



A COMPARATIVE STUDY BETWEEN OPEN AND CLOSE SUCTIONING METHOD FOR THE PREVENTION OF VENTILATED ASSOCIATED RESPIRATORY INFECTION

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ABSTRACT **BACKGROUND :** Suctioning , is a process by which liquids,gases or other substances are drawn out from respiratory organ. Despite being it is a necessary procedure, it can lead to some complications .now a days it's a debatable issues between open and close suctioning methods for prevention of VARI among patient on ventilator.
METHOD :Quasi-experimental approach was used with single only post test control group design. 50 patients were selected using purposive sampling technique and randomly assigned in to two groups. check list was used for data collection.
RESULT :there is significant difference in suctioning method regarding prevention of VARI score at 0.05 level of significance unPaired 't' test value in that the mean of close suction group score 5.8 is lower than mean of open suction group score 8.12.
CONCLUSION:The current study suggests that close suctioning method is more effective in prevention of VARI as compare to open suctioning method.

KEYWORDS : open suction ,close suction,ventilator associated respiratory infection(VARI)

INTRODUCTION :

suction is a procedure which aims to keep airway patent by mechanically removing accumulated pulmonary secretions, above all in patients with artificial airways. Despite being a necessary procedure, it can lead to complications, such as lesion in the tracheal mucosa, pain, discomfort, infection, alterations of the hemodynamic parameters ,increases in intra-cranial pressure, and alteration in cerebral blood flow, among others. Considering this procedure's complexity, a prior evaluation of the need for suction is indispensable, as this is an invasive, complex procedure that must be undertaken by judicious indication, as it can cause harm to the patient. For this procedure, it is important that the nurse has knowledge based on valid scientific evidence concerning the different methods of suction and aspects related to it.

Two suction systems are available on the market: an open suction system (OSS) clearing the airway of a mechanically ventilated patient with a suction catheter inserted into the endotracheal tube after the patient has been disconnected from the ventilator circuit. and a closed suction system (CSS). The OSS is only used once and requires that the ventilator be disconnected. closed (in-line) suction system. The closed method of suctioning involves a multi-use catheter enclosed in a plastic sheath. It is most often used with patients who are mechanically ventilated and have an endotracheal or tracheotomy tube in place. Where as the CSS use is multiple and permits suction without disconnection. It is positioned between the tracheal tube and the mechanical ventilator circuit and cannot remain in the patient for more than 24 hours.

Clearance of airway secretion is a normal physiological process needed for the preservation of airway patency and the prevention of respiratory infection. Impaired clearance of airway secretions can result in atelectasis and pneumonia and may contribute to respiratory failure. Intubated patient intensive care units (ICU) deal with many problems in adequately coughing up secretions consequently result in the obstruction of tube lumen, increased respiratory work, pulmonary infections, alteration of the heart rate, hypoxemia, and ventilator associated pneumonia (VAP) to reduce these complications, endotracheal suctioning (ES) technique is a common procedure that is performed times a day on the patients in ICU. By removing the pulmonary secretions, ES can help to establish and maintain gas exchange, adequate oxygenation, and alveolar ventilation.⁷

OBJECTIVE OF STUDY:

- 1) To measure occurrence of ventilator-associated respiratory infections among patients undergoing close suctioning, type of suction.
- 2) To measure occurrence of ventilator-associated respiratory infections among patients undergoing open suctioning, type of suction.

- 3) To compare observation of open suction and close suction in terms of occurrence of ventilator-associated respiratory infections.
- 4) To determine the association between ventilator-associated respiratory infections and demographic variables of selected patients.

HYPOTHESIS:

H₀ - There will no significant relationship between ventilator-associated respiratory infections and types of suctioning method score at 0.05 level of significance.

CONCEPTUAL FRAMEWORK :

BASED ON GENERAL SYSTEM THEORY BY LUDWIG VON BERTANLANFFY (1968)

RESEARCH METHODOLOGY :

Research Approach: Quantitative research approach
Research Design: Observational comparative research design
Research Variable: open and close suction system.

DEMOGRAPHIC VARIABLES:

Socio-demographic variables age, gender, Family income, Types of suctioning ,total number of days in hospital, Number of days on ventilator, Frequency of suctioning, Mode of mechanical ventilator.

RESEARCH SETTINGS

selected hospitals of central Gujarat.

POPULATION

Patients on ventilator.

SAMPLE

patients on ventilator who fulfill inclusion criteria.

SAMPLE SIZE

50 patients who are on ventilator

SAMPLING TECHNIQUE

Non probability purposive sampling technique is used.

Data collection Tool: check list

VALIDITY:

CONTENT VALIDITY :

The tool was established by four experts in the field of Medical Surgical Nursing.

