

Evidence Based Program Regarding Life Saving Interventions in Two Orphanage Houses in Benha City

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Abstract

Childhood injuries are an increasing public health problem globally. Evidence-based programs are programs that have been strictly tested. First aid programs is a vital initial step for providing effective life-saving intervention helping to reduce injury and increase the survival rates among children . **The aim** of the current study was to evaluate evidence based program regarding some lifesaving interventions in two orphanage houses in Benha city. **Research design:** A quasi experimental design was utilized. **Setting:** The study was conducted in two orphanages houses in Benha City, one orphanages house for males and the other for females. **Sample:** A convenient sample of fifty children was selected. 34 males and 16 females from the above mentioned setting. **Tools:** Two tools were utilized **I):** A structured interview questionnaire to collect socio-demographic characteristics of orphanage children and ` knowledge about injures and first aid of orphanage children. **II):** Observational checklist to asses orphanage children' practices regarding to first aid for injures and environmental condition of orphanage houses for sanitary and safety measures. **Results:** 60% of the studied children aged from 12 to less than 18 years, 74% of them had previous injury. None of the studied children had good total knowledge pre-program compared to 80%post-program. 24% of the studied children had satisfactory practices pre-program compared to76% post-program. 56% of orphanages houses' environmental conditions were not fulfilled. Also, a positive correlation with highly statistical significance was found between orphanage children' total knowledge and total practices post program implementation. **Conclusion:** Evidence based program regarding some lifesaving interventions had a significant effect on improvement of orphanage children' knowledge and practices regarding first aid and injuries. **Recommendations:** Multi-location studies in the country to evaluate the levels of knowledge and practices about first aid measures amongst orphanages children. Periodically evidence based program regarding first aid should be introduced at orphanages houses in order to decrease the early mortality and morbidity of accidents and emergencies.

Keywords: Evidence Based Program, Lifesaving Interventions, Orphanage Houses.

Introduction

An orphan refers to a child who has missing one or both parents to any reason of death and under 18 years of age; this child is in need of care and protection. According to this definition, in 2015, there were nearly 140 million orphans globally, as Asia included 61 million, 7.3 million were in Eastern Europe and Central Asia, also the Caribbean and Latin America included 10 million, and 52 million were in Africa (UNICEF, 2020).

Orphanage houses continuing springing up to accomplish children's need. Whereas orphanages houses were habitually the finest option available to orphanage children with no place else to go, they occasionally lacked the essential staff, building structure and resources to sufficiently care for all needy children. As a consequence, some orphanages were overcrowded, and lived in poor unsafe environmental conditions. (American Adoptions, 2020)

Unintentional injuries are the biggest threat to the survival of children especially in school age. It also a most important cause of disabilities, which may have a continuing effect on children' lives aspects such as relations, education and activities. Childhood injuries are an increasing public health problem globally. Millions of children suffer of non-fatal injuries and hundreds of thousands of others die from yearly (WHO, 2018).

Evidence-based programs are strictly tested programs in controlled settings, recognized effective and converted into practical strategies that are broadly obtainable by community-based organizations. Significantly, the evaluations themselves have been exposed to critical peer review as experts in the field not only the individuals who developing and evaluating the program have studied the evaluation's approaches and agreed the program's special effects. Eventually, when conducting an evidence-based program, assertive program works that is greatly improve the constituents' health delivered. (Evidence-Based Leadership Collaborative, 2020).

Life-saving interventions are any behavioral and/or technological strategy aimed to minimize the chance of mortality rate in children. First aid is a life-saving intervention includes primary intervention for casualty with a serious condition prior to specialized medical assistance being available, such as carrying out CPR, as well as provision of wide-ranging treatment in other less serious conditions, such assisting child with choking or burns(International Federation of Red Cross and Red Crescent Societies, 2016). Appropriate life-saving interventions was associated with improved outcomes among children after injuries. (Mitraetzl, 2019)

First aid is the main care provided to a casualty of injury, an accident, or unexpected illness, prior

the delivery of advanced medical care. First aid aimed to reserve life, encourage recovery and avoid worsening of the casualty's condition. First aider should be capable to assess the victim, provide the elementary care, and then refer the patient to an appropriate medical care facility as soon as possible **(Guariguata and Jeyaseelan, 2019)**.

First aid is a primary steps vital for given effective and fast life-saving intervention that can helping reduce injury and suffering and increase the survival chances among children. Providing evidence-based first aid program to children, contributes to raising healthier and safer communities through preventing or reducing hazards in daily situations worldwide. **(International Federation of Red Cross and Red Crescent Societies, 2016)**.

