

## Effectiveness of Demonstration Regarding Endotracheal Suctioning Among Staff Nurses Working in Selected Hospital

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### Abstract

**Introduction:** Endotracheal suctioning (ETS) is one of the most common procedures performed in patients with artificial airways. It is a component of bronchial hygiene therapy and mechanical ventilation that involves the mechanical aspiration of pulmonary secretions from a patient's artificial airway to prevent its obstruction. The procedure includes patient preparation, the suctioning event, post procedure care. The objectives of the study were to (1) To observe the existing practice regarding endotracheal suctioning among staff nurses. (2) To evaluate practice regarding endotracheal suctioning among staff nurses after demonstration. (3) To find out association of practice with their selected demographic variables.

**Method:** One group pretest and post-test pre-experimental study design by using structured observation checklist to assess practice of endotracheal suctioning among staff nurses. The study was conducted among 30 staff nurses working in ICU of selected hospital by using non probability convenient sampling technique. The data was collected and analyzed based on objectives of the study using descriptive and inferential statistics.

**Result:** The overall comparison of pre-test practice score and post-test practice score of staff nurses regarding endotracheal suctioning mean of pre-test practice score was 7.57 and post-test practice score was 12.17. The tabulated 't' value was 1.69 and the calculated 't' value was 13.73 are much higher than the tabulated value at  $p < 0.05$  level of significance for overall practice score of subjects which was statistically acceptable level of significance. Hence it was statistically interpreted that the demonstration was an effective tool in improving the practice regarding endotracheal suctioning among subjects.

**Conclusion:** The investigator concludes that the demonstration was effective and will help to improve the practice of staff nurses.

**Keywords:** Effectiveness; Demonstration; Endotracheal Suctioning and Staff Nurses

### Introduction

#### *Surgery for Nurse*

Our body needs a constant supply of oxygen to support metabolism. The respiratory system brings oxygen through the airways of lungs into the alveoli, where it diffuses into the blood for transport to the tissues. This process is so vital that difficulty in breathing is experienced as a threat to life itself. Oxygenation is one of the basic human needs.

Endotracheal suctioning (ETS) is one of the most common procedures performed in patients with artificial airways. It is a component of bronchial

hygiene therapy and mechanical ventilation that involves the mechanical aspiration of pulmonary secretions from a patient's artificial airway to prevent its obstruction. The procedure includes patient preparation, the suctioning event, post procedure care. Because micro aspiration of secretions is a risk factor for Ventilator Associated Pneumonia (VAP), assessment of practices related to oral suctioning, oral care, and management of endotracheal tube is important.

The primary objective of mechanical ventilation are to decrease their work of breathing, relieve respiratory distress, rest the fatigued respiratory muscles, improve ventilation, stabilize the chest wall, and restore the acid-base balance. Therefore,

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the most common reasons for instituting mechanical ventilation are acute respiratory failure with hypoxemia (acute respiratory distress syndrome, heart failure with pulmonary edema, pneumonia, sepsis, and complications of surgery and trauma), which accounts for 65% of all ventilated cases, followed by the causes of hypercarbic ventilator failure such as coma (15%), exacerbations of chronic obstructive pulmonary disease (13%), and neuromuscular diseases (5%).

