

Impact of an Educational Program in Improving Nurses' Performance among Restrained Children

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Abstract:

Background: Physical restraint is protective measures used to limit children movement. **Aim of the study:** to identify the impact of an educational program in improving nurses' practice among restrained children. **Subjects and Methods: Research design: A quasi experimental design . Setting:** Intensive care unit & Nutritional Department at Pediatric hospital as well as Pediatric Surgery Department at Surgery Hospital at Zagazig University .**Subjects:** a sample of 40 nurses and 40 restrained children.. **Tools of data collection: Two tools** were used; **first** a questionnaire sheet to collect nurses' characteristics **the second** tool was an observational checklist used to assess nurse's practice. Educational program was developed to educate the studied nurses about physical restraint. **Results** : indicated that. The studied nurses' practice had been improved significantly after implementation of the educational program either immediately or 2 months later. **Conclusion, it can be concluded** that the educational program had improved the studied nurses' practices about physical restraint. **Recommendations:** Nurses should attend formal training program about physical restraint by a qualified and competent practitioner. In addition, the development of physical restraint evidence-based guidelines is essential, to be followed and available for all nurses.

Key words: Physical restraint – educational program. Nurses' Performance, Restrained Children

Introduction

Physical restraints are widely used in hospitals in many countries, especially during critical care, against a range of difficult clinical situations. They are intended to protect children and their relatives from any harm to themselves: falling from beds, removing tubes, drains, and medical equipments from their bodies, and to ease children's control ⁽¹⁾.

Using physical restraints is a highly preferred practice in intensive care units. Most of the studies show that the main reason for restraining patients is to prevent dislodgement of medical equipment's ⁽²⁾.

Children may need to be physically or chemically restrained for various procedures, because of disruptive behavior, or to prevent injury to themselves or others. The use of restraint for a child requires clear indications, safe application, reassessment guidelines, and use only after the consideration of alternative methods ⁽³⁾

There are several types of medical manufacturers have different names for the same types of physical restraints. The most common types of physical restraints are soft wrist and ankle restraints, strap fastening vest (poesy jacket), seat belt with

buckle (restraint belt), mittens (restraint mitts) and leather wrist and ankle restraint ⁽⁴⁾

Between 7- 17 % of the hospital patients are subjected to physical restraints. Patients have strong emotional reactions to being restrained; they also feel angry and upset. The literature reports a wealth of evidence on the detrimental physical and psychological effects of physical restraints. These include hypertension, tachycardia, increased agitation, impaired circulation, aspiration, nerve and skin injury. In addition constipation, decline in functional and cognitive state as well as increased agitation and other complications associated, with immobility ⁽⁵⁾

Moreover, it is also reported that restraints have negative effects on children and their families, children feeling embarrassed in remembering the experience of being restrained. Evidence show that use of physical restraints can also lead to skin trauma, pressure sores, constipation, depression, anger, decline in functional and cognitive state as well as increased agitation ⁽⁶⁾.

Physical restraints are commonly used to reduce treatment interference risk and protect child safety. However, nurses still hold misconceptions about the use of physical restraints in acute care settings. Teaching nursing staff accurate knowledge and proper skills, cultivating positive attitudes, and rectifying irregularities in physical restraint use are all necessary to improve patient care (7).

The nurse had a great role in dealing with patient who had restraint, as

Significant of the study

death occurred in 75% from restrained patient between (1999 and 2002), 15% of these cases that involved restrained related death. Ongoing nursing education is the key to ensuring safe and appropriate children care. So this study will be prepared to assess nurse's performance and Plan and implement a health educational program for nurses about restraint.

Aim of the study

The aim of the present study was to:

Identify the impact of an educational program in improving nurses' practice among restrained children.

Research hypothesis:

Nurses' practice regarding restraint will be improved after implementation of the educational program.

Subjects and Methods

Research Design

A quasi – experimental design was used in this study

Study setting

The study was conducted at the following settings:

1. Intensive care unit at Pediatric hospital at Zagazig University Hospitals.
2. Nutritional Department at Pediatric hospital at Zagazig University Hospitals.
3. Pediatric Surgery Department at Surgery Hospital at Zagazig University Hospitals.

