

Effect of Educational Program on Nurses ' Performance Regarding Children Safety Measures at Minia Hospitals

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Abstract

Background: children safety is an essential and vital component of healthcare quality. Strengthen the safety environment for child care with hazardous hospital environments is considered essential nursing role.

Aim: to evaluate the effect of educational program on nurses ' performance regarding children safety measures at Minia Hospitals.

Design: A Quasi-experimental research design was utilized in this study.

Setting: The study was conducted at pediatric medical departments & critical care unit in Minia University Hospital for obstetrics & pediatrics, General Hospital and Masr Elhora Hospital.

Sample: A convenient sample of 45 nurses was included in this study.

The tools of data collection: 1) Pre-designed questionnaire sheet to assess nurses knowledge regarding children safety in hospital, 2) safety attitude questionnaire to measure safety attitude. 3) Observation checklists sheet followed by designed educational and training program.

Results: There was positive correlation coefficient between nurses' total knowledge, attitude and practice scores in post-test. **Conclusion:** that, by the implementation of the program there was remarkable improvement of nurses' knowledge and practices; it was clear in post-test results.

Recommendations: Developing periodical training programs regarding children safety for the nurses working at pediatric departments to improve their knowledge, attitude and performance and to be aware of the significance of child safety in their work areas.

Key Words: Educational Program – Nurses performance - Children safety

Date of Submission: 04-11-2019

Date of acceptance: 20-11-2019

I. Introduction

Significant numbers of patients are harmed during receiving health care according to many studies which published in many countries. This harm in form of permanent injury, increased length of stay in health care facilities, or even death (Guinea, et al., 2018). The main priority for the health system to ensure patient safety and prevent malpractice while providing quality health care (Durgun and Kaya, 2018) children safety is a construct that implies behavior intended to minimize the risk of harm to children through both system effectiveness and individual performance designed to avoid injuries to children from the care that is provided to help them. (Donaghy, et al., 2018) Child safety is defined as the prevention of harm to child "focused on place on the system of care delivery that prevents errors. Child safety also defined as the prevention of harm: freedom from accidental or preventable injuries which result during providing medical care (Albrecht, 2015).

Improving child safety and quality of health care has been the first priority issue for health services around the world. It is considered that separating child safety from healthcare quality indicates a false dichotomy as child safety is a critical first step in providing quality care. Child safety is an important science, and there remain many unknowns, particularly concerning the burden of disease as a result of unsafe care. It is a young field within health care, both time, and stable funding is needed to develop and disseminate meaningful research and education (Kumar, 2016).

Pediatric patients were at high risk for medical errors and adverse events due to their unique factors and complexity of medical care. Due to the lack of awareness and knowledge among pediatric hospital administrators and direct health care providers, therefore minimal efforts were done to reduce and prevent medical errors among hospitalized pediatric patients so developing and implementing of effective patient safety practices will lead to successfully reducing and preventing the occurrences of medical errors and adverse events among hospitalized pediatric patients(Earley, 2015).

One of the necessary initiatives in improving deficits in patient safety is to recognize the important of Safety culture strategy. The definition and measurement of safety culture is continuing to develop as the demand for these culture assessments continues to grow rapidly. Employees In a safe culture are instructed by an organization- wide commitment to safety in which each member support their own safety norms as well as those of their co-workers(Berman et al., 2018).

Also description of children safety is the interactions between hospital culture, children safety culture, children safety climate and individual attitudes and behavior and relationships towards children safety. measure and improve children safety culture to improve children safety in hospitals is the current important focus of health care systems. Children safety culture contains the shared beliefs, attitudes, values, norms, and behavioral characteristics of health team (Singer and Vigus, 2018).

Joint Commission International and the WHO conjointly promoting national and international children safety goals for increasing awareness about these goals and ensure safe delivery of care. The international children safety goals include the following : Improve the accuracy of children identification, Improve the effectiveness of communication among caregivers, improve the safety of high alert medications, ensure correct site, correct procedure, correct child surgery, reduce the risk of health care associated infections, reduce the risk of child harm resulting from falls(The Joint Commission, 2019).