### *Need for the Study*

Studies done by Day *et al.* and Pedersen *et al.* provided data on when and how to perform endotracheal suctioning reflecting that some patients may receive several times of endotracheal suctioning daily according to patient's need. In 2010 the American Association of Respiratory Care (AARC) published the AARC Clinical Practice Guidelines on endotracheal suctioning of mechanically ventilated patients with artificial airway as endotracheal suctioning is done if needed only; providing hyper oxygenation before, during and after endotracheal suctioning; endotracheal suctioning should be done without disconnection between patient and ventilator; avoiding routine normal saline instillation before endotracheal suctioning; use closed suction system for adults with high  $\text{FiO}_2$ , or PEEP; Suction tube diameter is less than 50% the lumen of the endotracheal tube in adults, maximum suction duration is from 10 to 15 seconds. Failure to meet the guidelines in implementation of this procedure can result in numerous side effects. A few studies examined if guidelines for endotracheal suctioning were tracked by nurses in intensive care unit. The results demonstrated that nurses were often not alert of these guidelines. Moreover, they found that there was a considerable difference reflected in nurses' performance between ideal standard endotracheal suctioning where nurses followed the recommended guidelines and actual routine technique when nurses didn't. Additionally, Day *et al.* and Sole *et al.* stated that practice of endotracheal suctioning was not always based on current research recommendations, which may lead to inconsistent practice among nurses, affecting patients' experience and increasing health risks associated with endotracheal suctioning. So, it is necessary to examine the actual routine method of endotracheal suctioning practiced by nurses in intensive care unit and its effect on patient's condition in comparison with the standard endotracheal suctioning that follows evidenced based recommendation.

Knowledge and experience can determine a nurse's ability to adequately perform endotracheal tube suctioning. All nurses who perform suction must receive approved training and demonstrate competencies under supervision. They should ensure that their knowledge and skills are maintained. Nurses should also make sure that they undertake role in accordance with their original protocols, policies and guidelines. But many researchers have identified that nurses are unaware of the current suctioning recommendations and practice is often based on ritual and tradition as opposed to empirical evidence. Hence the investigator has taken up the study to evaluate the effectiveness of endotracheal suctioning practice among nursing personnel.

### *Problem Statement*

Effectiveness of demonstration regarding endotracheal suctioning among staff nurses working in selected hospital

### *Objectives*

- (1) To observe the existing practice regarding endotracheal suctioning among staff nurses.
- (2) To evaluate practice regarding endotracheal suctioning among staff nurses after demonstration.
- (3) To find out association of practice with their selected demographic variables.

### *Hypothesis*

**H<sub>0</sub>:** There is no significant difference in pre-test and post-test practice regarding endotracheal suctioning among staff nurses after demonstration measured at  $p < 0.05$  level of significance.

**H<sub>1</sub>:** There is a significant difference in the pre-test and post-test practice regarding endotracheal suctioning among staff nurses after demonstration measured at  $p < 0.05$  level of significance.

### *Conceptual Framework*

Conceptual Framework Based on Modified King's Goal Attainment Theory.

### *Review of Literature*

Literature review is a critical summary of research on a topic of interest generally prepared