First aid intervention considered one of the essential community survival skills for all personalities, as injuries and accidents have turn out to be widespread. Safety education must begin with school children since not only they represent the majority of the at-risk population vulnerable to injury, they also have the passion to learn among their peers and community members. **(Bandyopadhyay et al., 2017)**.

Education for first aid is broader than CPR training only. Early childhood first aid training will develop the awareness, skills and ability of an individual to implement first aid in an emergency situation.

Everyone should be learned and trained about life-saving interventions including first aid measures, even children.. Early training sets the basis for potential training opportunities **(Banfai et al., 2017)**.

Significance of the study:

The overall injuries' prevalence amongst high school students was 68.5% in Egypt and this high prevalence requires improving public awareness about the significance and burden of injuries **(Wahdan et al., 2016)**.

Around 830,000 children die from accidental injuries each year. In low income and middle-income countries, the bulk of these accidents happen. However, numerous preventive strategies occur. If they were joined into other child survival programs and applied on a larger scale, many of deaths and injury-linked disability can be prevented **(WHO, 2020)**.

Egypt has 1.7 million orphaned children. The number of children under age of 17 who are registered in orphanages is 23,779. This number is obviously understating the real number, because of the fact that numerous orphanages are not registered with the Ministry of Social Solidarity **(UNICEF and CAPMAS, 2017)**.

Life-saving role is an important role for parents in protecting children from injuries. While children in orphanages lost their parents and were

most of time without caregivers. So, orphanage children need to be prepared with knowledge about injuries and trained about first aid to protect themselves.

Aim of the study:

This study aimed to evaluate evidence based program regarding lifesaving interventions in two orphanage houses in Benha city through:

- Assessing the orphanage children' knowledge about first aid and injures
- Assessing the orphanage children' practices about first aid of injuries
- Designing and implementing evidence based program regarding some lifesaving interventions for orphanages children.
- Evaluating the effect of the evidence based program regarding some lifesaving interventions on orphanage children' knowledge and practices about first aid and injures

The hypothesis:

The evidence based program regarding lifesaving interventions will improve orphanage children' knowledge and practices about first aid and injures

Subject and Methods

Study Design: This study was carried out by utilizing a quasi-experimental design (pre/posttest).

Study Setting

This study was conducted at two orphanages houses in Benha City, one orphanages house for males and the other for females.

Sample:

A convenient sample of fifty children (34 males and 16 females) was selected from the previous mentioned sitting were included in this study that fulfills the following criteria:

- 1- At the school age (6- <18 years).
- 2- Hasn't any mental problem.

Tools:

Two tools were utilized:

Tool I: A structured interview questionnaire,

It was developed by the researchers, it consists of two parts:

Part 1:

It included socio-demographic Characteristics of orphanage children such as child's age, gender, educational level, first aid training courses, and history of previous injury.

Part 2:

A) It included orphanage children` knowledge about injures. This part included 13 questions which covered; meaning of injury, types of injuries, causes of injuries, risk factors of injuries, effect of injuries on children and community, type of wounds, types

of bleeding, signs of fractures, types of shock, signs of shock, degrees of burns, causes of poisoning and causes of choking.

- B)** Orphanage children' knowledge regarding to first aid for injures. This part included 8 questions which covered; meaning, purposes and principles of first aid, qualities of first aider, components of first aid kit, personal safety during provision of first aid, meaning of CPR, and conditions requiring CPR.

Knowledge scoring system:

A scoring system for orphanage children' knowledge was prepared as follows; each question had a set of answer points as each correct complete answer was scored 2, while 1 score for correct incomplete answer and didn't know answer was scored 0. The items' score was summed-up and divided the total by the items' number, providing a mean score for the part. The scores were converted into a percent score. Considered good total knowledge if the score is >75 % (>32), average total knowledge if it equals 50-75 % (21-32), and poor total knowledge if it < 50% (< 21) of the total knowledge.

Tool II: Observational checklist. It was developed by the researchers. It consisted of two parts to assess:

- A)** Orphanage children' practices regarding to first aid for injures. This part included (8 items),

cardiopulmonary resuscitation, first aid of fracture, first aid for wound and bleeding, first aid of shock, first aid of burn, first aid of choking, first aid of epistaxis, and first aid of poisoning.

Scoring system for practices:

The scoring system was calculated as follows; each question has 2 levels of answers: Done and not done and scored 1, 0 respectively. The total practices level was reflected satisfactory if the score $\geq 60\%$ (≥ 10) and unsatisfactory if it $< 60\%$ (< 10).

