

Effectiveness of Structured Teaching Programme on Knowledge Regarding Management of Critically Ill Children on Mechanical Ventilator among Staff Nurses in Government G.B. Pant Hospital, Srinagar Kashmir.

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ABSTRACT

Purpose: The aim of the study was to assess the effectiveness of structured teaching programme on knowledge regarding management of critically ill children on mechanical ventilator among staff nurses in Government G.B. Pant hospital, Srinagar Kashmir. **Method:** Pre- experimental, one group pre-test post –test research design was used. 50 staff nurses were selected by simple random sampling technique (Lottery Method) and data was collected by administering self-structured questionnaire on day 1st. After collecting data, structured teaching program was administered to the study subjects on same day and on day 7th post test was conducted by using same questionnaire. **Results:** Data was analysed and interpreted by using descriptive and inferential statistics. In pre-test out of 50 study subjects, most of the study subjects 24(48%) had poor knowledge, 22 (44%) had average knowledge, and only 4(8%) had good knowledge with a mean knowledge score of 53.70% where as in post-test most of study subjects 29 (58%) had average knowledge, 16(32%) had good knowledge and only 5(10%) had poor knowledge. The mean post-test knowledge score (35.80 ± 7.632) was greater than the mean pre-test knowledge score (26.84±8.348) with the mean difference of 8.96 at p <0.001. A statistically significant association was found between pre-test knowledge scores of study subjects with their demographic variables i.e Professional qualification (p=0.0058) and Clinical experience in pediatric ICUs (p=0.00628), whereas no significant association was found with other demographic variables as Age (0.18) and Clinical experience in pediatric wards (0.93) at p ≤ 0.05. **Conclusion:** Structured teaching programme improved the knowledge of staff nurses regarding management of critically ill children on mechanical ventilator.

Key Words: Structured teaching programme, Critically ill children, Mechanical ventilator, Staff nurses, Complications.

1.INTRODUCTION

WHO established the external Child Health Epidemiology Reference Group (CHERG) in 2001 to develop estimates of the proportion of deaths in children younger than age 5 years attributable to pneumonia, diarrhoea, malaria, measles, and the major causes of death in the first 28 days of life. According to the World Health Organization, the major causes of death in under-five-year-old children in developing countries are preventable and curable. In 2000-03, six causes accounted for 73% of 10.6 million yearly deaths in children younger than age 5 years: pneumonia (19%), diarrhoea (18%), malaria (8%), neonatal pneumonia or sepsis (10%), preterm delivery (10%), and asphyxia at birth (8%).¹ Improving outcome is possible by well-equipped and well-staffed intensive care units, since dra-

matic decreases in mortality and morbidity have been documented by such measures.^{2,3} Intensive care could reduce mortality rates by 15% to 60%,² and many studies have demonstrated its unquestionable benefit.^{4,5}

Critical illness is life threatening event that disturb the full system of an individual. Critical illness affects physical, psychological, socio-cultural and spiritual level of individual. The critically ill patients requiring mechanical ventilation for survival include children as well as adults. The disease conditions requiring mechanical ventilation also range from genetic conditions to acquired conditions like trauma and post-operative complications. The indications for mechanical ventilation includes respiratory arrest, acute lung injury, critical illness, neuromuscular dysfunction, and respiratory support following surgery.⁶

Mechanical ventilation is a method to mechanically assist or replace spontaneous breathing.⁷ It may involve a machine called ventilator. The overall aims of mechanical ventilation are to optimize gaseous exchange, clients' work of breathing and client comfort. The critically ill children are first intubated by securing the tube (Endotracheal tube) in trachea and the process is known as Endotracheal Intubation. Endotracheal intubation can be accomplished by nasal (Naso-tracheal), oral (Oro-tracheal) or direct tracheal (Tracheostomy) routes.⁸ In other circumstances simple airway manoeuvre's, an oropharyngeal airway or laryngeal mask airway may be employed. If the patient is able to protect their own airway such as in non-invasive ventilation or negative-pressure ventilation then no airway adjunct may be needed.⁷