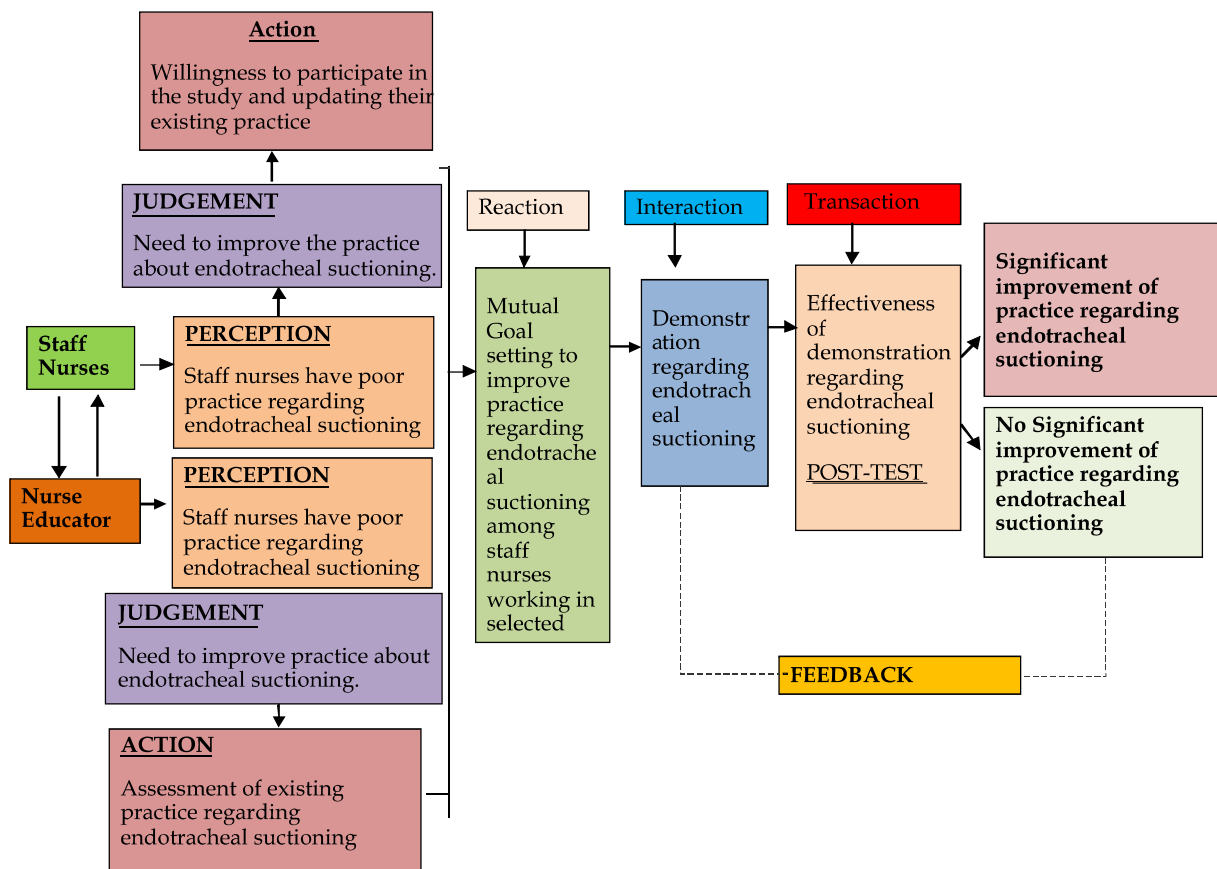


Fig. 1:

to put a research problem in context or to identify gaps and weakness in prior studies so as to justify a new investigation.

Studies reviewed have been arranged under the headings as

1. Review of Literature related to endotracheal suctioning.
2. Review of Literature related to effectiveness of demonstration regarding endotracheal suctioning

### Materials and Methods

In this study effectiveness of demonstration regarding endotracheal suctioning among staff nurses working in selected hospital was studied by using structured observation checklist to assess practice of endotracheal suctioning. The research design used in the study was one group pretest and post-test pre-experimental design. The study was conducted among 30 staff nurses working in

ICU of selected hospital by using non probability convenient sampling technique.

### Inclusion Criteria

The study will include

1. Staff nurses working in the intensive care unit.
2. Staff nurses who are willing to participate in the study.

### Exclusion Criteria

Nurses who have attended training programme on endotracheal suctioning.

### Development of the Tool

The investigator used the procedure of endotracheal suctioning from National Accredited Board for Hospitals (NABH) guidelines and steps were used in the checklist. Structured observation checklist consists of two sections:

*Part 1:* Consists of demographic variables of study subjects such as age, professional qualification and years of experience.

*Part 2:* Structured observation checklist

### Scoring Technique

#### Practice Score

Poor Practice	< 50%
Fair Practice	50%–75%
Good Practice	Above 75%

## Results

### Section-A

Distribution of subjects with regards to their demographic variables

Table 1 shows that the distribution of subjects according to their demographic variables.

Regarding age, 18 (60%) subjects were between age group of 21–30 years, 12 (40%) subjects age group between 31–40 years. In relation to their professional qualification out of 30 subjects 12 (40%) subjects had done GNM, 12 (40%) subjects had done Basic B.Sc. nursing and 6 (20%) subjects had done Post B.Sc. nursing. In relation to their years of experience out of 30 subjects 17 (56.67%) subject had 0–5 years of experience, 9 (30%) subjects had 6–10 years of experience and 4 (13.33%) subject had 11–15 years of experience.