- B)** Environmental condition of orphanage houses for sanitary and safety measures. This part included 10 items covering site of institution, ventilation, lighting, safe sources of drinking water, sewage sanitation, kitchen safety, secure drugs cupboard, secure sources of electricity, secure sources of fire, and secure windows and children's rooms.

Scoring system for orphanage house environment:

Each item scored (2) if available and suitable, scored (1) if available and scored (zero) if not available. The total score of environmental assessment was considered highly fulfilled if the score was >75%, fulfilled if the score was from 50% - 75% and not fulfilled if <50%.

Validity and reliability of the tools:

The tools were reviewed by a panel of five expertise in community health nursing and pediatrics nursing who reviewed the tools' content for accuracy, clarity, comprehensiveness, relevance, applicability and easiness. Modifications were done according to their comments. Reliability of the tools was applied by the researchers for testing the internal consistency of the tool, after provision of the similar tools to the similar subjects under similar condition on one or more time. Answers from recurrent testing were compared (test- re- test reliability). Reliability for knowledge =0.87, and reliability for practice =0.82.

Ethical considerations:

The caregivers and the orphanage children were informed about the privacy of their information and it will be used for scientific research only, the study was voluntary, harmless, and anonymous and confidentiality of responses would be respected. Children had the full right to reject to participate in the study at any time. A formal consent was obtained.

Pilot study:

It was carried out on 10% (5) of the subjects in the studied group to test the clarity, feasibility, simplicity of the study tools and needed time for data collection. No modifications were done. The subjects of the pilot study were not included in the total

sample to assure the stability of the results.

Administrative approval

An official letter was submitted from the Faculty of Nursing - to the Director of the Social Solidarity Governorate, at Qalyubia to obtain the official permission to carry out the study.

Field Work:

In adding 2 weeks for pre-test, data was collected over 3 months from the beginning of March 2019 to the end of May 2019. The study was carried out by the researchers at the females and males orphanage houses for the studied sample. Data collection was conducted two days a week from 3:00 pm to 5:00 pm in the previously described study settings.

Evidence based program construction:

The current study was carried out according to four phases.

Assessment phase of the program: After thorough review of relevant literature, the program was developed by the researchers. It was updated and adjusted grounded on results gotten from pre-assessment tools. Children were individually interviewed by the researchers and the purpose of the study was explained.

2. Development phase of the program: On the base of the actual pre-program assessment results, the program was developed.

The program objective was to evaluate evidence based program regarding some lifesaving interventions in two orphanage houses in Benha city.

Contents of the program:

- A- Knowledge: three theoretical sessions containing knowledge about; meaning, purposes and principles of first aid, qualities of first aider and components of first aid kit, personal safety during provision of first aid, meaning of cardio pulmonary resuscitation (CPR) and conditions requiring CPR, meaning, types, causes and risk factors of injuries, effects of injuries on individual and community, types of wounds, types of bleeding and signs of fracture, types and signs of shock, causes of poisoning, degrees of burns, causes of choking. (Schimelpfenig et al., 2017), (Reveruzzi et al., 2016) and (WHO, 2018).
- B- Practices: three practical sessions containing training on the performance of; CPR and first aid of fracture, wound and bleeding, shock, burn, poisoning and choking (Canadian Red Cross, 2019) and (International Federation of Red Cross and Red Crescent Societies. (IFRC), 2016).

Methods for teaching:

Lectures, group discussion and International Federation of Red

Cross and Red Crescent Societies. (IFRC). role play as well as presentation are methods used to teach the content of the program.

Aids for teaching:

For the program submission, suitable teaching aids were explicitly prepared, which included: handout, lab top CD, as well as posters.

3. Implementation phase of the program:

Besides 2 weeks of pre-test, implementation of the program took 3 months from 1 March 2019 to 30 May 2019. The researchers are present at the previously mentioned study settings 2 days/week from 3:00 pm to 5:00 pm. The study was performed in the selected settings at the orphanage houses in Benha City by the researchers for the studied sample. The studied children were arranged in 8 groups, each group contained from 5-7 children and the researchers met 2 groups / day. This program provided in six sessions (3 sessions for theory, 3 sessions for practice). The length of every session extended from 45 to 60 minutes which includes discussion times according to children's accomplishment, advancement and feedback. Every session began with a rapid summary about the prior session and the new one objectives.

In order to improve learning, discussion, motivation and reinforcement were used during program sessions. A print of the program content was given as a gift

for every child to use it as a future reference, which considered form of direct reinforcement. All participants were cooperative with the researchers. Orphanage children took part in a discussion at the end of each session to correct any misunderstandings. They were also informed about the next session's time.