Begum A, Shashikala V, Kumar CS⁸ conducted a prospective study in 2016 to determine the characteristics and outcome of ventilated patients in the PICU in a tertiary care teaching hospital, Hyderabad Telangana, India. Study findings revealed that a total of 144 (23%) cases admitted in PICU were ventilated over the period of six months. Male to female ratio was 1.36: 1. Neurological (27.8%) and respiratory (25.6%) cases were found to be the commonest indicators of ventilation in the study. The average ventilator stay was 2.4 days and hospital stay was 9.71 days. Out of 144 ventilated cases, 71(49.3%) were discharged, 10(6.9%) cases Left Against Medical Advice (LAMA) and 63(43.8%) cases died. 51% of ventilated cases were infants and 81% of total deaths occurred under five years age group. Mortality was significantly higher among cases of Hepatic encephalopathy, DKA, MODS, Congenital heart diseases and Poisonings. Neurological cases had a better outcome (64%) among all the cases. MODS on admission had 73% mortality. The study recommended the need to strengthen PICU to improve the quality care for the better survival of critically ill children.

Need of the study

According to WHO, 140 million children are born every year, of which 5 million children dies in the first month of life in the developing countries. During the 20th century, amazing progress has been made in the scientific and technological field, due to which the care of children has improved in recent decades⁹

All over the world, many children are dying in Paediatric intensive care units. Excluding trauma and other serious illness number of deaths happens due to ventilator associated complications and care giver's error. Lot of mistakes happens in Pediatric intensive care units due to lack of knowledge among nurses regarding the ventilator care. Due to inadequate care among critically ill children on mechanical ventilator some complications like nosocomial infections, bed sore, tracheal stenosis and displacement of the tube occur in Pediatric ICU children. Sometimes severe complications occur due to ventilator malfunction. It is important to recognize the complications and rectify them early to avoid mortality. Training of nurses working in the critical care setting is of paramount importance in preventing most of the complications.¹⁰ The researcher noticed that the nurses have inadequate knowledge regarding management of critically ill children on mechanical ventilator, because of which they were not able to provide quality care to children on mechanical ventilator. This leads to the development of complications like bedsores, nosocomial infections especially VAP, nutritional deficiencies, deep vein thrombosis, Lung injury etc. Discussion with experts and review of literature helped the researcher to realize that preventing complications among children on mechanical ventilator is an urgent need, which will improve the survival rate of mechanically ventilated children. All these factors prompted the researcher to carry out the present study in order to educate staff nurses regarding management of critically ill children on mechanical ventilator.

Objectives of the Study

- i. To assess pre-test knowledge score regarding management of critically ill children on mechanical ventilator among the staff nurses.
- ii. To assess post-test knowledge score regarding management of critically ill children on mechanical ventilator among the staff nurses.
- iii. To compare pre-test and post-test knowledge scores regarding management of critically ill children on mechanical ventilator among the staff nurses.
- iv. To find out association of pre-test knowledge scores among staff nurses regarding the management of critically ill children on mechanical ventilator with their selected demographic variables i.e Age, Professional qualification, Clinical experience in pediatric wards, clinical experience in pediatric ICUs, and Special training related to pediatric critical care.

Research Hypothesis

- H1:** There is significant increase in post-test knowledge scores as compared to pre-test knowledge scores regarding management of critically ill children on mechanical ventilator among the staff nurses at $p \leq 0.05$ level of significance.
- H2:** There is significant association of pre-test knowledge scores regarding management of critically ill children on mechanical ventilator among the staff nurses with their selected demographic variables i.e. Age, Professional qualification, Clinical experience in pediatric wards, Clinical experience in pediatric ICUs, and Special training related to pediatric critical care at $p \leq 0.05$ level of significance.

2. METHODS

Research design: Pre-experimental one group pre-test post-test research design.

Setting: The study was conducted in Government G.B. Pant hospital of Srinagar Kashmir.

Population: All staff nurses working in Govt. G.B.Pant Hospital of Srinagar Kashmir.

Sample size: 50 staff nurses.

Data Collection Tool: Self-Structured Knowledge questionnaire comprised of two sections:

- Section I: Demographic variables on five items i.e. Age, Professional Qualification, Clinical experience in pediatric wards, clinical experience in pediatric ICU's, special training in pediatric critical care.
- Section II: This consists of 50 multiple choice questions and is divided into three parts which includes knowledge assessment related to:
 - I. Introduction, mechanical ventilation, mechanical ventilator (8 items),
 - II. Nursing management of critically ill children on mechanical ventilator (35 items),
 - III. Weaning- off, extubation of intubated child and complications associated with mechanical ventilation (7 items).

Structured Teaching Programme covered Introduction, mechanical ventilation, mechanical ventilator, Nursing management of critically ill children on mechanical ventilator, Weaning- off, extubation of intubated child and complications associated with mechanical ventilation.