Study subjects

The subjects of this study will be composed of two groups:

restraints should reassess at least every 30 minutes. Assessment includes neurovascular (circulation to hands, fingers, feet, toes) and skin assessment (bruising of restrained area). Moreover, nurses should meet the patient's activities of daily living such as toileting, eating and drinking. Documentation of these interventions must be clearly identified on the patient's chart (8).

Group I: Nurses' whom actually provide direct care in the intensive care unit (20 nurses), Nutrition department (10 nurses) and pediatric surgery department (10 nurses) whom fulfill the following criteria:

- Give direct care to the restrained children.
- Had nursing diploma certificate.
- Accept to participate in the study.

Group II: All available children with physical restraint in the previous settings at the period of the study.

Tools for data collection

Tool I: A structured Interview Sheet

A structured interview sheet was developed by the researcher to collect the required data and it consists of three parts to collect the following data:

Part A: Characteristics of the studied nurses such as age, sex, years of experience, program training and qualification (Questions from 1- 8).

Part B: Characteristics of the studied children such as age, sex, diagnosis, type of restraint, cause of used restraint and any complication was found (Questions from 35-45).

Tool II: Observational checklist

An observational checklist was developed by the researcher to evaluate nurses' care provided to restrained children regarding Mummy & Glove hitch restraint. Each correct step took one point and zero for wrong one.

Scoring system

Total score of practice was 31 marks distributed as follows:

Clove hitch restraint	15 marks
Mummy restraint	16 marks

Scoring system

The total score of nurses' practice was classified as follows:

Good > 75%

Fair 50 – 75 %

Poor < 50 %

Validity and reliability:

In the present study the overall reliability of the structured interview questionnaire (Cronbach's Alpha (.886), acceptable). The structured interview sheet and observational checklist were developed after a thorough review of the related literature and then reviewed by 5 experts (two professors of pediatric nursing, two professors of pediatrics medicine and one assistant professor of community health nursing).

Field work

After identifying the nurses who fulfilled the criteria of the study, they were requested to participate in the study. The purpose of the study was explained briefly to nurses who were willing to participate. They were met by the researcher at the end of each shift at their available time (after providing nursing activities of the unit) from 3 pm and 7 pm. The researcher was available 4 days weekly. As regards the nurse's practices, they were observed in the previously mentioned settings during their actual work in different shifts.

Pilot study

A pilot study was conducted on 10% nurses to evaluate the content of the tools, their clarity as well as to estimate the time needed for filling the sheets with the collected data.

Administrative and Ethical consideration

An official permission was obtained using proper channels of communications prior to pilot study. And an informed consent was obtained from the nurses to accept to participate in the study and total confidentiality of any obtained information was ensured.

Statistical analysis

The collected data was coded and entered in a data base file using the FoxPro for windows program. After complete entry, data was transferred to the SPSS version 16.0 program by which the analysis was conducted applying

frequency tables with percentages and cross tabulations. Data is qualitative variables presented as number and percent. Regarding scoring system, the items scores for each domain were summed together then the sum of scores for each dimension and total score was calculated by summing the scores given for its responses. The tests of significance used were the Pearson's Chi-square; Friedman test and Cochran Q test.

Results

Table (1) shows that a total number of 40 staff nurses were included in this study. It was revealed that 62.5% of nurses in the age group 20 – years, and 37.5% their age from 30-45 years old, with mean age of 28.6 ± 7.1 years.

Regarding years of experience, 62.5 % of the studied nurses had less than 10 years of experience and 17.5% of them had 10-15 years, with mean of 9.6 ± 7.2 years of experience.

It was found also that 62.5% of studied nurses had diploma degree, and 17.5% had technical institute of nursing. As well as 20.0% of the nurses in the study had a bachelor degree in nursing. The same table also reported that 100% of the studied nurses never attended any previous training program about physical restraint.

