Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.5, No.29, 2014

Impact of a Disaster Educational Program on Knowledge and Practices of Teachers among Primary Governmental Schools, Cairo Governorate

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Abstract

Disaster is an extreme event that causes loss of life, property, essential services and means of livelihood. **Aim of this study;** was to assess the impact of a disaster educational program on knowledge and practices of teachers. **Research design;** A (pre-post) quasi-experimental design was adopted in this research. **Setting;** the study was conducted at three primary governmental schools in Cairo governorate. Three educational departments were assigned randomly from total thirty two departments. One school from each educational department was selected randomly (3 schools). These schools were El-Sayida Sakina, Ahmed Lotfy El-Said and El-Kasr Elaini primary governmental schools. **The study sample;** consisted of 50 teachers were included from three selected school in the research. Teachers number was; 17 teachers in El-Sayida Sakina School, 18 teachers in Ahmed Lotfy El-Said school and 15 in El-Kasr Elaini. **Tools for data collection**; three tools were used in this study; 1) Demographic characteristics for teachers; 2) Pre/ post knowledge questionnaire sheet. 3) Pre/post observational checklist. **Study results;** results revealed that, 70 % of teachers were females, 54% aged from 35-55 years. Nearly all teachers (94%) didn't have any experience in disaster management before the educational program compared to less than half (42%) of the teachers who had unsatisfactory knowledge about disaster management. While 96%, 100% respectively had good knowledge scores about disaster management immediately and 2 months after the educational program. Regarding to teacher's practices, 100% and 84% had good practice scores immediately and 2 months after the educational program respectively while 90% had unsatisfactory practice scores about disaster management before the educational program. A highly statistically significance differences were found between all practice subscales about dealing with injured personnel in disaster among teachers before, immediately and 2 months after the educational program. **The study concluded that,** educational program implicated changes in teaches' knowledge, and practices regarding disaster management in primary governmental schools. The study recommended periodic training programs for teachers in primary governmental schools

Key words: Teachers, disaster management, primary governmental school.

1-Introduction:

School is the work place of children; it is the place for them to experience success, accomplishment and an increasing sense of competence. Illness imposes limits on children's physical and cognitive abilities. Next to the family, schools are the major institution for providing instructions especially healthy instructions and experiences that prepare youth for their roles as adult and they are organized to prepare students for demanding workplace of the future. School is an integral part of total community. The school system has a specific responsibility in health care and planning to provide a healthy and safe school environment even in case of emergency (Smeltzer & Bare, 2010). A disaster can be defined as any tragic event stemming from events such as earthquakes, floods, catastrophic accidents, fires, or explosions. It is a phenomenon that can cause damage to life and property and destroy the economic, social and cultural life of people (Uscher-Pines, 2014). A disaster has been defined by American Red Cross, (2012) as "an occurrence, either natural or man- made, that causes human suffering and creates human needs that victims cannot alleviate without assistances. Disasters vary with respect to a number of characteristic, including their frequency, predictability, preventability, imminence, and duration.

Disasters also vary in terms of the extent of their effects. Individuals react to the same disaster in different ways, depending on their age, cultural background, health status, social support structure, and general ability to adapt to disasters. Common reactions of adults to disasters are the following; extreme sense of urgency, panic, fear, disbelief, disorientation, numbing, reluctance to abandon property, difficulty in making decisions, need to help others, scapegoating, delaying reactions; insomnia, headaches, apathy, depression, guilty feeling, moodiness, irritability, jealousy, resentment, domestic violence (Deborah, Brenda, Phillips, William & Fothergill, 2013). Disturbance in bodily functions, such as gastrointestinal upsets, diarrhea, and nausea and vomiting, are also common. People become anger and being to blame others as they realize how much they have lost and as they suffer physical fatigue, emotional stress, and a continuing change in personal comfort. Later, victims have difficulty sleeping, feelings of frustration, feelings of being overwhelmed, and powerlessness over their future, and guilt over not being able to prevent the disaster or do more to help resolve it (Kapoor, 2014).

The effects of disasters on children can be disruptive. Children may have heightened sensitivity to sights, sounds, or smells and may experience exaggerated responses to usual activities. In addition, they may have nightmares and fantasies that the disaster never occurred. Children may be suffering from regressive behaviors; bedwetting, thumb sucking, crying and clinging to parents. School-related problems may also develop, including an inability to concentrate or even refusal to go back to school. Older adults' reactions to disaster depend a great deal on their physical health, chronic illnesses, or functional limitations. They react deeply to the loss of personal possessions because of the high sentimental value attached to the items and the (Stanhope & Lancaster, 2010).