Minimizing fall risks and ensuring a safe environment free from hazards is the responsibility of all hospital staff. Nurses must be conscious and keep your-self up to date information and aware to any changes at the workplace environment by making risk management process to discover any dangerous which might affect children or workers health and safety(Jones, 2012). The nurse must take attention to electrical safety in hospital by covering electrical sources and must be out of children reach. All staff nurse should be trained to prevent firing and recognize potential fire hazards and know how to respond to an emergency individually and collectively by actions and communications. Nurse should follow standard precautions in infection control to prevent spreading infections among children which includes hand hygiene, use of personal protective equipment, sterile instruments and devices, safe injection practices and clean and disinfected environmental surfaces (AL-Rawajfah and Tubaishat, 2017).

1.2 Significant of the study

Medication errors (MEs) effect on pediatric safety and are more common in children than other populations. Also, pediatric have a much higher risk of injuries induced MEs than adults' patients as pediatric are vulnerable group to medication errors, due to: variations in weight, age, immature physiological adaptation systems, quick changes in the drugs' pharmacokinetic, poor knowledge about the correct toxic and therapeutic dosage in children(Rishoej, 2017).

According to Institute of Medicine [IOM], Medical errors caused by healthcare providers can result in unnecessary deaths of thousands of persons each year. A report by the IOM estimated that 44,000 to 98,000 patients die each year in United States hospitals because of medical errors. More people die from medical mistakes each year than from highway accidents, breast cancer, or AIDS(Rose, et al., 2014).

1.3. Aim of the Study

The aim of this study was to evaluate the effect of educational program on nurses ' performance regarding children safety measures at Minia Hospitals. **Research Hypotheses:**

After applying educational program, nurses' performances about children safety measures will be improved

Research Design:

A Quasi- experimental research design was utilized to meet the aim of this study.

II. Subjects and Methods

2.1 Subjects:

A convenient sample of 45 nurses (25 nurses from Minia University Hospital, 10 nurses from Minia General Hospital and 10 nurses from Masr Elhora Hospital).

2.2 Setting of the study:

This study was conducted at pediatric medical departments & critical care unit in Minia University Hospital for obstetrics & pediatrics, General Hospital and Masr Elhora Hospital.

2.3 Tools of data collection:

Three tools were developed by the researcher for collecting data which are:

Tool I: A structured interview questionnaire sheet in an Arabic language it was designed by the researcher after reviewing of the related literature. Tool I consist of two parts:-

Part (1): Personal data of nurses includes sex and age of nurses, qualification, years of experience ... etc.

Part (2): Nurses' knowledge related to child safety. definition of children safety, children goals in hospital, safe environment, rights of sick child, causes of accidents in hospital, risk factors which affecting child safety, international patient safety goals, nurse role in improving child safety at hospital, how to prevent bedsores, standard precautions about infection control in hospital, data should be available at identification bands, when use identification bands. After panel judgment knowledge divided into five parts:

1. It concerned with nurses knowledge about children hazards may be take place in the unit such as **medication error**, it consists of (4) questions about definition, causes of medication error, mistakes and management of medication error.
2. Knowledge of the studied nurses regarding **fire hazard**, it consists of (6) questions about; causes of fire, types of fire extinguisher, characteristics of fire extinguisher, precautions to be taken before starting use fire extinguisher, how to use fire extinguisher and fire prevention.
3. Knowledge of the studied nurses regarding **electricity hazard**, it was consisted of (4) questions about; definition of electricity hazards, causes of accidents resulting from the use of electricity, ways to prevent due to electricity hazards and ambulance methods in the event of an accident due to electricity.
4. Knowledge of the studied nurses regarding **children falling**, it consisted of (2) questions about; causes of children falling and way to children falling.
5. **policy about child safety at hospital** as child identification, the effectiveness of communication among caregivers, the safety of high alert medications, reduce the risk of health care associated infections, policy to reduce child fall. This last part will be used in pre/test assessment only.