Table (2) represents diagnosis and causes and duration of used physical restraint for studied children. It was found that 32.5% of the studied children had respiratory disorder and 22.5% had neurological disorder. While 20% of the studied children had metabolic disorders. Regarding causes for using physical restraint, it was found that 57.5% of the studied children were restrained for giving I.V fluids, 32.5% were restrained for preventing falling. While 20.0% of the studied children were restrained because of loss of consciousness.

Complications of using physical restraint among studied children were shown in **table (3)** it was found that 42.5% of the studied children had nothing of complications. On the other hand 35.0% had extremities edema, 30.0% had skin ulcers, while only 5.0% of the

studied children had hospital acquired infection. In relation to treatment of complications, 82.6% of the studied nurses answered yes. While only 17.4% of the studied nurses did not provide any care to complication.

When nurses were asked about measures of treating complications, 63.2% mentioned contact observation for skin changing was essential, while 42.1% reporting bed rest and continuous repositioning, as well as 26.3% of nurses reported keep child calm and dry.

Impact of educational program on nurses' practices regarding Mummy restraint represented in **table (4)**. Concerning performance phase that was done by studied nurses, it was observed that 92.5% of studied nurses' place opened sheet or blanket on flat surface with one corner before implementing the educational program and 100% immediately after program implementation slightly decreased to 97.5% in follow up phase. Regarding secure beneath left side of body 15.0% of nurses did it before program, this percentage improved to 32.5% after implementation of educational program then to 17.5% during follow up phase. These results were statistically significant.

Regarding wash hands after procedure, it was done by 17.5%, 45.0% and 25.0% of the studied nurses in before, after and follow up phase respectively. The difference was statistically significant (Cochran test was 10.2*). While, recording after the procedure it was done by only 10.0% of the studied nurses before implementation of educational Program, compared to 42.5% after implementation of educational program and 20.0% in the follow up phase. The results were statistically significant ($P < 0.05$).

Impact of educational program on nurses' practices regarding clove hitch restraint was represented in **table (5)**. During preparatory phase it was found that 27.5% of studied nurses washed their hands before implementation of educational program, compared to 92.5% after implementation of educational

program, and 72.5% in the follow up phase. The difference was statistically significant. (**Cochran test was 35.4***).

Impact of educational program on nurses' practice score was portrayed in **figure (I)**. It revealed that only 17.5% of the studied nurses had good practice score before implementation of educational program. This percentage increased to 62.5% after implementation of educational program, and decreased to 20% in the follow up phase the difference was statistically significant (Friedman test was 39.8*).

Relation between nurses' total knowledge score & practice with their age shows in **table (6) & IV**. It was found that 12% of the studied nurses whose age was 20- years had good total knowledge score before implementation the educational program, this percentage increased to 92% and 24% respectively for both post implementing the educational program and follow up phase.

It was found also that there was no statistical significant relation throughout the three phases of the program between nurses' practice score and their age.

Table (7) illustrated the relation between nurses' total knowledge score & practice with their qualification it was found that only 4%% of the studied nurses whose had diploma degree in nursing had good total knowledge score before implementation of the educational program, compared to 80% after implementation of the educational program and 16% during follow up phase.

Regarding practice score, it was found that 16% of the studied nurses whose had diploma degree in nursing had good total practice score before implementation of the educational program, compared to 64% after implementation of the educational program and 24% during follow up phase. There were no statistical significant relations throughout the three phases of the program between nurses' practice score and their qualification.

Relation between nurses' total knowledge & practice score with their

years of experience was represented in **table (8)**. The results showed that 12%, 16% of the studied nurses whose years of experience less than 10 years had good total knowledge & practice score respectively before implementation of the educational program. This percentage increased to 84%, 72% respectively after implementation of the educational program and 16%, 24% respectively during follow up phase.

Table (9) represents relation between total knowledge score and total practice score. It was found that there was statistical significant relation between total knowledge score and total practice score throughout post phase of implementation of educational program.

