

Original Research Article

Effectiveness of video assisted teaching on knowledge and practice regarding suctioning of children on mechanical ventilator among nurses working in paediatric department

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ABSTRACT

Background: Airway secretion clearance is a normal process that is essential for preventing respiratory infections, atelectasis, pulmonary haemorrhage and maintaining airway patency. In order to ensure this, effective and safe suction is necessary. Thus, endotracheal suctioning removes secretions which gets accumulated in the endotracheal tube through using negative suction pressure. The study aimed to assess the effectiveness of video assisted teaching on knowledge and practice regarding suctioning of children on mechanical ventilator among nurses working in pediatric department.

Methods: Data were collected with the help of demographic-profile, Self-Structured knowledge questionnaire and Rating scale tool from 38 samples using Purposive sampling technique who met the inclusion criteria. The pretest data collected before intervention and post-test data collected after one week of video assisted teaching.

Results: The result revealed that post intervention knowledge score was found to be more (20.44 ± 2.68) than pre intervention knowledge score (14.31 ± 2.77), $t=9.19$. Post intervention attitude score was found to be more (26.86 ± 3.30) than pre intervention attitude score (18.52 ± 3.68), $t=8.17$ at 0.05 level of significance.

Conclusions: These findings revealed that the video assisted teaching programme on knowledge and practice was effective.

Keywords: Endotracheal suctioning, Knowledge, Nurses, Practice, Video assisted teaching programme

INTRODUCTION

Endotracheal suctioning is an essential procedure in patients undergoing mechanical ventilation with intubation to keeping the airways open through removal of accumulated pulmonary secretions.¹

Nurses in intensive care units practice endotracheal suctioning to remove lung secretions, which is a required operation. This therapy results in higher oxygenation levels and fewer breathing issues. It also protects against

atelectasis, lung infections, and secretory buildup.² Ventilator-associated pneumonia is a significant cause of mortality and morbidity among patients after endotracheal intubation. This is owing to health workers' inappropriate suctioning procedures.³ The last few year the prognosis, of ventilated new-borns has improved to a better extent.⁴ Pneumonia killed 808694 children under the age of five in 2017, accounting for 15% of all deaths in children under the age of five.⁵ Due to some type of respiratory insufficiency, such as a problem in the normal function of ciliary cells, a malfunction in the coughing

reflex, and other factors, critically ill children frequently produce more mucus and have a reduced ability to remove secretions. The patient may be at danger of chest infection, hypoxemia, atelectasis, and cardiovascular instability if secretions are not removed effectively. To address such severely ill patients, endotracheal intubation and the establishment of mechanical ventilation have been frequently used.⁶

Endotracheal suctioning (ETS) is one of the top ten essential nursing cares delivered by critical care nurses to intubated patients. ETS is a type of bronchial hygiene therapy for mechanically ventilated patients in which a suction catheter is introduced into the trachea via an endotracheal tube and bronchial secretions are cleared by applying negative pressure to the lungs. It prevents excessive secretion from accumulating in the lungs, maintaining airway patency, ensuring adequate oxygenation, and saving the patients' lives.⁷⁻⁹

Endotracheal suction (ETS) is a common invasive procedure which aims at keeping airways of the patient with endotracheal tube patent by mechanically removing accumulated pulmonary secretions.¹⁰⁻¹²

Objectives of the study were to assess the effectiveness of video assisted teaching program on knowledge and practice regarding suctioning of children on mechanical ventilator among nurses working in pediatric department and to find out the significant difference between pretest and post test score regarding knowledge and practice regarding suctioning of children on mechanical ventilator among nurses working in pediatric departments.

METHODS

In this study quantitative approach was adopted with quasi-experimental (one group pretest-posttest) research design. Data were collected with the help of demographic-profile, self-structured questionnaire and

rating scale tool from 38 samples using Purposive Sampling Technique, who met the inclusion criteria. Inclusion criteria were staff nurses who possess degree or diploma in nursing, willing to participate in study and who were present at the time of data collection. Exclusion criteria were staff who was not willing to give consent/participation and staff who were absent during data collection. Ethical clearance was obtained from Institutional ethical committee King George's Medical University Lucknow, U.P. (ECR/262/Inst/UP/2013/RR-19) and the period of data collection was from May 2021 to June 2021. Study related information was explained to participants and informed consent was obtained from the participants. The demographic data were collected using a performa prepared by investigator. Assessed the knowledge and practice of nurses regarding suctioning using a self-structured questionnaire and rating scale respectively. After assessment of previous knowledge and practice of nurses, teaching is provided through video assisted teaching. After a span of one weeks of video assisted teaching intervention, re-assessed the knowledge and practice of nurses using a self-structured questionnaire and rating scale respectively. Reliability of self-structured questionnaire was computed by Karl Pearson correlation coefficient formula. Reliability of self-structured questionnaire was 0.97. Reliability of rating scale was computed by using Cronbach's Alpha method based on the pilot study data. Reliability of the rating scale was 0.82. All data computed manually using MS Excel.

