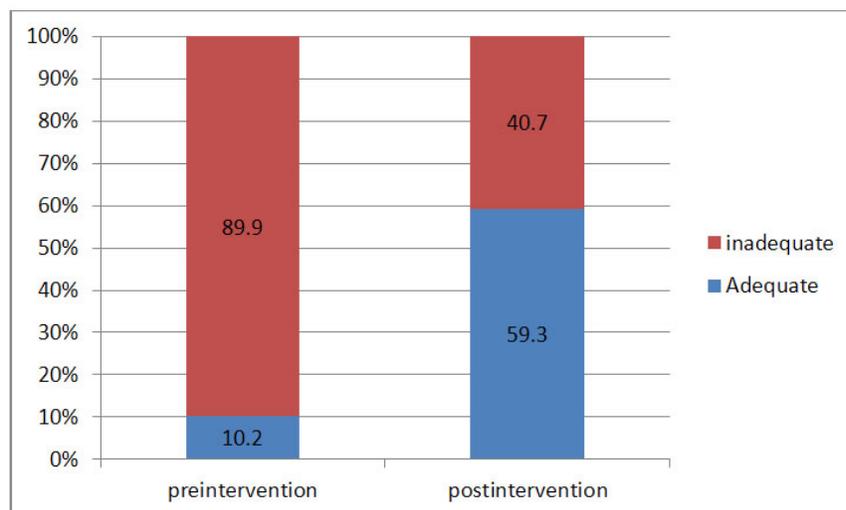
Item	Pre intervention (Total = 59)		Post intervention (Total = 59)		$\chi^2$	p-value
	No.	%	No.	%		
<b>General information about first aid</b>						
Satisfactory	14	23.7	44	74.6	30.51	.000
Unsatisfactory	45	76.3	15	25.4		
<b>First aid of wound and injury</b>						
Satisfactory	9	15.3	37	62.7	27.93	.000
Unsatisfactory	50	84.7	22	37.3		
<b>First aid of fractures</b>						
Satisfactory	5	8.5	36	61	35.92	.000
Unsatisfactory	54	91.5	23	39		
<b>First aid of epistaxis</b>						
Satisfactory	22	37.3	41	69.5	12.29	.001
Unsatisfactory	37	62.7	18	30.5		
<b>First aid of foreign bodies in ear, nose, and eye</b>						
Satisfactory	5	8.5	37	62.7	37.85	.000
Unsatisfactory	54	91.5	22	37.3		
<b>First aid of bites and stings</b>						
Satisfactory	8	13.6	38	64.4	33.98	.000
Unsatisfactory	51	86.4	21	35.6		
<b>First aid of Burn</b>						
Satisfactory	12	20.3	37	62.7	21.81	.000
Unsatisfactory	47	79.7	22	37.3		
<b>First aid of Fainting</b>						
Satisfactory	9	15.3	51	86.4	59.81	.000
Unsatisfactory	50	84.7	8	13.6		
<b>Score of total knowledge</b>	17.40 ± 15.35		39.40 ± 11.61		T test	.000
					-19.41	



**Figure 1.** Total knowledge of first aid of schoolteachers' pre and post intervention

**Table 3.** First aid practice difference for schoolteachers' pre and post-intervention phase

Item	Pre intervention (Total = 59)		Post intervention (Total = 59)		$\chi^2$	p-value
	No.	%	No.	%		
<b>First aid of wound and injury</b>						
Adequate	8	13.6	44	74.6	44.55	.000
Inadequate	51	86.4	15	25.4		
<b>First aid of fractures</b>						
Adequate	10	16.9	37	62.7	25.77	.000
Inadequate	49	83.1	22	37.3		
<b>First aid of epistaxis</b>						
Adequate	13	22	51	86.4	49.30	.000
Inadequate	46	78	8	13.6		
<b>First aid of foreign bodies in ear, nose, and eye</b>						
Adequate	3	5.1	35	59.3	39.74	.000
Inadequate	56	94.9	24	40.7		
<b>First aid of bites and stings</b>						
Adequate	6	10.2	37	62.7	35.16	.000
Inadequate	53	89.8	22	37.3		
<b>First aid of Burn</b>						
Adequate	5	8.5	35	59.3	34.03	.000
Inadequate	54	91.5	24	40.7		
<b>First aid of Fainting</b>						
Adequate	10	16.9	50	84.7	54.25	.000
Inadequate	49	83.1	9	15.3		
<b>Score of total practice</b>	10.09 ± 11.14		42.25 ± 9.1		t-test -34.66	.000