Applying proper disaster management plan in school is a great challenges that relate to size, physical and intellectual maturation and needs specific to school age children. This age learns how to cooperate with others, to play fairly and to confirm the social norms so that his life with others will be a positive experience for them. These characteristics require safe, secure and healthy physical school environment to avoid physical hazards and inhibition of psychosocial development of students (Jain, 2013). Teachers are the first contact with the school students. Good training of teachers is arranged under the issues of: 1) raising awareness within school communities; 2) building a culture of prevention; and 3) making school building safer (UNESCO, 2007). School health nurse is responsible for training of teachers, students and non academic personnel by her-self or qualified personnel. Comprehensive school health services should be developed to assist in meeting the needs of each child in the community especially in case of emergency. Intervention at primary, secondary and tertiary prevention levels are incorporated through collaboration with a diverse group of professionals' personnel and health care providers in the community (American Academy of Pediatrics [AAP], 2013).

2-Significance of the study:

In Egypt, primary students need more supervision, guidance and training especially in case of emergency through proper disaster management plan. The annual incidence of unintentional injuries sustained by children age eleven and under was 1400000 out of total 7142127 students in normal school life (Central Agency for Statistics and Mobilization, 2013). As well as, approximately 13,000 injuries occurring in school playgrounds during school hours yearly in Egyptian schools (Health Insurance Agency, 2009). In 1992, earthquake caused more than 530 deaths in Cairo, and more than 6,500 injuries. More than 5,500 residential, school and other buildings collapsed or were heavily damaged. Many of the casualties were not from falling buildings but from people being trampled in the panic to get out. In one district, 37 school children were killed and 65 injured in the panic to get out of school. In 2014, Torrents caused a great damage inside schools especially in South of Delta (Asuit, Aswan, Sohag and Kana) Governorates. Disaster caused in closing schools for week and death of 7 students inside their schools as a result of torrents in different accidents (Badary). Egyptian Afack, reported that 25 injured cases among preparatory students as result of explosion in school laboratory (2014).

From clinical observation and experience in Egyptian schools, there is no proper disaster management plan in primary governmental schools, the disaster plan includes assigned personnel (administrators' personnel & teachers), types of disasters that common in Egypt (fires, earthquakes & torrents), and detailed information about each disaster. This may be lead to doubled or tripled cases of victims and injures among these vulnerable group as well as the untrained disaster team. Disaster plan is just a documented paper to accomplish the disaster file in the school. In Egypt, there are no preparations for school in spite of the unsafe school environment. There is no training for the students or their teachers or the disaster team if any. Egyptian national information network (2014) reported that no studies were done in this area. So conducting the proposed study will provide school teachers with current knowledge pertaining to actual and potential hazards that may have negative impact on the school children health. So this study will aim to impact of a disaster educational program on knowledge and practice of teachers among primary governmental schools in Cairo Governorate.

3-Aim of the study:

The current study aimed at: assessing the impact of a disaster educational program on knowledge and practices of teachers among primary governmental schools in Cairo Governorate.

4-Research hypotheses:

To fulfill the aim of the study the following research hypotheses were formulated:

1-The post-test mean knowledge scores of teachers who are exposed to the disasters educational program will be higher than pre-test mean knowledge scores.

2-The post-test mean practice scores of teachers who are exposed to the disasters educational program will be higher than pre- test mean practice scores.

5-Subject and Methods

5-1-Research design:

A (pre-post) quasi-experimental design was used in this study.

5-2-Setting of the study:

The study was conducted at primary governmental schools in Cairo governorate. There were thirty two educational departments at Cairo governorate. Ten percent of these departments were selected randomly. Three educational departments were assigned randomly in the current study. These departments were EL-Kalifa & EL-Mokatam, Misr El-Kadima and El-Sayida Zainab. According to the policy issued in 2003 by the Ministry of Education that oblique governmental school to establish a disaster unit (Quality unit, 2013). The directors of primary Education in different departments picked the 3 schools that have empowered disaster team. One school from each educational department was selected using stratified random sample (3 schools). These schools were El-Sayida Sakina, Ahmed Lotfy El-Said and El-Kasr Elaini primary governmental schools.