Tool II :- safety attitudes questionnaire to Measure safety attitude was consisted of 32 questions, each of the questions is answered using a 5 point Likert scale (disagree strongly, disagree slightly, neutral, agree slightly, agree strongly) was adapted from (**Sexton et al., 2006**)

Tool II: Observational checklist was developed by the researcher that were adopted from (**Healthy children org., 2013; Hales et al;2013**) Certain modifications was done by the researcher in the checklists to suit the nature of the study. It will be used to assess the safety of nursing care for the children in hospital it included the procedures of hand washing, infection control precaution, Peripheral Intravenous Line Placement, oxygen therapy and suctioning.

Scoring system

The studied nurses answers were compared with the model key answer where 2 scores was given for complete correct answer, 1 score was given for incomplete correct answer and 0 score for wrong answer and unknown answer. According to the nurse's responses, their total level of knowledge was categorized as the following:

- Satisfactory level: ($\geq 75\%$)
- Unsatisfactory level: ($50 - < 75\%$)
- Don't know: ($< 50\%$).

Scoring system for attitude of the studied nurses were calculated as the following:

All attitude variables will be weighted as (1) score for disagree strongly, (2) score for disagree slightly, (3) score for neutral, (4) score for agree slightly, (5) score for agree strongly.

- Negative attitude (1-54)
- Average attitude (55-107)
- Good attitude (108-160)

Scoring system for practicing nursing care will be calculated as the following:

Performances step will be weighted as: 0 for not done, 1 for incomplete done, and 2 for completely done, for each procedure total score was scored as:

- Complete: ($\geq 75\%$)
- Incomplete: ($50 < 75\%$)
- Not done: ($< 50\%$).

2.4 Validity:

The tool was tested for content validity by a jury of five experts in the field of pediatric nursing and necessary modifications were done. The tool was tested for internal consistency after developing the tools.

2.5 Reliability:

Reliability of the tools was performed to confirm its consistency by using Cronbach's alpha test. It was (0.79) for Structured interviewing questionnaire and knowledge of the studied nurses regarding child safety, (0.83) for tool two which assessing attitude of the studied nurses relate children safety and (0.86) for tool three which assessing performance of the studied nurses related to children safety.

2.6 Pilot study:

After developing the tools, a pilot study was conducted on 5 nurses (10% of the total sample). A pilot study was conducted for purpose to testing clarity, completeness and to determine the time involvement. Results of the pilot study illustrated that no any refinements and modifications needed so the subjects were include to the actual sample

2.7 Ethical Consideration:

A written approval was obtained from the research ethical committee of the Faculty of Nursing, Minia University. The purpose of this study was explained for every nurse each nurse has right to agree or refuse participation in the study. Oral informed consent was obtained from nurses who participated in this study. They also informed that the information obtained will be confidential and will be used only for the purpose of the study. Each assessment sheet was coded and nurses' name did not appear on the sheets in the purpose of anonymity and confidentiality.

2.8 Educational program:

The education program was designed by the researchers, based on the results obtained from the assessment phase. It was designed to improve nurse's knowledge and practices regarding nurses' performances about children safety measures. The intervention consisted of details about meaning children safety, children safety goals at hospital, basics for safe environment at hospital, rights of sick child and Identify causes of accidents at hospital; beside, errors may be take place in the unit as medication error, children falling, electricity hazard and firing and practices regarding hand washing, oxygen therapy and suctioning and other procedure regarding children safety measures.

2.9 Field Work

An official permission to conduct the proposed study was obtained by the researcher from the manager of Minia University, General Hospitals and Masr Elhora Hospital. Also the official approval for data collection was obtained from the medical and pediatric critical care consultants of the study setting after explanation of the

purpose of the study. Also verbal consent was obtained from each nurses participated in the study. Clarification of the nature and purpose of the study was done on initial interview with each nurse.

Collection of data was started from the beginning of July 2018 to the end of January 2019, two days per week from 9 am: 12 pm by rotation at each study setting. Nurses are divided into 11 groups according to work and place conditions, each group consists of 4 nurses except one group which consists of 5 nurses.