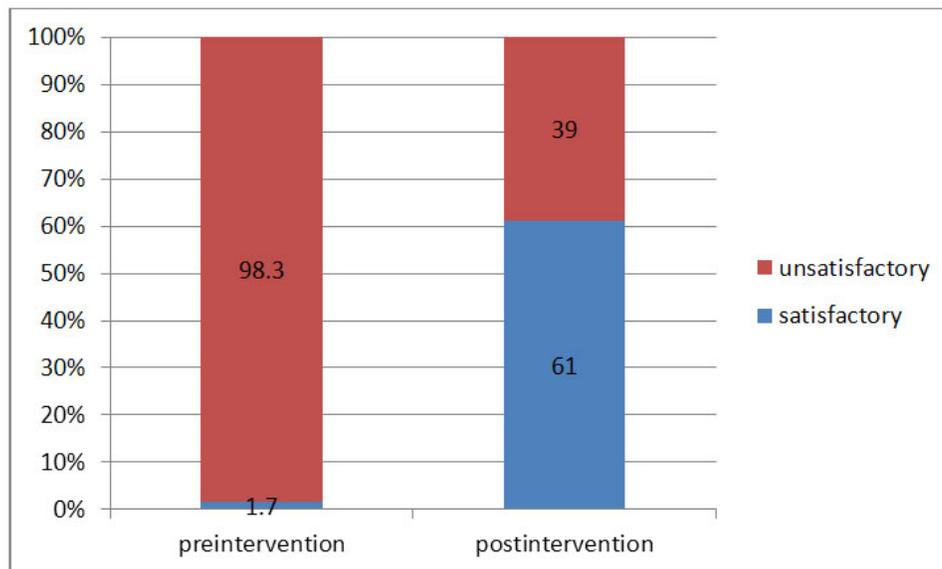


**Figure 2.** Total practice of first aid of schoolteachers in pre and post intervention

Regarding difference in total knowledge of disaster management among school teachers' pre and post intervention, Figure 3 illustrates improvement in their disaster management knowledge after implementation of program. Whereas pre intervention schoolteacher is satisfactory knowledge was 1.7%, post intervention was 61%.

**Table 4.** Disaster knowledge difference for schoolteachers’ pre and post–intervention phase

Item	Pre intervention (Total = 59)		Post intervention (Total = 59)		$\chi^2$	p-value
	No.	%	No.	%		
<b>General information about disaster</b>						
Satisfactory	15	25.4	34	57.6	12.59	.000
Unsatisfactory	45	74.6	25	42.4		
<b>Disaster preparedness</b>						
Satisfactory	12	20.3	36	61	20.22	.000
Unsatisfactory	47	79.7	23	39		
<b>Disaster Management</b>						
Satisfactory	0	0	38	64.4	56.05	.000
Unsatisfactory	59	100	21	35.6		
<b>Dealing with injured personnel</b>						
Satisfactory	12	20.3	39	66.1	25.17	.000
Unsatisfactory	47	79.9	20	33.9		
<b>Impacts of disaster in Schools</b>						
Satisfactory	6	10.2	48	81.4	60.22	.000
Unsatisfactory	53	89.8	11	18.6		
<b>Score of total knowledge</b>	13.03 ± 4.75		23.03 ± 3.15		t-test -21.05	.000



**Figure 3.** Total knowledge of disaster management of schoolteachers’ pre and post intervention

Regarding disaster management practice of school teachers’ pre and post intervention, Table 5 illustrates that only minority of them (3.4%) had adequate practice. Meanwhile after implementation nearly two-thirds (66.1%) of school teachers acquired adequate practice with highly statistical significant difference pre and post intervention. Moreover, it shows that the means of total disaster management practice pre and post intervention were (4.32 ± 4.13 and 19.93 ±

4.44) respectively with statistical significant difference pre and post intervention ( $p > .000$ ).