### Section B

Distribution of subjects in relation to their existing practice regarding endotracheal suctioning

Table 2 reveals information about existing practice regarding endotracheal suctioning before demonstration. In that 14 (46.67%) subjects had poor practice and 16 (53.33%) subjects had fair practice.

Frequency and percentage Distribution of subjects in relation to their practice regarding

**Table 1:** Frequency and percentage distribution of subjects with regards to their demographic variables.

(n = 30)

Demographic Variables	Frequency	Percentage %
Age		
21–30 years	18	60
31–40 years	12	40
41–50 years	0	0
>51 years	0	0
Professional Qualification		
Diploma in General Nursing and Midwifery	12	40
Basic B.Sc. Nursing	12	40
Post Basic B.Sc. Nursing	6	20
M.Sc. Nursing	0	0
Year of experience		
0 – 5 years	17	56.67
6 – 10 years	9	30
11 – 15 years	4	13.33
16 – 20 years	0	0

**Table 2:** Frequency and percentage distribution of subjects in relation to their existing practice regarding endotracheal suctioning

(n = 30)

Sr. No	Level of Practice	Poor		Fair		Good	
		Frequency	%	Frequency	%	Frequency	%
1	Pre-test	14	46.67	16	53.33%	0	0

**Table 3:** Shows information about existing practice regarding endotracheal suctioning after demonstration

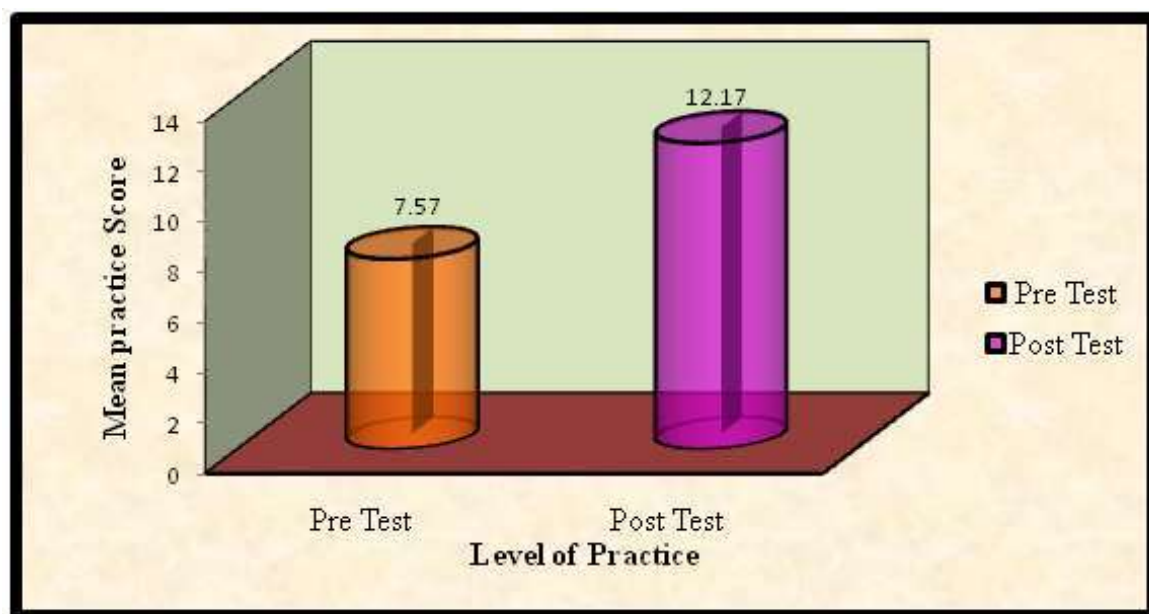
(n = 30)

Sr. No	Level of Practice	Poor		Fair		Good	
		Frequency	%	Frequency	%	Frequency	%
1	Post-test	0	0	20	66.67%	10	33.33%

**Table 4:** Shows the mean, standard deviation and mean difference values are compared and student's paired 't' test

(n = 30)

Sr. No	Overall	Mean	SD	Mean Difference	t-value	p-value
1.	Pre Test	7.57	1.45	4.6	13.73(S)	p<0.05
2	Post Test	12.17	1.21			



**Fig. 1:** Shows the mean, standard deviation and mean difference values are compared and student's paired 't' test

endotracheal suctioning after demonstration

Table 3 shows information about existing practice regarding endotracheal suctioning after demonstration. In that 20 (66.67%) subjects had fair practice and 10 (33.33%) subjects had good practice.