Total time of the program was 7months, two groups are trained every 14 days (6 days\week), and the total duration of the program was 27 hours, 1 hour orientation, 2 hours pretest and 24 hours for the program sessions. Implementation of the program was done for each group with 13 hours theoretical and 11 hours practical ,the program sessions was 12 sessions for each group, each session lasted (60- 120 minutes), two sessions per day for theoretical part, one session per day for practical part.

Different teaching methods were used such as lecture, group discussion, pictures, feedback, sharing experience, poster, brochure, demonstration and re-demonstration and videos to easily understand and demonstration use also handout Arabic booklet with pictures. Motivation and reinforcement were by praising and recognition to encourage the nurses to participate in the program.

Assessment of nurses was being done 2 times using the same study tools. First assessment was done before the program through assessing nurses' knowledge and attitude about children safety, the tools were filled individually by the nurses then the researcher observed nurses practice during their actual nursing care; the observational checklists tools were filled by the researcher. Then the researcher implemented the program and second assessment was done immediately after the implementation of the program to evaluate effect of education program.

Limitation of the study:

1. Work load of nurses was an obstacle as the researcher was waiting for a long time to start the session with participants, also this caused some participants to be tired to listen and has low concentration and need continuous repetition, which required a lot of time and effort.
2. Interruptions during conducting sessions by other staff members.

Statistical analysis:

Data were collected, revised, verified, coded, then entered PC for statistical analysis done by using IBM SPSS statistical package version 20. Data were analyzed and expressed using descriptive statistics, for qualitative data: number (N) and percentage (%), for quantitative data: mean (X~) and standard deviation (SD) and Kolmogorov- Smirnov for normality test was used to differentiate between parametric data and non-parametric data. inter-group comparison of categorical data was performed by using Wilcoxon signed-rank test (Z, P-value), using spearman correlation coefficient test was used P value ≤ 0.05was consider statistical significant difference and P value ≤ 0.001 was considered highly significant difference in all analyses.

III. Results:

Table (1): Distribution of the Studied Nurses according to their Socio-Demographic Characteristics (No. = 45).

Item	No.	%
Age		
• >20	11	24.4
• 20<30	22	48.9
• 30<40	12	26.7
• >40	0	0
Mean ± SD	27.22 ± 16.227 years	
Sex		
• Male	10	22.2
• Female	35	77.6
Years of experience		
• 1 < 5	14	31.1
• 5 <10	19	42.2

•	≥ 10	12	26.7
Mean ± SD		7.56±11.674	
Working units			
•	Pediatric unit	35	77.8
•	Pediatric ICU	10	22.2
Attendance of training programs related to children safety at hospital			
•	NO	43	95.6
•	YES	2	4.4

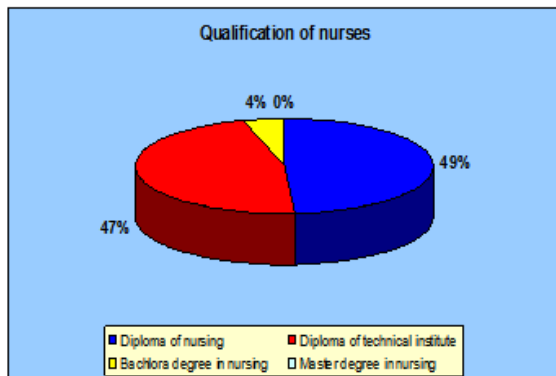


Figure (1): Distribution of the Studied Nurses according to the Qualification of Nurses (No. = 45).