Score Interpretation

Each correct response was given a score of (1), and the incorrect or unanswered response was given a score of (0). According to the scores attained the following criterion of interpreting the scores was developed

Table 1

Score	Score Percentage	Knowledge Criteria
0-25	$\leq 50\%$	Poor knowledge.
26- 38	51- 75%	Average knowledge.
39-50	$> 75\%$	Good knowledge.

Reliability of the Tool (Test Re-Test Method)

Reliability of the tool was assessed by administering it to 5% of sample size i.e 3 study subjects. The reliability of the research tool was computed by using test-retest method. The tool was administered to 3 study subjects at two different occasions. Scores of the tool administered at two different occasions were compared and calculated by using the formula of Karl Pearson's correlation co-efficient.

Karl Pearson's Correlation Coefficient

$$r = \frac{\sum_1^n (x_1 - \bar{x})(y_1 - \bar{y})}{\sqrt{\sum_1^n (x_1 - \bar{x})^2 \sum_1^n (y_1 - \bar{y})^2}}$$

Where 'r' is reliability co-efficient.

The reliability of self-structured questionnaire was found to be $r = 0.97$. Hence, the tool was found statistically significant and thus reliable.

Data analysis

Descriptive and inferential statistics were used. Descriptive statistics such as frequency and percentage were used to describe sample characteristics. Mean, S.D, Median, Minimum, Maximum and Range was used to assess the knowledge of study subjects. In Inferential statistics, Paired ‘t’ test was used to compare pre-test & post-test knowledge, and Chi-square test was used to determine the association of pre-test knowledge scores with selected demographic variables.

3.RESULTS

Out of **50** study subjects, in pre test **24(48%)** had poor knowledge, **22 (44%)** had average knowledge, and only **4(8%)** had good knowledge regarding management of critically ill children on mechanical ventilator. In post-test out of 50 study subjects, most of study subjects **29 (58%)** had average knowledge, **16(32%)** had good knowledge and only **5(10%)** had poor knowledge regarding management of critically ill children on mechanical ventilator (Table 2). The mean post-test knowledge score (**35.80 ± 7.632**) was greater than the mean pre-test knowledge score (**26.84±8.348**) with the mean difference of **8.96** at **p <0.001** (Table 3). There was statistically significant association between pre-test knowledge scores of study subjects with their demographic variables i.e. **Professional qualification (p=0.0058)** and **Clinical experience in pediatric ICUs (p=0.00628)**. While as no significant association was found with other demographic variables as Age (p=0.18) and Clinical experience in pediatric wards (p=0.93) at p≤ 0.05 (Table 4).

Table 2: Level of subject knowledge

N=50

Level of Knowledge	Pre-Test		Post-Test	
	Frequency	Percentage	Frequency	Percentage
Poor (<50%); 0-25	24	48%	5	10%
Average (50-75%) ;25-38	22	44%	29	58%
Good (75-100%); 38-50	4	8%	16	32%

Table 3: Pre and post knowledge mean score

N=50

Knowledge	Mean ± Standard deviation	Mean Difference	P-value
Pre-Test	26.84 ±8.348	8.960	< 0.001
Post-Test	35.8±7.632		

Table 4: Association of Pre Test Knowledge Scores of Study Subjects With Their Selected Demographic Variables.

Association Of Pre Test Knowledge Scores Of subjects With Selected Demographic Variables									
Variables	Opts	Good	Average	Poor	Chi Test	P Value	Df	Table Value	Result
Age in years	20-30	2	16	20	6.208	0.184	4	9.488	Not *Sig
	30-40	1	5	4					
	40-50	1	1	0					
	50-60	0	0	0					
Professional Qualification	GNM	2	18	24					

	Basic B.Sc Nsg	1	3	0	18.156	0.005	6	12.592	*Sig
	Post Basic B.sc Nsg	0	1	0					
	M.Sc Nsg	1	0	0					
Clinical Experience In Pediatric Wards	≤5 years	2	16	20	10.824	0.0939	6	12.592	Not *Sig
	5-10 yrs	0	3	4					
	10-15yrs	1	2	0					
	≥ 15 yrs	1	1	0					
Clinical Experience In Pediatric ICU'S	Nil	1	4	19	19.495	0.0006	4	9.488	*Sig
	≤5 years	2	15	5					
	5-10 yrs	1	3	0					
	10-15yrs	0	0	0					
Special Training Related To Pediatric Critical Care	Yes	0	0	0	NA				
	No	4	22	24					