Discussion

Physical restraint is a piece of equipment or device that restricts a child's ability to move. Restraints may keep a child from getting out of bed or moving arms and legs excessively. As well as restraints are used to control a child who is in danger of harming the self or others. It is sometimes necessary to restrain children who may not be capable of remaining still when they are frightened or in pain during some procedures. The use of physical restraints in the health care area should be used as a last-resort option ⁽²⁾.

For the medical diagnosis of the studied children, Demir, ⁽⁹⁾ who conducted a study to determine pediatric nurses' ideas and attitudes towards physical restraint in Turkey and mentioned that about nearly one third (30.2%) of the restrained patients had respiratory disorders. This finding agreed with the present study which revealed that nearly one third (32.5%) of the restrained children had respiratory disorders. This may be because critically ill children with respiratory disorders are always in need for monitoring and supportive respiratory devices and/or tubes. As well as monitoring and supportive respiratory devices and/or tubes may range from simple devices, such as; simple masks, nebulizers, or arterial catheters to the more sophisticated devices, including;

mechanical ventilators which most commonly need intubation either by endotracheal or a tracheostomy tube. Therefore, the main reason for restraining these children may be maintaining and preventing the removal of supportive respiratory devices.

Concerning duration of applies physical restraint, the present study revealed that more than two fifth (42.5%) of the studied children were restrained according to the child case. This result may be due to severity of child case need to long time of restraint. This finding agrees with Akansel ⁽²⁾ who conducted a study to determine the use of physical restraints, ongoing practices and perceptions about physical restraints among intensive care unit nurses in Turkey, mentioned that nearly half (48%) of the restrained patients the duration of restrained depends on their condition.

The results of the current study showed that more than one third (35.0%) of the restrained children had extremities edema as a complication of physical restraints. This result may be due to the hospitals policy not having protocols for protecting children from complication of using of physical restraints that lead to serious life threatening conditions for restrained patients. On contrary, Choi and Song ⁽¹⁰⁾ in a study of physical restraint use in a Korea they found that the majority of their patients had edema at the restrained extremity related to the use of physical restraints.

The present study showed that there was a statistical significant relation throughout the three phases of the program ($p=0.000$). In addition regarding clove hitch restraint. During preparatory phase it was found that the majority (92.5%) of the studied nurses wash their hands before procedure after implementation of educational program, the difference was statistically significant throughout three phases ($p=0.000$).

This result may be due to implementation of educational program and use standards of infection control protocols. This finding was in a harmony with Ismail et al., ⁽¹¹⁾ who conducted a study to evaluate nursing intervention

offered to premature neonates at neonatal intensive care unit in Zagazig University, found that almost all nurses wash their hands before any procedure.

Also this finding was contradicting to a study in nurses' compliance to standards of nursing care in performing invasive procedures in Zagazig University conducted by Saleh et al.,⁽¹²⁾ who showed that despite the wide spread of knowledge about importance of hand washing among most nurses who had satisfactory level of knowledge regarding hand washing; it was not practiced by most of them.

Ismail et al.,⁽¹¹⁾ showed that the highest score was for preparing supplies and equipment. This finding was in a harmony with the present study which revealed that the most (87.5%) of the studied nurses prepared the necessary equipments before implementation of educational program.

Lastly, the interrelationships among the various study outcomes, namely knowledge and performance were investigated in the current study. Analysis of data revealed that no statistically significant relation was found between nurse's knowledge about physical restraint and neither their age nor their years of experience. This result may be due to that nurse's knowledge need to be updated to be efficient in relation to physical restraint as they must attend continuous health education programs to be aware about new trends in physical restraint. These finding are consistent with Saleh et al.,⁽¹²⁾ and Ahmed et al.,⁽¹³⁾ who conducted a study of nurses' performance regarding infection control for patients with central venous catheter at Zagazig University. Also Gad Allah et al.,⁽¹⁴⁾ who conducted a study of assessment of nurses' performance in premature units at Zagazig University and who found that no statistical significant relation between nurse's level of knowledge and their age and years of experience.

These findings are consistent with Ali et al.,⁽¹⁵⁾ who conducted his study at Zagazig University to assess first aid and hospital care provided to burned children

and the expected outcomes and reported that age and years of experience have insignificant effect on knowledge.