5-3-Study Sample:

All teachers were included in the study from the three schools. 50 teachers were included from the selected schools in the study.50 teachers divided to 3 schools. El-Sayida Sakina was 17 teachers, Ahmed Lotfy El-Said was 18 teachers and El-Kasr Elaini was 15 teachers.

5-4-Inclusion criteria of schools:

Schools that have empowered disasters team.

5-5-Tools for data collection:

The following three tools were designed by the researcher to collect data pertinent to the study:

5-5-1 Demographic characteristics for teachers:

It consisted of age, sex, occupation, work years, years of experience in disasters and training programs.

5-5-2 Pre/ post knowledge questionnaire sheet:

This sheet included 4 parts: **1.** Knowledge about disaster team in school (5 questions), **2.** Knowledge about disaster management (12 questions), **3.** Knowledge about dealing with injured personnel (32 questions) and **4.** Knowledge about psychological stress (6 questions). This sheet involved knowledge about the disasters team, disasters concept; definition, causes, effect, aim of disasters plan and its components, aim and principles of health intervention after disasters, factors that affect rapid health intervention, possible injuries, dealing with injured personnel, concept of triage and its components, use signal card for injured personnel, treatment and transportation process, characteristics of emergency bag, needed equipments, cases who needed immediate intervention and psychological effects of disasters and its immediate intervention. **Scoring system:** the total number of the questions was 55. Each complete right answer was giving 2, incomplete right answer was giving 1, and wrong answer was giving zero (37 questions equal 74 scores). There were 18 questions having correct answer (Yes) was giving 1, and each wrong answer (No) was giving zero in its score (18 scores). Total scores for knowledge questionnaire tool were 92. Unsatisfactory level of knowledge was from 0-55 scores (< 60 %), satisfactory level of knowledge was from 56-69 scores (60- 75%), and good level of knowledge was from 70-92 scores (>75%).

5-5-3 Pre/post observational checklist:

Observational checklist consisted of seven subscales: **1.** Practice about wound care (5 questions), **2.** Practice about bleeding care (3 questions), **3.** Practice about dealing with unconscious personnel (5 questions), **4.** Practice about burn (2 questions), **5.** Practice about fracture care (2 questions), **6.** Practice about dealing with besieged person (3 questions), and **7.** Practice about the technique of lifting injured personnel (6 questions). This part involved the practices of disaster team regarding injured personnel in case of wound, bleeding, loss of conscious, resuscitation, burn, fracture and different ways to carry injured personnel. **Scoring system:** the total number of the questions was 26. Each complete right answer was giving 2, incomplete right answer was giving 1, and wrong answer was giving zero. Total scores for the second part of the observational checklist were 52. Poor practice level was 0-32 (< 60%), fair level of practice was 33-40 (60-75 %) and good level of practice was 41-54 (> 75%).

5-6-Procedure:

Data collection time period continued for 9 months starting at the beginning of September 2012 till May 2013. Data collection completed on one full academic year inside the schools. It was carried out on three phases; preparation phase, implementation phase and evaluation phase.

5-6-1-The assessment phase:

Official permission was taken from the Central Agency for Public Mobilization and Statistics followed by obtaining an official permission from the Cairo Educational Directorate to conduct the proposed study. Also, an official permission was obtained from the selected educational zones to permit the conduction of the study inside the selected schools. As well, official permissions were obtained from the directors of the selected schools. For construction of data collection tools, a review of the past, current Arabic and English related literature about various aspects of disasters as well as disasters management among schools in Egypt was done using available books, articles, periodicals and magazines to get acquainted with the research hypotheses and to develop the study tools.

In the preparation phase, program content was also prepared to be presented in Arabic and its content was built on the review of the related literature. This content was structured by the researcher based on the Egyptian plan for disasters in schools set by Ministry of Education, (2012) and the international disasters plan. A meeting was arranged with the managers of the disasters management unite in Ministry of Education, educational departments and different selected schools. Full explanation of the study was explained orally and in written form.

Videos about different types of disasters, evacuation inside schools, and first aid for different accidents were incorporated into theoretical content of sessions as well as the demonstration and re- demonstration of the clinical part of training. For demonstration; equipment such as cotton, Bethedine, gauze, dressing, splits, bandages were prepared. All English videos were translated into Arabic by the researcher.