4. Evaluation phase of the program:

The evidence based program was evaluated directly after implementation phase using the post test tools which were the same format of pretest.

Statistical analysis

Before the computerized entry, the collected data was verified; statistical analysis was performed using version 20 of the Statistical Package for Social Science (SPSS). Using mean, standard deviation, number and percentage distribution, as well as Chi-Square and R test, the data was presented in tables.

Statistical significance was perceived as: Insignificant when P- value > 0.05, significant when P- value < 0.05, and highly significant when P-value < 0.001.

Results:

Table (1): Distribution of the studied children regarding to their socio-demographic Characteristics. It was clear that 60% of the children aged from 12 to less than 18 years old with mean age 8.86 ± 4.58 , while

68% of them were male and 40% were in primary education, 88% didn't receive previous first aid training courses and 74% had previous injury.

Table (2): Reveals that there was improvement in children' knowledge regarding to first aid post program implementation. No one of children had correct and complete knowledge preprogram about meaning, purposes, principles of first aid, qualities of first aider, components of first aid kit, personal safety during first aid, meaning of CPR, and Conditions requiring CPR compared by 74%, 74%, 76%, 96%, 86%, 92%, 82% and 84% post program respectively. Also, the table shows that there were highly statistically significant differences in all items related to children' knowledge about first aid pre and post program implementation.

Table (3): Describes that there was improvement in children' knowledge about injuries post program implementation. It was clear that pre-program implementation, no one of children had correct and complete knowledge about (meaning of injury, types of injuries, causes of injuries, risk factors of injuries, effect of injuries on individual and community, type of wounds, type of bleeding, signs of fractures, types of shock, signs of shock, degrees of burn, causes of poisoning, and causes of choking) compared by (88%, 84%, 84%, 88%, 88%, 90%, 78%, 86%, 72%, 72%, 70%, 58%, and 70%) post program respectively. In addition, the

table also reveals that there were highly statistically significant differences in all items related to children' knowledge about injuries pre and post program implementation.

Figure (1): Illustrates that, none of the children had good total knowledge preprogram, however post program increased to 80%, while 14% of them had average total knowledge pre program, however post program reached to 24% and 76% of them had poor total knowledge pre program but post program decreased to 6%.

Table (4): Indicates that there was improvement in children' practices post program implementation. It was clear that, preprogram 28% of children' practices were satisfactory regarding cardiopulmonary resuscitation and first aid of poisoning which increased post program to 84% and 78% respectively. While (40%, 30%, 34%,42%, 24% and 22%) of children' practices were satisfactory pre program regarding First aid of Fracture, First aid for Wound and Bleeding, First aid of shock, first aid

of burn, first aid of choking and first aid of epistaxis compared by (80%, 84%, 76%, 74%, 76% and 80%) post program respectively. Also this table illustrates that there were highly statistically significant differences in all items related to children' practices about first aid of injuries pre and post program implementation.

Figure (2): Shows that, 24% of the children had satisfactory practices pre-program, however post-program increased to 76% and 84% of them had unsatisfactory practices pre-program but post- program decreased to 16%.

Figure (3): Displays that; 56% of orphanage houses environmental condition were not fulfilled the sanitary and safety measures, and 12% were fulfilled, while 32% of environmental condition were highly fulfilled.

Table (5): Shows that there was a highly statistically significant positive correlation between children' total knowledge and total practices post program implementation, ($P<0.001$).

Table (1): Distribution of the studied children regarding to their socio-demographic Characteristics. (n= 50)

socio-demographic Characteristics	No.	%
Age in years		
6-<12	20	40.0
12-<18	30	60.0
Mean \pmSD	8.86 \pm 4.58	
Gender		
Male	34	68.0
Female	16	32.0
Educational level		
Primary	20	40.0
Preparatory	13	26.0
Secondary	17	34.0
First aid training courses		
Yes	6	12.0
No	44	88.0
Previous injury		
Yes	37	74.0
No	13	26.0

Table (2): Distribution of children' knowledge regarding to first aid pre and post program, (n= 50).