Regarding relation between socio demographic variable of school teachers and their knowledge and practice of first aid, Table 6 shows positive correlation ( $p > .000$ ) between age, previous training and experience of them and between their knowledge and practice of first aid. This means that the older, the more experienced and the more trained teachers were the

more knowledgeable and skillful they were regarding first aid. Additionally, it shows negative correlation ( $p > .000$ ) among school teachers regarding their gender, as females were more knowledgeable and skillful than males regarding first aid.

**Table 5.** Disaster management practice difference for schoolteachers’ pre and post–intervention phase

Item	Pre intervention (Total = 59)		Post intervention (Total = 59)		$\chi^2$	p-value
	No.	%	No.	%		
<b>Total practice</b>						
Adequate	2	3.4	39	66.1	51.16	.000
Inadequate	57	96.6	20	33.9		
<b>Score of total practice</b>	4.32 ± 4.13		19.93 ± 4.44			

**Table 6.** Correlation between socio demographic variable of schoolteachers regarding their knowledge and practice of first aid before intervention

Items	Total mean of knowledge		Total mean of practice	
	R	p value	R	p value
Mean of Age	0.494**	.000	0.559**	.000
Gender	-0.356**	.006	-0.444**	.000
Social status	-0.004	.978	0.009	.943
Mean of Experience	0.449**	.000	0.528**	.000
Job type	-0.301*	.021	-0.186	.157
School name	-0.223	.090	-0.133	.316
Previous training	0.771**	.000	0.787**	.000

\*\* Correlation is significant at the 0.01 level (2-tailed); \* Correlation is significant at the 0.05 level (2-tailed).

Regarding relation between socio demographic variable of school teachers and their knowledge and practice of disaster management, Table 7 shows positive correlation between age, previous training and experience of teachers and between their knowledge and practice of disaster management. This means that the older, the more experienced and the more trained teachers were the more knowledgeable and skillful they were regarding disaster management. Additionally, it shows negative correlation among schoolteachers regarding

their gender, as females were more knowledgeable and skillful than males regarding disaster management.

Regarding relation between knowledge and practice of first aid management and disaster management, Table 8 reveals positive correlation between knowledge of first aid, practice of first aid and between knowledge of disaster management which means that knowledge of disaster management correlates positively with practice of disaster management and knowledge and practice of first aid.

**Table 7.** Correlation between socio demographic variable of schoolteachers regarding their knowledge and practice of disaster management before intervention

Items	Total mean of disaster management knowledge		Total mean of disaster management practice	
	R	p value	R	p value
Mean of Age	0.485**	.000	0.259*	.048
Gender	-0.383**	.003	-0.278*	.033
Social	-0.037	.783	0.023	.862
Mean of Experience	0.450**	.000	0.275*	.035
Job type	-0.204	.122	-0.023	.866
School	-0.185	.160	0.002	.988
Previous training	0.687**	.000	0.273*	.036

\*\* Correlation is significant at the 0.01 level (2-tailed); \* Correlation is significant at the 0.05 level (2-tailed).

#### 4. DISCUSSION

Egypt has been, and continues to be, susceptible to a multiplicity of natural and man-made disasters. Moreover, urban disasters and severe accidents are also frequent in the country and quite often result in massive disaster situations.<sup>[23]</sup>

Teachers are the main caregivers and the first line of pro-

tection for school children. Their role complements that of parents. During school hours, school teachers are actually the first-respondents in cases of disasters or emergencies. They must be able to deal properly with health emergencies both in normal children, and in children with special health care needs.<sup>[24]</sup>

**Table 8.** Correlation between knowledge and practice of schoolteachers regarding first aid and disaster management before intervention

Items		(1)	(2)	(3)	(4)
(1) Mean of Knowledge of first aid	<i>r</i>	1	0.847**	0.812**	0.202
	<i>p</i>		.000	.000	.124
(2) Mean of practice of first aid	<i>r</i>	0.847**	1	0.850**	0.397**
	<i>p</i>	.000		.000	.002
(3) Mean of Knowledge of disaster management	<i>r</i>	0.812**	0.850**	1	0.411**
	<i>p</i>	.000	.000		.001
(4) Mean of Knowledge of disaster management	<i>r</i>	0.202	0.397**	.411**	1
	<i>p</i>	.124	.002	.001	

\*\* Correlation is significant at the 0.01 level (2-tailed).

The primary aim of this study was to determine the effectiveness of educational guidelines on school teachers' knowledge and skills regarding disaster and first aids management of school children.