5-6-2-The implementation phase:

An informal written consent was obtained from all teachers. The purpose and nature of the study was explained to participants to gain their cooperation and trust. After the needed modifications were done (from pilot study) in the different tools demographic characteristics and pre knowledge questionnaire were

distributed to the disasters team. Teachers 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. It was so difficult to collect all the teachers at the same session because of their classes and the supervision from the Ministry of Education for their performance inside classes. Most of the sessions were individualized according to the spare time of the disasters members except in summer and mid-term holidays. Maximum number of disasters' members was eight in the session.

The researcher started data collection by introducing herself to the teachers and explained the purpose of the study and the content. Full explanations of the rational of the study and its importance were done. Researcher began to collect structured interviewing data sheet and knowledge questionnaires. All interviews were conducted face to face to fulfill the structured interviewing data by the researcher. Structured interviewing sheet was taken 5-10 minutes for every participant. Each participant took 15-20 minutes to fulfill knowledge questionnaire after complete explanations of the questionnaire by the researcher. Knowledge questionnaires were completed by teachers themselves. Structured interviewing sheet and Knowledge questionnaire were fulfilled at the same session. While observational checklist was taken 20-30 minutes to fulfill after complete explanation. The completion of observational checklist was done by researcher through demonstration of practices by participant themselves or reporting of the participants regarding dealing with certain practice.

Individual sessions, group discussion, demonstration and re-demonstration were used as teaching methods. Audiovisual aids as videos, role play and booklet were used to facilitate the process of educational program. Then the designed educational program consisted of individualized sessions, interactive sessions, demonstration and video was directed to the disaster team. All subjects were provided with booklet on disaster knowledge, album of pictures for fist aid practice that needed in disaster situation and in different situation of emergency; injury, bleeding, burn, resuscitation and caring injured personnel. Every subject was also given a copy of teaching material on a CD containing example for evacuation process during disasters in school. As well as, every disaster leader, director and school nurse took copy of Arabic First Aid Hand Book to be as a guide in each school.

5-6-3-The evaluation phase:

Reassessment of knowledge & practice were done using the same questionnaire immediately post educational program, and 2 months after the program.

5-7-Ethical consideration

For the ethical considerations an approval was obtained from the faculty of nursing ethical committee and from the school directors. Also, each teacher in the Disasters' team was informed about the purpose and nature of the study. The researcher emphasized that participation in the study was entirely voluntary; anonymity and confidentiality were assured through coding the data. Written consent was taken from teachers who accepted to be included in the study.

5-8-Pilot study

Pilot study was conducted on 10% of the study sample to assess clarity of the tools. A pilot study was done on one school (El- Sheek Ali Yossif primary school), 6 teachers affiliated to El-Sayida Zainab educational department. It was conducted to identify the potential problems that may arise during data collection and clarity of the questions and to examine tools applicability, clarify reliability, and feasibility. Subjects included in the pilot study were excluded from the study.

5-9-Statistical design

Upon completion of data collection, data were coded, scored, tabulated and analyzed using "statistical package for the social science" (SPSS program, last version 20). Numerical data were expressed as mean, standard deviation and range. Qualitative data were expressed as frequency and percentage. For qualitative data; comparison between two variables was done by using Chi-square test. Relations between different numerical variables were tested using Pearson correlation. Probability (p-value) less than 0.05 was considered significant and less than 0.001 was considered as highly significant.

6- Results:

Findings of this research will be presented in four main parts: 1) demographic data of the sample (teachers). 2) Knowledge of teachers 3) Practices of teachers regarding dealing with injured personnel in disaster 4) Correlation between variables under the study (knowledge and practices) and teachers' demographic data.

Part I: Description of the Sample:

Table (1): Percentage distribution of demographic data of teachers (n=50).

Teachers (n=50)	No.	%
Sex:		
Male	15	30.0
Female	35	70.0
Total	50	100.0
Age: (years)		
25-	10	20.0
35-	27	54.0
45-55	13	26.0
Total	50	100.0
Mean±SD	40.74±7.46	
Experience in disaster:		
Yes (5 years)	3	6.0
No	47	94.0
Total	50	100.0
Mean ±SD	16.92±9.05	

Table (1) reflects that more than two third (70 %) of teachers were females. While 54% of them aged from 35-55 years with a mean age 40.74±7.46. Majority (94%) of teachers in the selected schools didn't have any experience regarding number of years with a mean year 16.92±9.05.