Children' knowledge about first aid	Pre program			Post program			X ²	p-value
	Correct and complete	Correct and incomplete	Don't know	Correct and complete	Correct and incomplete	Don't know		
	%	%	%	%	%	%		
Meaning	0.0	30.0	70.0	74.0	26.0	0.0	77.39	0.000**
Purposes	0.0	30.0	70.0	74.0	26.0	0.0	85.88	0.000**
Principles	0.0	26.0	74.0	76.0	24.0	0.0	75.04	0.000**
Qualities of first aider	0.0	26.0	74.0	96.0	4.0	0.0	93.06	0.000**
Components of first aid kit	0.0	26.0	74.0	86.0	14.0	0.0	81.80	0.000**
Personal safety during provision of first aid	0.0	32.0	68.0	92.0	8.0	0.0	87.20	0.000**
Meaning of CPR	0.0	42.0	58.0	82.0	18.0	0.0	74.80	0.000**
Conditions requiring CPR	0.0	36.0	64.0	84.0	16.0	0.0	77.84	0.000**

****Highly statistically significant difference P< 0.001**

Table (3): Distribution of children' knowledge regarding to injuries pre and post program, (n= 50).

Children' knowledge about injuries	Pre program			Post program			X ²	p-value
	Correct and complete	Correct and incomplete	Don't know	Correct and complete	Correct and incomplete	Don't know		
	%	%	%	%	%	%		
Meaning of injury	0.0	36.0	64.0	88.0	12.0	0.0	82.00	0.000**
Types of injuries	0.0	30.0	70.0	84.0	16.0	0.0	79.13	0.000**
Causes of injuries	0.0	34.0	66.0	84.0	16.0	0.0	78.24	0.000**
Risk factors of injuries	0.0	28.0	72.0	88.0	12.0	0.0	83.20	0.000**
Effect of injuries on individual and community	0.0	34.0	66.0	88.0	12.0	0.0	82.26	0.000**
Type of wounds	0.0	24.0	76.0	90.0	10.0	0.0	85.88	0.000**
Types of bleeding	0.0	26.0	74.0	78.0	22.0	0.0	76.16	0.000**
Signs of fractures	0.0	28.0	72.0	86.0	14.0	0.0	81.33	0.000**
Types of shock	0.0	24.0	76.0	72.0	18.0	0.0	74.15	0.000**
Signs of shock	0.0	22.0	78.0	72.0	18.0	0.0	75.36	0.000**
Degrees of burns	0.0	12.0	88.0	70.0	30.0	0.0	82.85	0.000**
Causes of poisoning	0.0	14.0	86.0	58.0	42.0	0.0	79.00	0.000**
Causes of choking	0.0	18.0	82.0	70.0	30.0	0.0	77.50	0.000**

****Highly statistically significant difference P< 0.001**

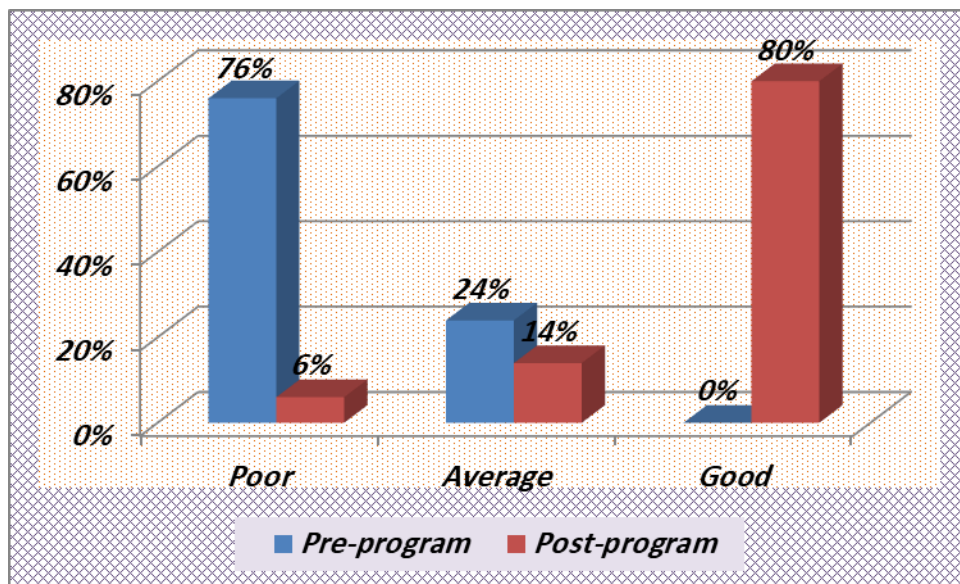


Figure (1): Distribution of children regarding to their total knowledge about first aid and injuries pre and post program, (n=50).

Table (4): Distribution of children' practices regarding to first aid of injuries pre and post program, (n=50).