*Section C*

Significance of difference between practice score in pre and post-test of subjects

Table 4 shows the mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at p<0.05 level of significance. The tabulated value for df (n-1) was 1.69. The calculated 't' value was 13.73 are much higher than

the tabulated value at p < 0.05 level of significance for overall practice score of subjects which was statistically acceptable level of significance. Hence it was statistically interpreted that the demonstration was an effective tool in improving the practice regarding endotracheal suctioning among subjects was effective. Thus the H<sub>1</sub> was accepted.

*Section D*

Association of existing level of practice score in relation to demographic variables

It was interpreted that demographic variables is statistically not associated with their practice score regarding endotracheal suctioning.

## Discussion

The finding of the study was discussed with reference to the objective stated as below. The present study was undertaken as, "Effectiveness of demonstration regarding endotracheal suctioning among staff nurses working in selected hospital."

- To observe the existing practice regarding endotracheal suctioning among staff nurses.
- To evaluate practice regarding endotracheal suctioning among staff nurses after demonstration.
- To find out association of practice with their selected demographic variables.

A cross sectional descriptive study was conducted on the gap between knowledge and practices in standard endotracheal suctioning of intensive care unit (ICU) nurses in children's hospital Lahore in 2017 with an aim to assess the gap between knowledge and practice in standard endotracheal suctioning of intensive care unit nurses. The data collected from 118 nurses in the 11 ICU's of children hospital by using questionnaire and checklist. The findings showed that 42.9% had good level of practice, 44.5% had fair level of practice, and 14% had poor level of practice. The mean knowledge score of the nurses calculated to be  $24 \pm 3.0$  (min-max = 10-31) and the mean practice score was  $17.85 \pm 5.67$ . There is no relationship between knowledge and practice score. The study concluded that there is a need for training in this skill and continue feedback until desire level of skill achieved.

With regard to first objective of the study, the study result showed that among all subjects, in pre-test score 46.67% poor practice level and 53.33% had fair practice level. Mean practice score of pre-test was  $7.57 \pm 1.45$  whereas in post-test score 66.67% had fair practice level and 33.33% had good practice level. Mean practice score of post-test was  $12.17 \pm 1.21$ . The study revealed that the level of practice regarding endotracheal suctioning among the subject in pre-test was poor and after the demonstration the mean post-test score improved.

A pre-experimental study was conducted on effectiveness of planned teaching programme on the knowledge of endotracheal suctioning among staff nurses working in intensive care unit at Mathuradas Mathur hospital in Jodhpur, Rajasthan in 2015 with an aim to assess the effectiveness of planned teaching programme on the knowledge regarding endotracheal suctioning among staff nurses working in intensive care unit. The data

was collected from 26 staff nurses by using a structured knowledge questionnaire. The finding showed that the mean pre-test knowledge score (17.07) of the staff nurses have average knowledge regarding endotracheal suctioning. The mean post-test knowledge score (25.30) was higher than the pre-test score. The 't' test computed for knowledge 't' (25) = 8.1154,  $P \leq 0.001$  showed highly significant difference suggesting that a planned teaching programme is effective teaching strategy to increase their knowledge and improve their practices.

With regards to second objective of the study result showed that in pre-test mean score was 7.57 and standard deviation was 1.45. Post-test mean score was 12.17 and standard deviation was 1.21. Calculated 't' value was 13.73 at  $p < 0.05$  level of significance which was much higher than the tabulated value was 1.69 at  $p < 0.05$  level of significance for overall practice score of staff nurses which was statistically acceptable level of significance. Hence it was statistically interpreted that the demonstration on overall practice regarding endotracheal suctioning among subjects was effective. Thus the  $H_1$  was accepted.