The current study revealed that there was no statistically significant relation between nurse's knowledge about physical restraint and level of education. This result may be due to the relation between knowledge and level of education could be different. Higher educational level did not necessary lead to increased knowledge unless there is updating of knowledge through continuing nursing education. This was in a line with Saleh et al.,⁽¹²⁾ and Gad Allah et al.,⁽¹⁴⁾ who's found that there is no statistical significant relation between nurse's level of knowledge and level of education.

Saleh et al.,⁽¹²⁾ found that there is no significant statistical relation between nurse's practice and years of experience. This goes in line with the current study which showed no relation between nurse's practice and years of experience. This could be explained as senior nurses who have prolonged years of experience took administrative role and delegated the nursing activities to the junior nurses. So, they were far away from the practical field and consequently their mastering skills were decreased or diminished. Accordingly, the unit should be provided with a head nurse for guidance and feedback and reinforcement as well as punishment.

The present study revealed the positive relation between nurse's knowledge and their practice. This result may be due to that knowledge alone without practice had no effect. This finding agrees with Soliman et al.,⁽¹⁶⁾ in his study to assessment of intensive care unit nurse's knowledge and practice of infection control precautions at Zagazig University who found that there was positive relation between nurse's knowledge and their practice as an increase in knowledge scores lead to an increase in practice score. This agrees with Ahmed⁽¹³⁾ who found that there was a highly significant relation between nurse's level of knowledge and level of practice.

Finally, there was positive relation between total knowledge score and total practice score. This result may be due to that knowledge with practice improved nursing care for physical restraint, as well as it was also found that knowledge alone or practice alone had no effect. This finding is in harmony with Soliman et al.,⁽¹⁶⁾ who stated that there was positive relation between nurses' knowledge and practice. This was inconsistent with Mohammed et al.,⁽¹⁷⁾ in his study to assess nurses' practice and adverse health effects on nurses dealing with chemotherapy agents at Zagazig University who found that there were no significant relation between nurses' knowledge and practice. The present study might draw the attention to nurses' knowledge and their practice in order to motivate nurses to improve their knowledge and practice.

Conclusion:

In the light of the current study findings, it might be concluded that the educational health program to nurses' have a profound effect on improving their

knowledge and practice about physical restraint as there was a statistical difference throughout the three phases of the study.

Recommendations:

In the light of the findings of the current study, the following recommendations are suggested:

- Pre service training for newly recruited nurses will help to update their knowledge and improve their practice.
- Nurses should attend formal training program about physical restraint by a qualified and competent practitioner
- Adequate head nurse for supervision, guidance, and regular feed back to nurses about their performance should be provided.
- The importance of developing physical restraints evidence-based guidelines, which should be available in all hospitals to be followed by all nurses.
- Legal implications of poor documentation in nursing practice and the frequency of documentation for checking physical restraint should be stressed.

Table (1) Characteristics of the Studied Nurses

Characteristics	No	%
Age/Years		
▪ 20-	25	62.5
▪ 30-45 years	15	37.5
X_̄±SD 28.6±7.1		
Marital status		
▪ Single	13	32.5
▪ Married	25	62.5
▪ Widowed	2	5.0
Qualification		
▪ Diplome	25	62.5
▪ Institute	7	17.5
▪ Bachelor	8	20.0
Experience/ Yeras		
▪ <10	25	62.5
▪ 10-15	7	17.5
▪ >15 years	8	20.0
X_̄±SD 9.6±7.2		
Department		
▪ NICU	20	50.0
▪ Nutrition	10	25.0
▪ Ped. surgery	10	25.0
Training Program		
▪ No	40	100.0
▪ Yes	0.0	0.0

Table (2): Diagnosis of the studied children and uses, duration of physical restraint