Practices	Pre-program				Post-program				Chi square	P value
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory			
	No	%	No	%	No	%	No	%		
Cardiopulmonary Resuscitation	36	72.0%	14	28.0%	8	16.0%	42	84.0%	31.81	<0.001**
First aid of Fracture	30	60.0%	20	40.0%	10	20.0%	40	80.0%	16.66	<0.001**
First aid for Wound and Bleeding	35	70.0%	15	30.0%	8	16.0%	42	84.0%	29.74	<0.001**
First aid of shock	33	66.0%	17	34.0%	12	24.0%	38	76.0%	17.81	<0.001**
First aid of burn	29	58.0%	21	42.0%	13	26.0%	37	74.0%	10.50	<0.001**
First aid of choking	38	76.0%	12	24.0%	12	24.0%	38	76.0%	27.04	<0.001**
First aid of epistaxis	39	78.0%	11	22.0%	10	20.0%	40	80.0%	33.65	<0.001**
First aid of poisoning	36	72.0%	14	28.0%	11	22.0%	39	78.0%	25.09	<0.001**
Total practice	42	84.0%	8	16.0%	12	24.0%	38	76.0%	36.23	<0.001**

****Highly statistically significant difference P< 0.001**

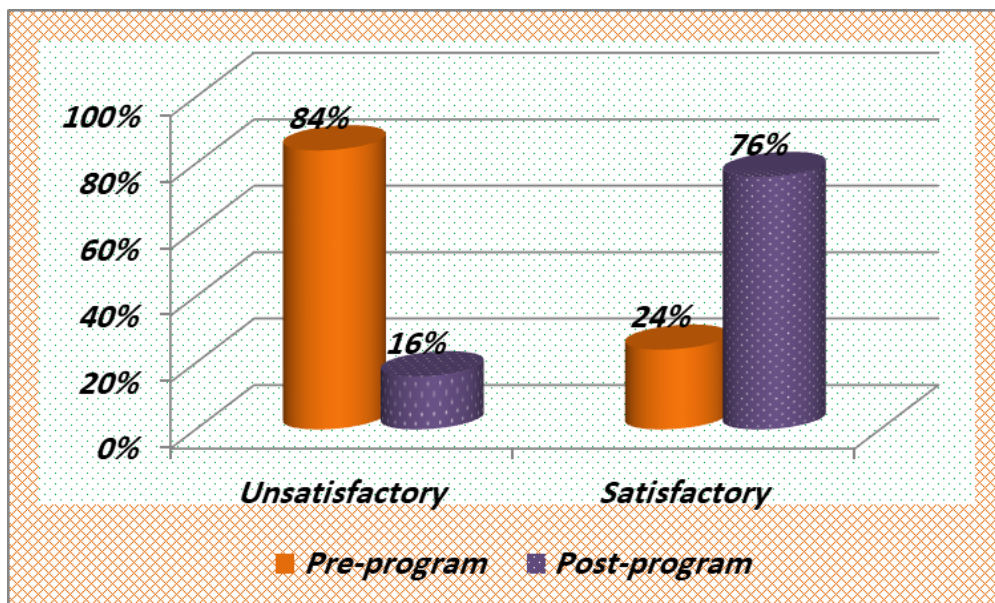


Figure (2): Distribution of children' total practices regarding to first aid of injuries pre and post program.