Part II: knowledge of teachers regarding disaster:

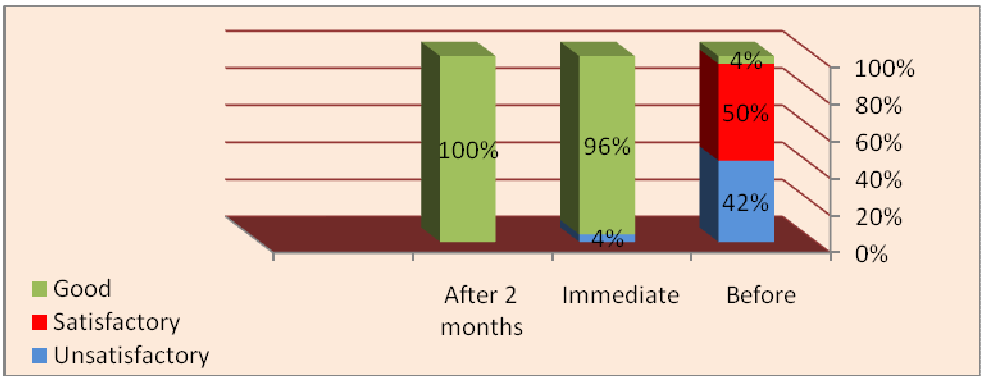

Figure (1): Percentage distribution of teacher's knowledge score (n=50).

Figure (1) indicates that, the majority (96%) of teachers and all of them (100%) had good knowledge scores immediately and 2 months after the educational program respectively. While 4 % of teachers had good knowledge scores before the educational program (hypothesis one).

Table (2): Knowledge scores about disaster among teachers before, immediately and 2 months after the educational program (n=50).

Knowledge subscales	Before	Immediate	2 months after	**F**	**P**
	Mean ±SD	**Mean ±SD**	**Mean ±SD**		
Team	3.46 ±1.02	5.70±0.46	5.7±0.46	126.18	0.000*
Management	11.92±2.10	18.78±0.61	18.94±1.62	323.34	0.000*
Dealing with injured personnel	37.04±5.58	52.44±0.92	50.74±3.25	250.48	0.000*
Psychological stress during disaster	6.62±1.51	11.84±0.42	11.48±0.99	369.70	0.000*
Total knowledge scores	**60.02±8.58**	**90.70±1.30**	**88.86±4.69**	**457.00**	**0.000***

* Significant difference < 0.05

As observed from table (2) highly statistically significant differences were found between all knowledge' subscale scores of teachers about disaster before, immediately and 2 months after the educational program (p=0.000).

Part III: Practices of teachers regarding dealing with injured personnel in disaster:

Table (3): Percentage distribution of total practice scores among teachers before, immediately and 2 months after of the educational program (n=50).

Total practice scores	**Before**		**Immediate**		**2 months after**	
	NO.	%	NO.	%	NO.	%
Unsatisfactory	45	90.0	0	0.0	2	4.0
Satisfactory	4	8.0	0	0.0	6	12.0
Good	1	2.0	50	100.0	42	84.0
Total	50	100.0	50	100.0	50	100.0
X±SD	**22.62±7.87**		**50.52±2.27**		**46.24±6.46**	

Table (3) illustrates that 90% of teachers had unsatisfactory practice scores about disaster before the educational program. While 100% and 84% had good practice scores immediately and 2 months after the educational program respectively.

Table (4): Practice scores about disaster among the teachers before, immediately and 2 months after the educational program (n=50).

Practice subscales	Before	Immediate	2 months after	**F**	**P**
	Mean ±SD	**Mean ±SD**	**Mean ±SD**		
Wound care	4.50±1.47	9.74±0.66	8.74±2.12	162.64	0.000*
Bleeding	2.72±0.99	5.58±0.57	5.20±1.14	138.24	0.000*
Fainting	4.56±1.61	9.20±1.03	8.16±1.89	122.04	0.000*
Burn	2.22±0.76	3.66±0.51	3.32±0.84	54.30	0.000*
Fracture	1.64±0.82	3.7±0.64	3.32±0.89	95.07	0.000*
Besieged person	2.86±0.90	4.88±0.32	4.46±0.81	107.44	0.000*
Carrying of injured personnel	3.66±2.82	11.76±0.43	11.20±1.59	286.83	0.000*
Total practice scores	**22.62±7.87**	**50.52±2.27**	**46.24±6.46**	**310.79**	**0.000***

* Significant difference < 0.05

Table (4) indicates a highly statistically significance differences between all practice subscales scores regarding applying first aid procedures at any incident during disaster among teachers before, immediately and 2 months after the educational program (p=0.000).