Concerning personal characteristics, it was found that more than two thirds were not trained on first aid. Abernethy *et al.* in 2003 in USA reported that few schools had performed first-aid training for their teachers, whereas in many other schools none of staff members had updated the first aid training.<sup>[25]</sup>

In addition, Younis and El-Abassy in 2015 conducted a study on primary teachers' first aid management of children's school day accidents stated that the highest percentage of the schoolteachers did not attend any training courses.<sup>[26]</sup> Therefore, it is very important to conduct education programs for keeping the schoolteachers informed and trained. In addition trained health professionals must carry out these programs at regular intervals. All schoolteachers must learn basic first aid training during a disaster.

The present study declared that the highest percentage of school teachers had incorrect knowledge of first aid management. Most of them had unsatisfactory knowledge related to first aid. Meanwhile, after implementation school teachers acquire satisfactory knowledge with high statistical significant difference pre and post intervention. These findings may be explained by lack of training programs on first aid management and emphasize the importance of providing training on first aid for school teachers.

Most of the time first aid given by lay people such as teachers hence, their knowledge of emergency management of injured students is critical for lives saving especially during disaster. Unfortunately, many studies have reported lack of knowledge of schoolteachers regarding first aid.

In the same line, findings were proved by Ali *et al.* in 2010 who declared that educational training program on first aid for newly graduated nursery school teachers at Zagazig city had improved the knowledge and skills of nursery school teachers in first aid and dealing with wounds, fainting, burns, epistaxis, epileptic fits, and fractures. This improvement proved statistically.<sup>[27]</sup>

Also Baser *et al.* in 2007 conducted a study on Turkish teachers to evaluate the knowledge of first aid among primary school teachers. They stated that most of the teachers did not have knowledge about first aid.<sup>[28]</sup> Similarly, Li *et al.* in 2014 conducted a study on effects of pediatric first aid training on pre school teachers. Their results demonstrated that the training significantly improves knowledge levels toward first aid among respondents who attended the training course.<sup>[29]</sup>

Regarding first aid skills, the present study results revealed that many incorrect practices were prevalent among respondents and the most of them had inadequate performance related to first aid. Meanwhile after implementation school teachers acquired good first aid practices with statistical significant difference pre and post intervention. Unfortunately, life-threatening emergencies can occur in any school, at any

time. So teacher should be skillful in first aid measures to save lives by recognizing life-threatening emergencies during disaster and emergency situations.

These findings highlight the importance of the practical training component. Hence, it seems that there is an urgent requirement to strengthen school health services through involving teachers and educators, collaborating with them, and providing them with training programs.

In recent study conducted by Al-Samghan, *et al.* in 2015 to measure primary school teachers' knowledge about first-aid, they reported that nearly one quarter of primary school teachers in Abha, KSA had previous training in first aid and less than two thirds of them stated that these training included practical exercise.<sup>[24]</sup> This reflects deficient interest among teachers toward the importance of receiving training on first aid. The findings highlight the lack of the practical training component in more than one third of the attended courses.

Additionally, Abdella, *et al.* in 2015 conducted a study to evaluate an intervention program for the kindergarten teachers about pediatric first aids through which it was noted that before the program; almost all teachers had unsatisfactory skills. In comparison, more than half of them had satisfactory skills immediately post and during following up of the program intervention with statistical significance difference.<sup>[30]</sup>

Regarding disaster management, the present study demonstrated that high percentage of teachers had poor knowledge related to disaster management, impact of disaster, general information about disaster, disaster preparedness and dealing with injured personnel. There was a high significant improvement in post intervention, which proved by enhancing the means of total disaster management knowledge post intervention ( $p > .000$ ).

These findings were in accordance with Ramya' study, which conducted in 2006 to assess the effectiveness of a structured teaching program on knowledge regarding rural disaster management among school teachers.<sup>[31]</sup> It reported that the majority of teachers had poor knowledge on disaster management. Meanwhile their knowledge was improved after teaching program regarding rural disaster management.