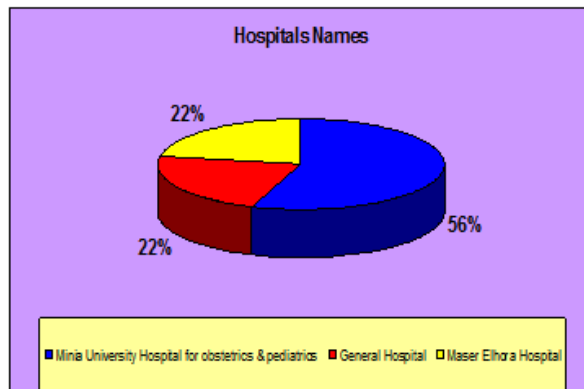


Figure (2): Distribution of the Studied Nurses according to their Hospitals Names (No. = 45).

Table (2): Distribution of Total Knowledge of Studied Nurse's related to Children Hazards in Hospitals in Pre and Post/Test:

Phases	Pretest						Immediate post test						Z	P-value
	Satisfactory level		unsatisfactory level		Don't Know		Satisfactory level		unsatisfactory level		Don't know			
	No	%	No	%	No	%	No	%	No	%	No	%		
Children safety in hospital	0	0.0	45	100	0	0.0	28	62.2	16	35.6	1	2.2	5.757	.000**
Medication error in hospital	1	2.2	10	22.2	34	75.6	30	66.7	15	33.3	0	0.0	6.092	.000**
Firing hazards in hospital	0	0.0	0	0.0	45	100	35	77.8	8	18.8	2	4.4	6.708	.000**
Electricity hazards in hospital	3	6.7	30	66.7	12	26.6	32	71.1	9	20.0	4	8.9	6.082	.000**
Children falling in hospital	0	0.0	45	100	0	0.0	35	77.8	8	18.8	2	4.4	6.708	.000**
Total	4	8.9	37	82.2	4	8.9	40	88.9	3	6.7	2	4.4	6.075	.000**

**A highly statistical significant difference (P < 0.001)

Table (3): Distribution of Studied Nurse's Practices related to Children Safety in Hospital in Pre and Post/Test:

Phases Items	Pretest						Immediate post test						Z	P- value
	Satisfactory level		Unsatisfactory level		Don't know		Satisfactory level		Unsatisfactory level		Don't know			
	No	%	No	%	No	%	No	%	No	%	No	%		
Hand washing	4	8.9	41	91.1	0	0.0	40	88.9	3	6.6	2	4.4	6.403	.000**
Infection control	0	0.0	8	17.8	37	82.2	26	57.8	15	33.3	4	8.9	5.795	.000**
Oxygen therapy	3	6.7	34	75.6	8	17.8	25	55.6	18	40.0	2	4.4	4.704	.000**
Suction procedure	8	17.8	36	80.0	1	2.2	34	75.6	10	21.7	1	2.2	6.083	.000**
Peripheral Intravenous Line Placement	7	15.6	36	80.0	2	4.4	33	73.3	9	20.1	1	2.2	6.083	.000**

**A highly statistical significant difference (P < 0.001)

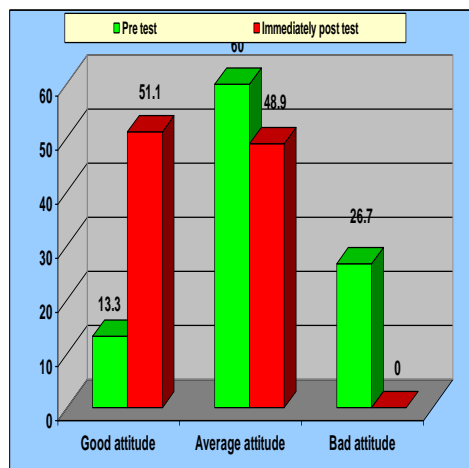


Figure (3):Distribution of Total Attitude toward Children Safety at Hospital in Pre and Post/ Test:

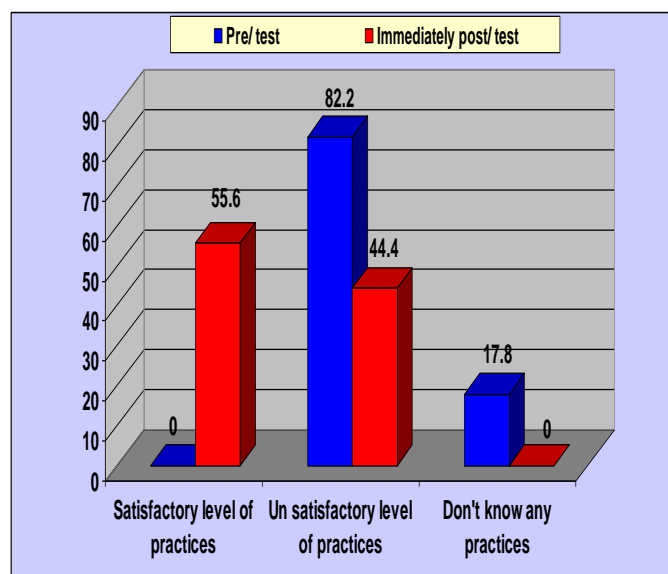


Figure (4): Distribution of Total Practices of Studied Nurse's related to Children Safety in Hospitals in Pre and Post/Tests:

Table (4): Correlation Coefficient between Nurse's Total Knowledge, Attitude and Practice Scores in Pre and Post/Tests:

Variable	Pre /test		Immediately post/ test	
	R	P	R	P
total attitude score	.160	.295	.378	.010*
total practice score	.664	.000**	.601	.000**

*A statistical significant difference (P <0.05)

**A highly statistical significant difference (P < 0.001)

Table (1)& figure (1 and 2) Illustrated that more than half (55.6%) of the studied nurses was working in Minia University Hospital for obstetrics & pediatrics, while more than two fifth (48.9%) of the studied nurses had age 20<30years old with a mean of age 27.22 ± 16.227 years. Less than half (48.9%) of the studied nurses their qualification were diploma of nursing, On the other hand, the majority of the studied nurses (77.8%) were working in Pediatric unit and didn't attending any training programs related to children safety (95.6%). The mean of experience (7.56 ± 11.674)

Table (2):Show that there was a highly statistical significant difference (P <0.001) in total knowledge of studied nurse's related to children hazards in hospitals in of favor of post/test.

Figure (3):Show that there were highly statistical significant differences (P < 0.001) in studied nurse's total attitude toward children safety at hospital in favor of post /test. About two third (60.0%) of the studied nurses have average attitude in pre/ test. While near to half (48.8%) of them have good attitude in post.

Table (3): Show that, the majority (91.1% and 80.0%) of the studied nurses having unsatisfactory level of practice during hand washing and Peripheral Intravenous Line Placement procedure and suction procedure in pre/test. While the majority and about three quarters (88.9%, 75.6%, 73.3% respectively) of them having satisfactory level of practice during hand washing, suction procedure and Peripheral Intravenous Line Placement procedure in post/test. While (82.2%) of the studied nurses don't done practice related to infection control measures during pre/test but in post/test more than half (57.8%, 57.6%, 55.6% respectively)of them having satisfactory level of practice related to infection control measures. in post/test. Moreover, there was a highly statistical significant difference (P < 0.001) in favor of post/test.

Figure (4): Show that there were highly statistical significant differences (P < 0.001) in studied nurse's total practices toward children safety at hospital in favor of post/ test.

Table (4):show that there are positive Correlation coefficient between nurse's total knowledge, attitude and practice scores (P <0.05 and < 0.001) in favor of post /test.

IV. Discussion

Children safety is described as the absence of preventable harm to a child during the process of health care and reduction of risk of unnecessary harm associated with health care to an acceptable minimum. An acceptable minimum refers to the collective notions of given current knowledge, resources available and the context in which care was delivered weighed against the risk of non-treatment or other treatment (Albrecht, 2015).

The aim of the current study is to evaluate the Effect of educational program on nurses ' performance regarding children safety measures at Minia Hospitals., through assess nurses' knowledge, attitude and practice regarding children safety in Minia hospitals, design and implement educational program for nurses' knowledge, attitude and practice regarding children safety in Minia hospitals and evaluate the effect of educational program for nurses' knowledge, attitude and practice regarding children safety in Minia hospitals.