With regards to third objective of study result showed that the association of existing level of practice score with age in years reveals that the tabulated chi-square value was 3.84 (df = 1) which was much higher than the calculated value was 1.32 at 0.05 level of significance. The association between practice score with their years of experience reveals that tabulated chi-square value was 5.99 (df = 2) which was much higher than the calculated value was 1.17 at  $p < 0.05$  level of significance. There was no association between practice score with their demographic variables.

## Conclusion

After the detailed analysis, this study leads to the following conclusion:

There was a significant increase in the level of practice among subjects after the demonstration. To find the effectiveness of demonstration 't' test was applied and 't' value was calculated, the mean post test score were significantly higher than their mean pre-test score as evidenced from demonstration which was measured that  $p < 0.05$  level of significance. Thus it was concluded that demonstration was found to be effective teaching strategy.

Demographic variables did not show a major role in influencing the pre-test and post-test practice

score among staff nurses.

Hence, based on the above cited findings, it was concluded undoubtedly that the demonstration was effective regarding endotracheal suctioning.

#### *Limitation*

- This study was limited to the staff nurses working in intensive care unit in selected hospital.
- The study was limited to intubated patients.

#### *Implications of the Study*

The investigator has drawn the following implications from the studies which were of vital concern to the field of nursing education, nursing service, nursing administration and nursing research.

#### *Nursing Practice*

- The present study implies demonstration to be an effective strategy to improve the practice regarding endotracheal suctioning.
- The findings of the present study emphasis on demonstration regarding endotracheal suctioning which can be put into nursing practice to enhance the practice of staff nurses regarding endotracheal suctioning and to provide appropriate nursing care to the clients. Demonstration can be used as a basis for educating the staff.

#### *Nursing Education*

- Nursing may be defined as a dynamic, therapeutic and educative process in meeting health needs of the society.
- The present study emphasizes on demonstration regarding endotracheal suctioning among staff nurses. In order to educate the staff nurses, it is essential that the nurses have to be competent and have sound knowledge to improve the level of understanding which can be reflected to the public through education.

#### *Nursing Administration*

Nursing administration plays a pivotal role in supervision and management of nursing profession. The nurse administrators can utilize the present tool for assessing the practice of nurses and can implement measures to promote health on the finding of the study. Teaching modules, group discussions and periodical educational sessions can

also be arranged for subjects.

#### *Nursing Research*

Research is a systematic attempt to obtain meaningful answers to phenomenon or events through the application of scientific procedures. It is an objective, impartial, empirical and logical analysis according to controlled observations that may lead to the development of generalizations, principles or theories resulting to some extent in prediction and control of events that may be the consequences or cause of specific phenomenon.

The finding of the study would add to the existing body of knowledge in the nursing profession. It would also provide a baseline data to educate staff and student nurses regarding endotracheal suctioning.

#### *Personal Experience*

The entire study gave an enriching experience to the investigator. It helped to develop her skill in critical thinking, analysis and realize the importance of effective communication with respondents. The entire study was varied and rich learning experience which enabled the investigator to develop her skill in dealing with different personalities. The concept clarity about research as a whole increased. At every stage, the investigator received guidance and support from her guide. This boosted confidence to go ahead and carry out the planned activities and the co-operation from study subject was remarkable. The research was a great learning opportunity for the investigator.

#### *Recommendations*

- On the basis of the findings of the study, it is recommended that the following studies can be conducted.
- Similar studies may be conducted on a larger population for generalization of findings.
- Studies may be conducted to evaluate the effectiveness of video assisted teaching on practice regarding endotracheal suctioning.
- A similar study can be conducted and evaluated using alternative teaching strategies like interactive learning sessions, structured teaching programme.
- Experimental studies can be conducted with recommendation.
- A study can be conducted to assess the knowledge regarding endotracheal suctioning.

- A study may be conducted to assess the existing knowledge and practice regarding endotracheal suctioning.

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