RELIABILITY:

The reliability of the tool is tested by Method using Cronbach's alpha or coefficient alpha formula. The reliability computed was **r=0.88**

PILOT STUDY:

Pilot study was conducted on 23rd March to 8th April 2018 at Apra Hospital, Anand and CHRF Hospital Changa. The sample size of Hospital pilot study was 10. An administrative approval was obtained from Apra Hospital and CHRF hospital. On the day of data collection the purpose of the study was explained and informed consent taken from relative of patient who are on ventilator and fulfilled the sample criteria. Samples were selected based on non-probability purposive sampling technique. In this 10 patients were selected in that 5 patients were assign for open suction and 5 assign for close suction. A data was collected by Observational check list. The pilot study showed that the setting, samples and tool was feasible enough to conduct the main study. No further changes made in tool after the study.

RESULTS :

The data obtained were entered into a master sheet for tabulation, analysis and interpretation, using descriptive and inferential statistics. The data collected are presented under the following headings.

SECTION 1: Findings related to socio-demographic variables.

OPEN AND CLOSE SUCTIONING

With regard to age reveals that most of the subjects 9 (36%) were include from 41-45 years of age in open suction and 9 (36%) were include from 41-45 years of age in close suction method. With regard to Gender 14(56%) belong to Male, 11(44%) belongs to female in open suctioning method. In close suctioning method 15(60%) belongs to male, 10 (40%) belongs to female. With regard to Family Income Per month 8(32%) were in 5001-10,000, in to open suctioning Method 8(32%) were belongs in 10001 to 20,000 in close suctioning Method.

Table 4.1: Comparison Of Ventilator Associated Respiratory Infection Rate In Open And Closed Suction Group.

	Mild infection		Moderate infection		Severe infection	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Closed Suction	6	24%	19	76%	0	0%
Open Suction	0	0	22	88%	3	12%

N=50

that with closed suction majority of the participants 19 (76%) were having moderate infection, only 6 (24%) were having mild infection and none of the participants were having severe infection. Where as with open suction majority of the participants 22 (88%) were having moderate infection, and 3 (12%) of the participants were having severe infection.

Table 4.2 Comparison Between Open Suction And Closed Suction In Occurrence Of Ventilator Associated Respiratory Infection

N = 50

	Mean	Mean difference	SD	Df	Unpaired 't' value	p value
Closed suction	5.8	2.32	1.78	48	4.38	<0.05
Open suction	8.12		1.96			

that mean infection rate (5.8) with closed suction was lesser than the mean infection rate (8.12) with open suction, with the mean difference of was (2.32). Independent t test calculated value is 4.38 *p<0.05 is significant at 0.05% level.

The independent t test value was computed to determine and compare the effect of open suction and closed suction in occurrence of ventilator associated respiratory infection. The following research hypothesis was tested.

H0 –There is no significant difference in suctioning method regarding occurrence of ventilator-associated respiratory infections score at 0.05 level of significance.

Hence null hypothesis H0 was rejected. This indicates that there is significant difference in suctioning method regarding occurrence of ventilator-associated respiratory infections score at 0.05 level of significance.

SECTION 5: Findings related to measure occurrence association between ventilator-associated respiratory infections and demographic variables of selected patients.

that the calculated chi square value was less than the chi square tabulated value at 0.05 level of significance for all the selected

With regard to Total number of days of Hospital admission 11 (44%) belongs to 7-10 days. 5(20%) belongs to open suctioning group, 12(48%) belongs to 3-6 days close suction. With regard to duration of days on ventilator 10(40%) were belongs 4-6 days in close suction. 9(36%) were belongs in 4-6 days in open suctioning Method. With regards to frequency of suctioning per day 9(36%) were include in 7-9 times in close suctioning, 10(40%) were belongs >9 times in open suction. With regard to Mode of Mechanical Ventilator 9(36%) were belongs in controlled mechanical ventilator in close suction, 9(36%) were belongs in controlled mechanical ventilator in open suction, 9(36%) were belongs in synchronized intermittent mandatory ventilation in open suction method.

SECTION 2: Findings related to measure occurrence of ventilator-associated respiratory infections among patients undergoing close suctioning, type of suction.

Here, majority of the participants 19 (76%) were having moderate infection, only 6 (24%) were having mild infection and none of the participants were having severe infection.

Section 3: Findings related to measure occurrence of ventilator-associated respiratory infections among patients undergoing open suctioning, type of suction.

In that majority of the participants 22 (88%) were having moderate infection, 3 (12%) of the participants were having severe infection.

SECTION 4: Findings related to compare observation of open suction and close suction in terms of occurrence of ventilator-associated respiratory infections.

demographic variables like age, gender, family income, Total number of days of hospital admission, number of ventilator day, frequency of suctioning per day and mode of mechanical ventilator. Hence we conclude that there is no significant association between ventilators associated respiratory infection among patient under close suction and demographic variables of selected patients.

that the calculated chi square value was less than the chi square tabulated value at 0.05 level of significance for all the selected demographic variables like age, gender, family income, Total number of days of hospital admission, number of ventilator day, frequency of suctioning per day and mode of mechanical ventilator. Hence we conclude that there is no significant association between ventilators associated respiratory infection among patient under open suction and demographic variables of selected patients.

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