Part IV: Correlation between variables under the study (knowledge and practices) and teachers' demographic data.

Table (5): Correlation between teachers' total knowledge and practice scores & their demographic data (n= 50).

Teachers demographic data	Total Knowledge scores		Total Practice Scores	
	r	**P**	**r**	**p**
Age	-0.02	0.87	-0.02	0.85
Sex	-0.33	0.01*	0.10	0.10
Work years	-0.14	0.32	-0.04	0.74
Experience years in disaster	0.21	0.14	0.14	0.30

* Correlation is significant at the level ≤ 0.01

Table (5) reveals a statistically significant negative correlation was found between teacher's sex and their total knowledge scores (p= 0.01). While no statistically significant correlation was found between teachers' demographic data and their total practice scores.

7-Discussion

7-1 Description of the Sample:

The current study revealed that, more than two thirds of the teachers were females. A statistically significant negative correlation was found between teacher's sex and their total knowledge scores (p= 0.01). This result may be related to the responsibility of females as primary caregivers in their families where females face many emergency situations with their kids and other family members while males are often not present in the house.

7-2 Knowledge of teachers regarding disaster:

The current study indicated that, four percent of teachers had good knowledge scores before the educational program while the majority of teachers and all of them had good knowledge scores immediately and 2 months after the educational program respectively. This results are well matched with Gagliardi, Neighbors, Spears, Byrd & Snarr (2012) who studied (334) teachers working in public schools in USA and found that most of them

had knowledge deficit about emergency care due to lack of effective and formal emergency care training in teacher preparation programs. Also the same results was found by Tuswadi & Hayashi (2014) who studied 191 teachers in 24 selected primary schools in Merapi volcano area in Java Island in Indonesia and found that, teachers had lack of knowledge and skills related to disaster prevention due to limited teacher trainings. The study recommended that the local government together with the schools should make efforts in improving the teachers' performance through appropriate teachers' professional development programs. This stands on the same line with the situation in Egypt where effective participation of the Ministry of Education in specifying certain hours per week related to disaster (courses, lessons, meeting of disaster team to revise the disaster plan, apply disaster plan) is needed.

7-3 Practices of teachers regarding dealing with injured personnel in disaster:

The current study illustrated that, the majority of teachers had unsatisfactory practice scores about disaster management before the educational program. While all and majority of them had good practice scores immediately and 2 months after the educational program respectively. This result was supported by Gagliardi et.al (2012) that studied 334 teachers in U.S.A. and found a deficit in training of teachers on emergency care. Lack of effective, formal emergency care training in teacher's preparation programs coupled with no continuing education requirement in a possible explanation of these results. On the same line, Al-jundi et al (2005) who studied 220 school teachers in northern Jordan found that less than half of teachers received first aid training only once in their teaching career, not necessarily as a part of school health training.

In addition, the study done by Ostad Taghizadah, Mowafi & Ardalan (2013) explored the gaps in both the policy and practice of fire safety after primary school fire accident in Iran, and revealed that regular training of school personnel in fire safety measures should be organized. In Egypt, absence in teachers' practice from the side of the Ministry of Education may be related to lack of financial resources and no qualified teachers in disaster management, in addition to lack of enough time for teachers inside schools for training.

8- Conclusion: The present study concluded that, the majority of teachers and all of them had good knowledge scores immediately and 2 months after the educational program respectively. While the minority of them had good knowledge scores before the educational program. A highly statistically significant differences were found between all knowledge' subscale scores of teachers about disaster before, immediately and 2 months after the educational program. The majority of teachers had unsatisfactory practice scores about disaster management before the educational program. All and majority of teachers had good practice scores immediately and 2 months after the educational program respectively. There are a highly statistically significance differences between all practice subscale scores regarding applying first aid procedures at any incident during disaster among teachers before, immediately and 2 months after the educational program. There are highly statistically significant differences between total knowledge scores and total practice scores among teachers before and immediately after the educational and 2 months after the educational program.

9. Recommendations: Based on the findings of the study, the following recommendations can be made:
(1) Emphasize the availability of well oriented teachers with disaster management in schools.
(2) Periodic training program for all the teachers in primary governmental schools.

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