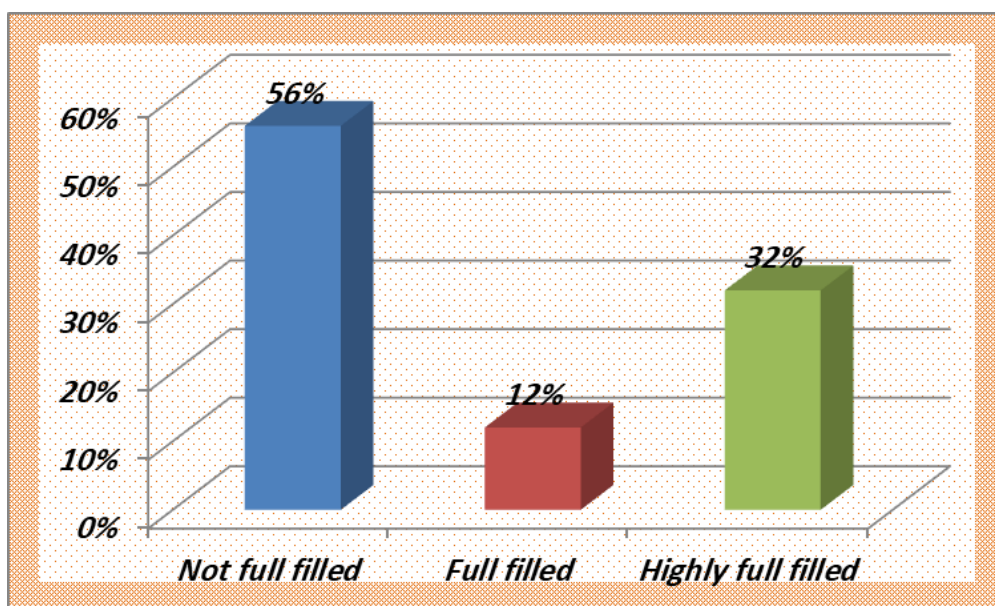


Figure (3): Distribution of children' orphanage houses according to environmental condition.

Table (5): Correlation between children' total knowledge and total practices regarding first aid of injuries pre and post program.

Variable	Practices			
	Pre-program		Post-program	
	R	P value	R	P value
Knowledge	0.014	>0.05	0.396	<0.001**

* Statistically significant difference $P < 0.05$

**Highly statistically significant difference $P < 0.001$

Discussion

Childhood Injuries producing various health problems globally. It can produce significant lifelong health problem or may lead to death. Evidence based program regarding first aid interventions provide information and skills to give secure awareness and practices to improve children safety (Muneeswari, 2014).

The aim of the current study was to evaluate evidence based program regarding some lifesaving interventions in two orphanage houses in Benha city.

Regarding socio-demographic characteristics of the studied children, the current study results showed that, less than two thirds of the studied children aged from 12 to less than 18 years with the mean age 8.86 ± 4.58 ; this is may be due to increase vulnerability of this age to more injuries, and injuries complications as a result of deficient knowledge. Around two thirds of children were male, less than half of them were in

primary education, the most of children didn't receive previous first aid training courses and about three quarter had previous injury (table 1). These results were consistent with **Das et al. (2020)**, who studied " A study on the effectiveness of educational intervention regarding first aid management of selected medical emergencies among adolescents at a school in Kolkata" reported that 75.1% of students were males and between ages of 14 to 19 years. Also these results are consistent with **Abdelhady et al. (2015)**, who studied " Effect of Training Program Regarding First Aid and Basic Life Support on the Management of Educational Risk injuries among Students in Industrial Secondary Schools" concluded that 40% of the students were in the age group 15- 16 years old and 75% of them had no previous first aid knowledge. Also this results in congruent with **Dasgupta et al. (2014)**, who conducted a study about" Effectiveness of Health Education in Terms of Knowledge Acquisition on

First- Aid Measures among School Students of a Rural Area of West Bengal" reported that 58.09% were 14 years of age and 95.2% of them had never trained on any kind of first aids.

Concerning first aid knowledge, the present study revealed that the majority of studied children had correct and complete knowledge post program about meaning of first aid, purposes, principles of first aid, qualities of first aider, components of first aid kit, personal safety during first aid, meaning of CPR, and Conditions requiring CPR. This study results clarified that there were highly statistical significant improvement in all items related to children knowledge about first aid post program implementation (table 2). This result is supported by **Abdelhady et al. (2015)**, who concluded significant improvement in the students' knowledge level regarding meaning, precautions and first aid bag from (44.4%) preprogram to (100%) post program. Also these findings supported by **Kapoor et al. (2017)**, who studied "Impact of training on knowledge and attitude regarding first aid among students of schools of Ahmedabad" and reported that 80% of the students had correct knowledge about aims of first aid, 83.66% of them had correct knowledge about CPR technique post program implementation.

Regarding knowledge of the studied children about injuries the present study revealed that the majority of children had correct and

complete knowledge post program about meaning of injury, types of injuries, causes of injuries, risk factors of injuries, effect of injuries on individual and community, type of wounds, type of bleeding, signs of fractures, types of shock, signs of shock, degrees of burn, causes of poisoning, and causes of choking (table 3). These findings congruent with **Mobarak et al. (2015)**, they conducted study on "First Aid Knowledge and Attitude of Secondary School Students in Saudi Arabia" and reported that 59.2%, 75.5%, 81.6% and 83.7% of trained students had correct knowledge about choking, heart attack, dealing with injured person and bleeding respectively. This finding is congruent with **Das et al. (2020)**, who stated that, knowledge of students regarding fainting, poisoning and convulsion, foreign body in the eye, electric shock, drowning and heat exposure increased significantly to 52.7 %, 65.75%, 56.7% 78.1%, 73.1%, 69.2%, and 69.2% respectively post-intervention.