RESULTS

The result revealed that most of the participants were in the age group of 20-30 years. All participants of the study were female. Majority of the participants were having GNM qualification. Most of the participants were having experience of 3 or more than 3 years. Maximum participants had worked in paediatric medicine. All participants were having previous exposure to suctioning.

Table 1: Comparison between pre-interventional and post-interventional knowledge score.

Knowledge	Mean	Mean difference	Mean percentage	S.D.	t-value
Pre-intervention	14.31		41.17	2.77	
Post-intervention	20.44	8.36	58.82	2.68	9.19

Table 2: Categorical comparison between pre and post- test knowledge score (n=38).

Score	Category	Pre-test		Post- test	
		f	%	f	%
0-7	Poor	0	0	0	0
8-13	Average	15	39.47	1	2.63
14-19	Good	22	57.89	12	31.57
20-25	Excellent	1	2.63	25	65.78

This Table depicts that pretest knowledge score showed that majority 22(57.89%) of nurses had good knowledge i.e. between 14-19, nurses with average knowledge were

15 (39.47%) ranging from 08-13, only 1 (2.63%) nurse had excellent knowledge ranging from 20-25 and no one had poor knowledge from (0-7). Post-test knowledge

score showed that most of the nurses had excellent knowledge 25 (68.78%) ranging from 20-25, nurses with good knowledge were 12 (31.57%) ranging from 14-19,

only one nurse had average knowledge 1 (2.63%) ranging from 08-13, and no one had poor knowledge.

Table 3: Comparison between pre-interventional and post-interventional practice score.

Knowledge	Mean	Mean difference	Mean percentage (%)	S.D.	t-value
Pre-intervention	18.52		40.78	3.68	
Post-intervention	26.86	8.34	59.21	3.30	8.17

Designation: * $t(37)2.02, p<0.05$

Table 4: Categorical comparison between pre and post- test practice score.

Score	Category	Pre-test		Post- test	
		f	%	f	%
0-10	Poor	0	0	0	0
11-20	Average	26	68.42	1	2.63
21-30	Good	11	28.94	33	86.84
31-40	Excellent	1	2.63	4	10.52

Data presented in the table shows that mean post-interventional test score 26.86 (59.21%) is apparently higher than mean pre-interventional test score 18.52 (40.78%). The mean difference between pre-interventional practice score and post-interventional practice score was 8.34. The computed 't' value $t(37) 8.17, p<0.05$ shows that there was a significant difference between pre-test score and post-test score. This indicates that selected teaching module was effective to increase practice of nurses.

This Table shows that before intervention majority i.e. 26(68.42%) of nurses had average practice i.e. between 11-20, nurses with good practice were 11 (28.94%) ranging from 21-30, only 1 (2.63%) nurse had excellent practice ranging from 31-40 and no one had poor practice ranging from 0-10. And after intervention most of the nurses had good practice 33 (86.84%) ranging from 21-30, nurses with excellent practice were 4 (10.52%) ranging from 31-40, only one nurse had average practice 1 (2.63%) ranging from 11-20, and no one had poor practice ranging from 0-10.

DISCUSSION

The result of present study revealed that post intervention knowledge score was found to be more (20.44 ± 2.68) than pre intervention knowledge score (14.31 ± 2.77), $t=9.19$. Post intervention attitude score was found to be more (26.86 ± 3.30) than pre intervention attitude score (18.52 ± 3.68), $t=8.17$ at 0.05 level of significance. Mazeed HM conducted a cross sectional study on knowledge and practices of intensive care unit nurses about endotracheal suctioning for adult patients in Baghdad teaching hospital, Iraq.¹⁹ Total coverage sample of 50 nurses worked in ICU, the data was collected through well-constructed questionnaire, which consists of two parts, and the checklist consist of 3 sections of 35

items. The study's findings showed that implementing an education programme for ICU nurses was successful, and that nurses' knowledge of endotracheal suction had improved in phase II. With extremely significant results ($P\text{-value}=0.000$), the percentage of nurses with strong knowledge increased from 30% in phase I to 68 percent in phase II.¹³ This study supported the findings of present study. The result of present study revealed that post intervention knowledge score was found to be more (20.44 ± 2.68) than pre intervention knowledge score (14.31 ± 2.77), $t=9.19$. Post intervention attitude score was found to be more (26.86 ± 3.30) than pre intervention attitude score (18.52 ± 3.68), $t=8.17$ at 0.05 level of significance.