In the present study, the majority of the study nurses were female (77.6),and less than half of the studied nurses age were ranged from 20<30years old with a mean of age 27.22 years and less than half of them have current job experience 5>10 years and all of them didn't attending training programs related to children safety These findings are corroborated by findings of by Ahmed, (2013)& Fayed et al., (2018) who reported that was 53.2% of them were females, 42.6% of staff nurses had experience between 5>10 years in nursing flied and 78% of staff nurses didn't attending training programs related to children safety this may be due to improper provision of training programs conduction, and lack of supervisor awareness about the importance of safety.The

training programs play important role in enhancing child safety and updating the nurse's knowledge, practice and improving attitude toward children safety. The researcher believes that attending training and educational programs by nurses especially in pediatrics unit is crucial to enhance children safety during nursing care.

Regarding studied nurse's knowledge about children hazards (child safety, Medication error firing hazards, electricity hazards and children falling) in hospital had unsatisfactory level. This could be attributed to the fact that all of nurses didn't receive any training programs about children safety as well as they didn't develop their selves with updated knowledge. While in post/test, it was noted that nurse's knowledge about children hazards had satisfactory level. This could be attributed to the aim of the study. This supported by study done by **Bahgat, et al.,(2013)** who recommended that, Staff development programs should be conducted for nurses at all levels to be aware of the significance of child safety in their work areas.

The present study revealed that, about two third of the studied nurses have average attitude in pre/test. While near to half of them have good attitude in post /test. Moreover, there was a highly statistical significant difference ($P < 0.001$) in studied nurse's total attitude toward children safety at hospital in favor of post /test. These results are in agreement with those of **Brasaitte et al., (2015)**: entitled of "Healthcare professionals' knowledge, attitudes and skills for patient safety" who found that they have positive safety attitudes to contextual issues and procedures, to event reporting and an improvement was found in safety practice after health professionals had received training.

In relation to the performance of studied nurses about child safety measures, the present study showed that, the majority of the studied nurses have unsatisfactory practices related to children safety in pre/test, while about three quarter and more than half of them have satisfactory practices related to children safety in post/ test. These results are consistent with those of **Fayed et al., (2018)**, Who showed that, more than two third of the studied nurses have incompetent practices related to children safety in pre intervention, while more than half of them have competent practice related to children safety in post intervention.

Correlation coefficient between total knowledge, attitude and practice scores, the present study revealed that there is positive correlation coefficient between nurse's total knowledge, attitude and practice scores ($P < 0.05$ and < 0.001) in favor of post/ test. This means that nurses' received adequate knowledge and information and they demonstrate that, leading to improve in their practices. Consistent with **Fayed, et al.,(2016)** entitled "effect of instructional program on nurse's compliance with universal precautions of infection control" who revealed that a statistically significant positive correlation coefficient between total knowledge and practice scores in favor of post /test.

V. Conclusion:

Based on the findings of the present study it was concluded that: there was highly statistically significant difference between knowledge, attitude and practice of the studied nurses regarding children safety during pre & post/tests regarding children safety. This conclusion leads to the acceptance of the study hypothesis that after applying educational program for nurses' performance regarding children safety; nurses' performance will be improved in Mini hospitals. In addition, the booklet which distributed during program as a handout was supported the nurses' knowledge.

Recommendations: Based on the findings of the present study the following is recommended:

- Increase awareness and follow up among nurses through educational program on children safety for nurses who working at pediatric departments to improve their knowledge, attitude and performance
- Developing periodical in-service training programs regarding children safety for the nurses working at pediatric departments to improve their knowledge, attitude and performance and to be aware of the significance of child safety in their work areas.
- Designing children safety guidelines as each hospital policy to provide safe work environment for nurses and children to reduce the occurrence of errors.
- Coordination between all healthcare team members especially physicians, pharmacists and improve their role to reduce medical errors and promote children safety.
- Supporting more research efforts particularly in areas that yield the greatest benefit and that more effectively contribute to improving child' safety and safe child' lives.

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