In the same line, Mhaske in 2012 found that a planned teaching program on knowledge regarding disaster management among secondary school teachers was very effective in increasing the knowledge of teachers on disaster management.<sup>[32]</sup>

Again, Suresh in 2010 conducted a study to determine the effectiveness of a structured teaching program on knowledge and practices of disaster management among school

teachers. She revealed that there was gross inadequacy of knowledge on disaster management among school teachers. The teaching program succeeded in achieving significant improvements among school teachers' knowledge and management skills regarding disaster management with highly significant difference in knowledge and practice of school teachers before and after teaching program.<sup>[33]</sup>

In addition, Ganpatraoin 2014 reported that there is inadequate knowledge among school teachers regarding disaster management. He emphasized that teachers must be aware of disaster management in schools, gain knowledge and implement safety practices in school environment.<sup>[34]</sup> It is noticeable that disaster has significant impact on school children and the facts that confirm safety of them are basic rights of children. Accordingly, there is an urgent need for training program to enhance knowledge and practices of teachers, which help them to manage if an emergency arises.

Regarding disaster management practice of schoolteachers' pre and post intervention, the findings illustrated that the majority of them had inadequate practice. Meanwhile after implementation nearly two thirds of school teachers acquired adequate practice with statistical significant difference pre and post intervention ( $p > .000$ ).

It was evident that knowledge and practice of school teachers were less than adequate for helping children who are hurt in accidents occurring in schools and for minimizing the impact of the disaster on the school community. Hence, it is mandatory to conduct this training program for all the teachers to improve their management in disaster and emergency situations successfully.

Similarly, a recent study on effectiveness of training manual on disaster management among secondary school teachers at Pune city, Joshi *et al.* in 2015 reported the effectiveness of training in improving the performance of the schoolteachers. Whereas pre self-express of practice score was 7.05 and posttest self-expressed practice score was 11.93 showing increase by 69.92%, which proved statistically.<sup>[35]</sup>

In accordance to Hegazy *et al.* who conducted a study in 2015 on impact of a disaster educational program on knowledge and practices of primary school teachers in Cairo, they found that the majority of teachers were unskillful concerning disaster management before the educational program. Meanwhile the majority of them were skillful enough after the educational program implementation, which proved statistically.<sup>[22]</sup>

Riad *et al.* in 2013 concluded that there are significant deficiencies among majority of schoolteachers regarding disaster management and first aid management. Moreover, there was

a significant improvement after the program implementation of the knowledge and skills of school teachers regarding first aid, dealing with crisis management and evacuation of students during fire, which proved statistically.<sup>[36]</sup>

Our findings found positive correlation ( $p > .000$ ) between age, previous training and experience of school teachers and between their knowledge and practice of first aid and disaster management. In addition, it revealed that females were more knowledgeable and skillful than males regarding first aid and disaster management. In addition, the study confirmed positive correlation between knowledge of first aid, practice of first aid and between knowledge of disaster management. Meanwhile, knowledge of disaster management correlates positively with practice of disaster management and knowledge and practice of first aid.

In accordance, Riad *et al.* in 2013 revealed a positive correlation between age, knowledge, experience and practices regarding first aid and crisis management. As well, knowledge, and practices regarding first aid were positively correlated.<sup>[36]</sup> Hegazy *et al.* in 2014 revealed that a statistically significant negative correlation was found between teacher's sex and their total knowledge scores ( $p = .01$ ).<sup>[22]</sup>

Additionally, Ganpatrao in 2014 reported moderate correlation between knowledge and self-expressed practices of secondary school teachers regarding disaster management.<sup>[34]</sup> Abdella *et al.* in 2015 proved the association between the teachers' practices improvement and selected demographic variables as their age and years of experiences with posi-

tive correlation between teacher's knowledge and practice regarding first aid.<sup>[30]</sup>

In contrary, Mhaske's findings in 2012 revealed that there was no significant association of pre and posttest knowledge scores with demographic variables.<sup>[32]</sup>

## 5. CONCLUSION

The results illustrated a general lack of information and performance among school teachers regarding disaster and first aid management. However, the training program was effective in enhancing knowledge and practice of disaster and first aid management, which proved statistically. In addition, the study found positive correlation among demographic variables of school teachers' knowledge, practice of first aid and disaster management. In addition, it was found positive correlation among knowledge of first aid, practice of first aid and knowledge of disaster management.

## Recommendation

The study recommended a need for application of first aid and disaster management programs to all school teachers to enhance their knowledge and practice, to protect children and to implement safety practices in school environment.

Further researches needed to assess the impact of such programs on school health safety and child health.

## CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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