Medical data	No	%
Diagnosis		
▪ Respiratory disorder	13	32.5
▪ Metabolic disorder	8	20.0
▪ Neurological disorder	9	22.5
▪ Surgical disorder	10	25.0
Department		
▪ PICU	20	50.0
▪ Nutrition	10	25.0
▪ Pediatric surgery	10	25.0
Causes\$		
▪ IV fluids	23	57.5
▪ Prevent child falling	13	32.5
▪ Avoid machines detachment	10	25.0
▪ Excitement	10	25.0
▪ To protect surgery site	10	25.0
▪ Nutrition tube	9	22.5
▪ Loss of consciousness	8	20.0
Duration		
▪ 2 hrs	12	30.0
▪ 4	1	2.5
▪ 8 hrs	10	25.0
▪ According to child case	17	42.5

\$ More than one answer was allowed

Table (3) Complications of physical restraint among Studied Children

Complications	No	%
Complications\$		
▪ Extremities edema	14	35.0
▪ Skin ulcers	12	30.0
▪ Cyanosis of tighten place	3	7.5
▪ Hospital acquired infection	2	5.0
▪ Nothing	17	42.5
Treated complications		
▪ No	4	17.4
▪ Yes	19	82.6
If yes, mention\$		
▪ Contact observation of skin changes	12	63.2
▪ Hot foment for tighten place	8	42.1
▪ Bed rest and continuous repositioning	8	42.1
▪ Keep child calm and dry	5	26.3
▪ Avoid contact with diseased persons	1	5.3
▪ Sports	1	5.3

\$ More than one answer was allowed

Table (4): Impact of Educational Program on Nurses' Practice Regarding Mummy Restraint throughout the Program Phases.

Mummy restraint	Study phase						Q	P
	Before		Post		Follow up			
	N o	%	N o	%	N o	%		
Before procedure								
1- Wash hand	7	17.5	23	57.5	18	46.2	22.3	0.00
2- Prepare the necessary equipments	28	70.0	35	87.5	33	82.5	11.4	0.00
3- Explain the procedure for caregiver	13	32.5	24	60.0	21	52.5	14.9	0.00
4- Stay with distressed child	2	5.0	4	10.0	2	5.0	1.6	0.449
During procedure								
1- Place opened sheet or blanket on flat surface with one corner	37	92.5	40	100.0	39	97.5	3.5	0.174
2- Place infant on blanket with shoulders at blanket fold	31	77.5	38	95.0	37	92.5	9.6	0.008*
3- Place infant's right arm straight against side of the body	24	60.0	36	90.0	38	95.0	20.2	0.00
4- Pull side of blanket on right side firmly across right side of body	37	92.5	38	95.0	37	92.5	11.1	0.00
5- Secure beneath left side of body	6	15.0	13	32.5	7	17.5	7.2	0.028*
6- Place left arm straight against side of the body	21	52.5	32	80.0	24	60.0	12.9	0.00
7- Bring remaining side of blanket across left shoulder	35	87.5	40	100.0	39	97.5	7.0	0.030*
8- Secure beneath body	8	20.0	11	27.5	9	22.5	1.2	0.558
9- Fold lower corner and bring up to shoulders and secure	16	40.0	30	75.0	20	50.0	14.9	0.00
10- Fasten in place with safety pins or tape	9	22.5	14	35.0	7	17.5	5.6	0.062
After procedure								
1- Wash hands	7	17.5	18	45.0	10	25.0	10.2	0.00
2- Recording	4	10.0	17	42.5	8	20.0	16.6	0.00

Q: Cochran Q test for several related samples
P < 0.05 (significant).

Table (5): Impact of Educational Program on Nurses' Practice Regarding Clove Hitch Restraint throughout the Program Phases.