S Khanjari et al conducted a quasi-experimental study effect of training on the performance of nurses in the endotracheal suctioning of neonates.¹² Endotracheal tube suctioning errors can result in bleeding, tracheal mucosa lesions, infection, atelectasis, hypoxia, and other complications such as higher mortality, longer hospital stays, and higher treatment expenditures. A quasi-experimental study was conducted using a control group of 80 nurses drawn from several Tehran hospitals using a continuous sampling procedure. The performance score of nurses in the intervention group was significantly different before (51.38 ± 8.70) and after (72.19 ± 4.16) the intervention ($P=0.001$). This study shows that the performance score of nurses regarding the intravenous endotracheal intubation in newborns improved after the educational intervention.¹⁴ This study supported the findings of present study.

Limitation

Study was conducted in a single setting on a small sample size. The intervention, assessment, implementations and evaluation were done by the same person.

CONCLUSION

From the findings of the study, it has been observed that video assisted teaching on knowledge and practice regarding suctioning is far better and helpful in increasing the depleting knowledge and practice of nurses regarding suctioning which will lead to provide optimum care and better health facility to ailing patients.

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REFERENCES

1. Liu XW, Jin Y, Ma T, Qu B, Liu Z. Differential effects of endotracheal suctioning on gas exchanges in patients with acute respiratory failure under pressure-controlled and volume-controlled ventilation. *Bio Med research international*. 2015;2015:941081.
2. Dastdadeh R, Ebadi A, Azimi A. Interventional spine and pain procedures in patients on antiplatelet and anticoagulant medications. *Anesth Pain Med*. 2016;6(5):e38337.
3. Pinto HJ, D'silva F, Sanil TS. Knowledge and practices of endotracheal suctioning amongst nursing professionals: a systematic review. *Indian J Critical Care Med*. 2020;24(1):23-32.
4. Pursley DM, Cloherty JP. Identifying the high risk newborn: survival of premature infants. In Cloherty JP, Stark AR, eds. *Manual of Neonatal Care*. Philadelphia, Lippincott Raven. 1998;43-51.
5. World Health Organization. Pneumonia. 2 August 2019. Available at <https://www.who.int/news-room/fact>. Accessed on 12 January 2023.
6. American association for respiratory care. Clinical practice guidelines. Suctioning of mechanically ventilated patients with artificial airways. *Respiratory Care*. 2010;55.6(2010):758-64.
7. Celik SS, Elbas NO. The standard of suction for patients undergoing endotracheal intubation. *Intensive Critical Care Nursing*. 2000;16(3):191-8.
8. Elbokhary R. Knowledge and practice of ICU nurses regarding endotracheal suctioning for mechanically ventilated patients in Khartoum Teaching Hospital. *Am J Clin Neurol Neurosurg*. 2015;2:92-8.
9. Frota OP. Open system endotracheal suctioning: practices of intensive care nursing professionals. *Am J Clin Neurol Neurosurg*. 2015;2:92-8.
10. Spears N, Cook N, Garcia K. Instillation of normal saline in endotracheal suctioning. *Pharm Nurs*. 2017;7:76-9.
11. Jansson M, Ala-Kokko T, Ylipalosaari P, Kyngäs H. Evaluation of endotracheal-suctioning practices of critical-care nurses—An observational correlation study. *J Nurs Educ Pract*. 2013;3(7):99-105.
12. Favretto DO, Silveira RC, Canini SR, Garbin LM, Martins FT DM. Endotracheal Suction in Intubated Critically Ill Adult Patients Undergoing Mechanical Ventilation: a Systematic Review. *Rev Lat Am Enferm*. 2012;20(5):997-1007.
13. Majeed HM. Assessment of knowledge and practices of intensive care unit nurses about endotracheal suctioning for adult patients in Baghdad teaching hospitals, Iraq. *Int J Res Med Sci*. 2017;5:1396-404.
14. Khanjari S, Bayati N, Haghani H. Effect of Training on the Performance of Nurses in the Endotracheal Suctioning of Neonates. *IJN*. 2019;32(118):43-53.

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