*Sig=Significant; NA=Not Applicable

4. Discussion

The first objective of the study was to assess the pre-interventional knowledge regarding the management of critically ill children on mechanical ventilator among staff nurses. [PRE-TEST] as shown in Table 2. The findings are supported by descriptive study conducted by Fathimath Suhara K.A, Jancy George, Jancy Thomas K, Jasmine Chacko, Jithu Gee varghese, Babu Dharmarajan (2013)¹¹ to assess the knowledge regarding management during mechanical ventilation among the staff nurses (n=50) working at Yenepoya Medical College Hospital, Mangalore Karnataka India. Findings revealed that majority of the study subjects 33(66%) had poor knowledge, 16(32%) subjects had average knowledge and only one subject (2%) had good knowledge regarding mechanical ventilation.

The second objective of the study was to assess the post-interventional knowledge regarding the management of critically ill children on mechanical ventilator among the staff nurses [POST-TEST] as shown in Table 2. The findings are supported by the findings of a pre experimental study conducted by Sunita T, Elizabeth I (2015)¹², to assess effectiveness of teaching programme on the knowledge regarding care of infants on mechanical ventilator among 72 staff nurses at Krishna institute of nursing sciences Karad, Maharashtra India. The findings revealed that in post test most of study subjects 37(51.4%) had average knowledge & 32(44.4%) had good knowledge and only 3(4.2%) had poor knowledge.

The third objective of the study was to compare the pre-test and post-test knowledge scores regarding management of critically ill children on mechanical ventilator among staff nurses as shown in Table 3. The findings are supported by pre experimental study conducted by Sunita T, Elizabeth I (2015)¹² to assess effectiveness of teaching programme on knowledge regarding care of infants on mechanical ventilator among 72 undergraduate student nurses at Krishna institute of nursing sciences, Karad Maharashtra India. The findings revealed that Pre-test mean knowledge score was 12.47 which was increased in post test to 24.05 with a mean difference of 11.58 at $p < 0.05$. This suggests that teaching programme significantly increased the knowledge among nurses. It is also supported by pre-experimental study conducted by Bithika G, Benita DM, Arline B (2015)¹³ to evaluate the effectiveness of teaching programme on airway management modalities among 60 staff nurses in down town hospital, Guwahati Assam. The findings revealed that mean post-test knowledge score (23.70) was significantly higher than mean pre-test knowledge score (17.25). There was significant difference of 6.45 between mean post test and pre-test knowledge scores at $p < 0.05$.

The fourth objective of the study was to find out association of pre-test knowledge scores regarding the management of critically ill children on mechanical ventilator among the staff nurses with their selected demographic variables i.e Age, Professional qualification, Clinical experience in pediatric wards, Clinical experience in ICUs, Special training related to pediatric critical care areas shown in Table 4. The findings are supported by cross sectional study conducted by Dr. Fashafsheh I, Ayed A, Eqtaif F, Harazneh L (2015)¹⁴ to assess the level of knowledge of infection control among 271 nurses in PICU of governmental hospitals of Palestine between November, 2014 and January, 2015. Significant statistical association was found between mean knowledge scores towards Professional qualification ($p=0.012$) at $p < 0.05$. The findings of present study are also supported by quasi experimental study conducted by Dr. Amina IB (2014)¹⁵ to assess effectiveness of educational programme on knowledge of 30 ICU nurses at the Central Quwesna Hospital, Egypt. The study findings revealed that significant association was found between knowledge of study subjects with Professional qualification and ICU experience ($p < 0.05$). The findings of study are also consistent with descriptive cross sectional study conducted by Kose I, Yesil P, Oztunç G, Eskimez Z (2016)¹⁶ to assess knowledge of 73 nurses working in intensive care units regarding prevention of pressure ulcer in intensive care units of a university hospital located in Adana, Turkey. The study findings revealed that no significant association was found between mean knowledge score of study subjects with Age and Years of Experience ($p > 0.05$). The findings of present study are in agreement with descriptive study conducted by Darshan K, Krishnan P, Krishnan RN (2009)¹⁷, to assess the knowledge of staff nurses regarding management during mechanical ventilation and found that there is no significant association ($P > 0.05$) between knowledge scores of staff nurses in relation to their demographic variables i.e Age and Clinical Experience

5. CONCLUSION

The study proved that structured teaching programme was effective in improving the knowledge of study subjects regarding management of critically ill children on mechanical ventilator

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