Clove hitch restraint	Study phase						Q	P
	Before		Post		Follow up			
	No	%	No	%	No	%		
Before procedure								
1- Wash hand	11	27.5	37	92.5	29	72.5	35.4	0.000*
2- Prepare the necessary equipments	35	87.5	40	100.0	38	95.0	14.0	0.001*
3- Explain the procedure for caregiver	15	37.5	24	60.0	15	37.5	10.1	0.006*
4- Stay with distressed child	1	2.5	3	7.5	2	5.0	1.0	0.607
During procedure								
1- Pad the wrist or ankle with the gauze dressing	35	87.5	40	100.0	39	97.5	7.0	0.030*
2- Tape the dressing to secure it in place, make sure is not too tight	11	27.5	32	80.0	13	32.5	30.7	0.000*
3- Make a double loop:	19	47.5	36	90.0	32	80.0	20.1	0.000*
- Pick up the loops	20	50.0	31	77.5	21	52.5	11.1	0.004*
- Slip the wrist or ankle through the two loops	31	77.5	39	97.5	34	85.0	7.0	0.030*
- Tie the ends to the bed frame under the mattress using a square knot	35	87.5	40	100.0	38	95.0	5.4	0.066
4- Check every two hours	12	30.0	30	75.0	17	42.5	17.9	0.000*
5- Perform range of motion	11	27.7	26	65.0	13	32.5	18.7	0.000*
After procedure								
1- Wash hands	6	15.0	25	62.5	14	35.0	23.7	0.000*
2- Recording	6	15.0	26	65.0	11	27.5	29.5	0.000*

Q: Cochran Q test for several related samples

* P < 0.05 (significant)

Table (6): Relation between nurses' total knowledge & practice score with Their Age.

knowled ge	pre			post			follow											
	Poor	Fair	Good	Poor	Fair	Good	Poor	Fair	Good									
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Age																		
/years	1	48.	1	40.	3	12.	0	0.	2	8.0	2	92.	4	1	15	60.	6	24.
20-years	2	0	0	0	3	0	0	0	6	40.	3	0	3	6.	10	0	2	0
30-	3	20.	9	60.		20.		0.		0	9	60.			66.		13.	
45years		0		0		0		0		0		2		7		3		
												0.						
												0						
	MCP 0.457			MCP 0.209			MCP 0.316											
Practice	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Age																		
/years	8	32.	1	52.	4	16.	0	0.	7	28.	1	72.	2	8.	17	68.	6	24.
20-years	6	0	3	0	3	0	0	0	8	0	8	0	3	0	10	0	2	0
30-		40.	6	40.		20.		0.		53.	7	46.		2		66.		13.
45years		0		0		0		0		3		7		0.		7		3
												0						
												0						
	MCP 0.763			MCP 0.109			MCP 0.446											

MCP: P value based on Mont Carlo exact probability
 !: P value based on Mont Fisher exact probability

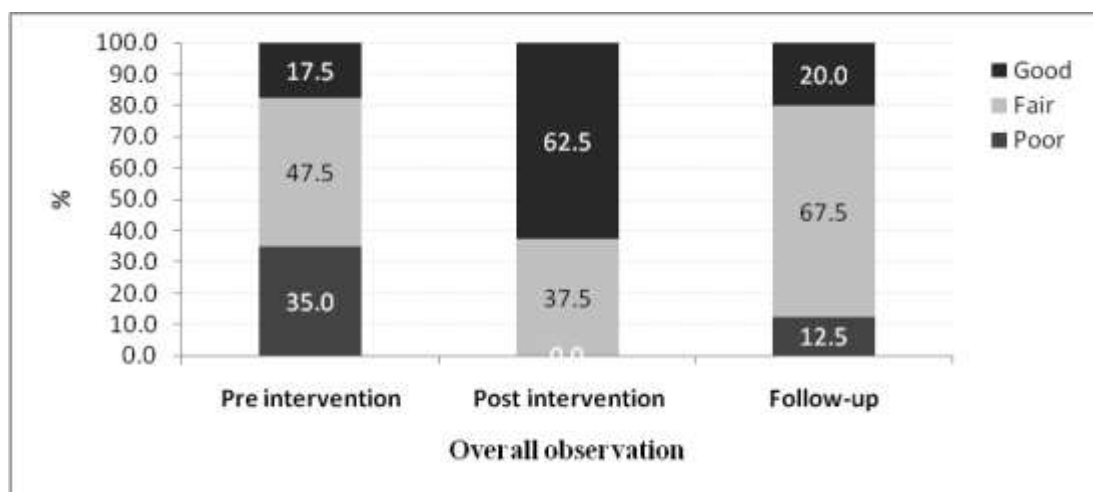


Figure (I): Total Nurses' practice score.