Regarding the children total knowledge score pre and post program regarding first aid and injuries, our study illustrated that, around three quarters of them had poor knowledge before program compared to about the most had good knowledge about first aid and injuries after program (figure 1). This may be due to school-age children are more likely to receive and motivate toward first aid training, also they are acquire and do so quickly and easily than

older people. This result agreed with **Muneeswari (2014)**, who studied "Effectiveness of planned health teaching programme using child-to-child Approach on knowledge of selected first aid measures among school children in selected schools at Dharapuram in Tamil Nadu, India" and mentioned that the knowledge scores regarding first aid and injuries improved significantly among students following planned training program. Also These findings were in agreement with **Bandyopadhyay et al.(2017)**, who studied " Effectiveness of first aid training on school students in Singur Block of Hooghly District, West Bengal" and reported that there was significant difference between pre- and post-intervention knowledge at $p < 0.001$ level. Hence, it is interpreted that highly effective impact of the training program regarding first aid was effective in increasing the knowledge of students.

Regarding children' practices about first aid of injuries the present study revealed that post program the most of children' practices were satisfactory regarding cardiopulmonary resuscitation, first aid of poisoning, fracture, wound and bleeding, shock, burn, choking and epistaxis. Also, there were highly statistically significant differences in all items related to children' practices about first aid of injuries pre and post program (table 4). These results could be due to the appropriate researchers' motivation and increased interest of the studied children to get benefits from the training program to perform throughout

their life. The current finding was in accordance with **Abdelhady et al. (2015)**, who reported that there were highly statistically significant improvement in the mean score of first aid practice such as; fracture, burn, bleeding, fainting, poisoning, epilepsy, hypoglycemia and asthma, throughout the study at $p = 0.001$. The current study was inconsistent with **Joseph et al. (2014)**, who studied" Knowledge of First Aid Skills Among Students of a Medical College in Mangalore City of South India" and revealed that, 14.5% students only correctly practiced cardio pulmonary resuscitation (CPR) in drowning conditions.

Regarding children' total practices score towards first aid of injuries, The current study found that the most of them had unsatisfactory practice related to first aid of injuries before program compared to only quarter of them after the program. Also, fifth of children had satisfactory practices before the program compared with the most of them after program (figure 2). This may be due to the insufficient awareness about first aid that affects their practices negatively. Also the present study results support previous findings of **Kapoor et al. (2017)**, who reported that there were significant improvement in children ' practice scores regarding first aid and basic life support after the program implementation.

As regard the orphanage house environmental condition, The current study revealed that, more than half of orphanage house environmental

condition was not fulfilled the sanitary and safety measures (figure 3). This may be increasing house injuries among orphanage children and this may be attributed to insufficient knowledge about safety measures to prevent or minimize injuries. These findings supported with **Cheraghi et al. (2014)** who studied " Effect of educating mothers on injury prevention among children aged <5 years using the Health Belief Model" and concluded that, home is the primary place of childhood accidents and most of them are preventable through increased awareness and environmental safety at home. Also **WHO (2018)** stated that housing conditions affect the health status of occupants. Unintentional injuries at home contribute a significant burden of mortality and morbidity as well as to emergency department, mainly among children. While there are numerous factors, which contribute to housing injuries, structural problems in the home itself are an important issue. There is a need to comprehend the evidence base for several aspects of housing on health outcomes

Regarding correlation between children total knowledge and total practices, this study results clarified that there was a highly statistically significant positive correlation between children total knowledge and practices post program implementation (table 5). This may be attributed to knowledge improvement which in turn improves their practices. The present study results were in line with **Muhammad et al. (2017)**, who

studied " The effect of a structured first aid educational training course among secondary school students in Makkah city, Saudi Arabia" and reported that there were statistically significant positive correlation between total knowledge and practice through the study. Also, **Muneeswari (2014)** pointed out that there was statistically significant positive correlation between knowledge and practices of the students post planned health teaching program on first aid measures.

Conclusion

Evidence based program regarding some lifesaving interventions had a significant effect on improvement of orphanage children' knowledge and practices regarding first aid and injuries.

Recommendations

- 1- This study should be applied on a large sample at orphanage houses.
- 2- Periodically evidence based program regarding first aid should be introduced at orphanages houses in order to decrease the early mortality and morbidity of accidents and emergencies.
- 3- Mass media has a great responsibility for health awareness for accidents prevention among school age children.
- 4- Multi-location studies in the country to assess the levels of

knowledge, attitude, and practice about First Aid measures among orphanage children.

- 5- Further studies to assess the orphanages houses environmental conditions and its relation to injuries occurrence should be provided.

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