Table (7): Relation between nurses' total knowledge & practice score with Their Qualification.

knowledge	pre						post						follow					
	Poor		Fair		Good		Poor		Fair		Good		Poor		Fair		Good	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Qualification																		
Diplom	2	88.	2	8.0	1	4.0	0	0.	5	20.	2	80.	2	8.0	1	76.	4	16.
Institute	2	0	4	57.	1	14.	0	0	3	0	0	0	1	14.	9	0	1	0
Bachelor	2	28.	5	1	1	3	0	0.	5	42.	4	57.	1	3	5	71.	1	14.
	2	6		62.		12.		0		9	3	1		12.	6	4		3
		25.		5		5		0.		62.		37.		5		75.		12.
		0						0		5		5				0		5
	MCP 0.652						MCP 0.152						MCP 0.710					
Practice	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Qualification																		
Diplom	1	40.	1	44.	4	16.	0	0.	9	36.	1	64.	3	12.	1	64.	6	24.
Institute	0	0	1	0	1	0	0	0	1	0	6	0	1	0	6	0	0	0
Bachelor	1	14.	5	71.	2	14.	0	0.	5	14.	6	85.	1	14.	6	85.	2	0.0
	3	3	3	4		3		0		3	3	7		3	5	7		25.
		37.		37.		25.		0.		62.		37.		12.		62.		0
		5		5		0		0		5		5		5		5		5
	MCP 0.432						MCP 0.109						MCP 0.365					

MCP: P value based on Mont Carlo exact probability

!: P value based on Mont Fisher exact probability

Table (8): Relation between nurses' total knowledge & practice score with Their Years of Experience.

knowledge	pre						post						follow					
	Poor		Fair		Good		Poor		Fair		Good		Poor		Fair		Good	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Experience	MCP 0.526						MCP 0.442						MCP 0.732					
<10 years	2	80.	2	8.0	3	12.	0	0.	4	16.	2	84.	4	16.	1	68.	4	16.
10-15 years	0	0	5	71.	1	0	0	0	1	0	1	0	1	0	7	0	4	0
>15 years	1	14.	4	4	1	14.	0	0.	2	14.	6	85.	2	14.	2	28.	2	57.
	3	37.		50.	3	12.	0	0.	3	25.	7	75.	3	25.	4	50.	6	25.
	5				5		0		0		0		0		0		0	0

Practice	pre						post						follow					
	Poor		Fair		Good		Poor		Fair		Good		Poor		Fair		Good	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Experience	MCP 0.375						MCP 0.204						MCP 0.756					
<10 years	8	32.	1	52.	4	16.	0	0.	7	28.	1	72.	2	8.0	1	68.	6	24.
10-15 years	1	0	3	0	2	0	0	0	3	0	8	0	1	14.	7	0	1	0
>15 years	5	14.	4	57.	1	28.	0	0.	5	42.	4	57.	2	3	5	71.	1	14.
	3	62.	2	25.	6	12.	0	0.	9	62.	3	37.	1	25.	5	62.	4	12.
	5		0		5		0		5		5		0		5		5	5

MCP: P value based on Mont Carlo exact probability

! : P value based on Mont Fisher exact probability

Table: (9) Relation between Total Knowledge and Practice Score.

Knowledge	Practice		Overallpractice.pre		Overallpractice.post		Overall practice FA	
	r	P	r	P	r	P	r	P
Knowledge.pre	0.379	0.016*	0.052	0.751	0.140	0.389		
Knowledge.post	0.584	0.000*	0.373	0.018*	0.449	0.004*		
Knowledge FA	-0.127	0.435	0.098	0.547	-0.110	0.500		

r: Pearson correlation coefficient

* P < 0.05 (significant)

Interpretation of r:

Weak correlation (0.1-0.24) Intermediate (0.25-0.74) Strong (0.75-0.99)

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