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Research Article

ASSESS COMPETENCY AMONG NURSES DURING ENDOTRACHEAL SUCTIONING AT ALLAMA IQBAL MEMORIAL TEACHING HOSPITAL, SIALKOT

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Abstract:

Background: Endotracheal tube (ETT) suctioning is one of the necessary invasive procedures carried out to clear airway secretions and maintain its patency for mechanical ventilation. However, if not carried out according to the current evidence-based practice recommendations, it will lead to inconsistent practices among nurses, affecting the health of the patient by causing ventilator-associated pneumonia, bleeding, infection, atelectasis, hypoxemia, cardiovascular instability, elevated intracranial bleeding, and may also cause lesions in the tracheal mucosa.

Objective: This study objective is to assess competency of nursing staff regarding endotracheal suctioning in at Allama Iqbal Memorial Teaching Hospital, Sialkot.

Methodology: A non-experimental, descriptive, quantitative and cross sectional design was utilized in this study. The sample size comprised 47 (n=47) nurses working in adult intensive care units. Data were collected using a structured questionnaire and divided into two sections. The first section was the demographic data, the second section comprised 25 questions. Data analysis was done by means of descriptive statistics to meet the study objectives.

Results: Participants having age 18 years to 60 years included in the study. Regarding assessment of knowledge and competency on ETS, when respondents were asked that respiratory system starts from which parts; 19.15% said oral cavity; 17.02% said from larynx; 25.53% replied trachea; 23.40% said lungs and alveoli and remaining 14.89% said pharynx. Meanwhile, when nursing personnel asked that either nurse must be sure about quality functioning equipment before suction, 53.19% said yes whereas 46.81% said no. Likewise, when respondents were asked the nurse is not responsible for assessing the patient's need for suctioning, 51.06% agreed and 48.94% disagreed. Overall, mean scoring of ETS questionnaire is 18.17.

Conclusion(s): This study concluded that nurses showed moderate level of knowledge and competencies of current evidence based guidelines on ETT suctioning. Concerns were raised about all aspects of endotracheal suctioning and highlighted the need for changes in nursing practice, with clinical guidelines and focused practice-based education.

Keywords: Competency; endotracheal tube; endotracheal suctioning; nurses; intensive care unit

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INTRODUCTION:

Endotracheal tube suction is a critical procedure done by nurses for neonates/adults on mechanical ventilator with endotracheal tubes to keep airways clear and lower the risk of nosocomial infections. However, this procedure has some risks including infections, lesions of the tracheal mucosa, cardiovascular disorders, hemorrhage, increase intracranial pressure, and hypoxemia (Alessa et al., 2021). Inserting a tube into the trachea by passing the upper airway and laryngeal structures creates an artificial airway. All patients with an artificial airway require endotracheal tube suctioning to remove secretions and prevent airway obstruction. The American Association for Respiratory Care (AARC) defined endotracheal tube suctioning as a component of bronchial hygiene therapy that involves the mechanical aspiration of pulmonary secretions from a neonate's/adults artificial airway to prevent its obstruction (Wood, 2021).

Endotracheal suctioning is done either by open or close procedures. In the open procedure, the neonates/adults are separated from the ventilator and suctioning is carried out while in the closed procedure the suctioning will be performed, while the neonates/adults are connected to the mechanical ventilator. The most used procedure for suctioning for neonates is an open suction (Javadi et al., 2020). Prior to suctioning of the endotracheal tube for neonates on mechanical ventilator, crucial considerations should be taken to prevent the potential complications. So, nurses should assess neonates who are on mechanical ventilator before, during and after suctioning through monitoring heart rate and rhythm, blood pressure, pulse oximetry, airway reactivity, tidal volumes, peak airway pressures, or intracranial pressure (Arroyo-Novoa et al., 2020).

On the other hand, competency is crucial for nurses to perform endotracheal suctioning in ICUs. Basically, competency represents the integration of knowledge, skills, values, and attitudes. Nurses' competency is a matter of concern worldwide and the complexity of assessing nurses' clinical competence has challenged educators for decades. Generic competencies are valid across different clinical contexts, whereas specific competencies are linked to specific areas of practice. Competency-based education is a outcomes-based approach to designing, implementing, assessing, and evaluating the educational programs (Khan & Ramachandran, 2020).

There are two types of clinical competencies: the general and the specific competencies. The general clinical competencies include following

the professional values, being able to communicate well, having good management skills, being able to work in a team, giving primary care, and taking on basic cultural traits. Some of the specific skills are knowing how to keep track of health and illness, judging the quality of nursing care, and doing things like endotracheal intubation, endotracheal tube suction, and airway management (Ghanbari et al., 2017).

Professional competence helps nurses perform well at work. Competence increases care skills and nursing education. Frustration and work discontent might impair nursing care when nurses don't know what they're doing. To improve nursing care, nurses must be strengthened and trained (Karami et al., 2017). One of the most frequent airway techniques used for newborns/adults on mechanical ventilator is endotracheal tube suctioning. Nonetheless, nurses should establish and adhere to standards of nursing practice via ongoing education in the knowledge, attitude, and skills necessary for providing high-quality care (Mohamed & Ahmed 2022).

Background of the study

Endotracheal suction remains unsafe worldwide. Nurses haven't followed many of the scientific guidelines for endotracheal suctioning, probably because they don't know enough about it (Jansson et al., 2021). So, endotracheal tube (ETT) suctioning is one of the most common airway procedures done for neonates/adults on mechanical ventilation. There are many problems that can arise from ETT suction, such as damage to the respiratory mucosa, atelectasis, hypoxemia, decreased saturation, and ventilator-associated pneumonia, which is a major problem that can hurt patients and make them stay in the intensive care unit longer (Schults et al., 2020).

The roles of nurses in ICUs are to observe ventilator closely and interfere to preserve ventilation and oxygenation in order to make sure that the needs of patients are met. So, nurses should be familiar with aseptic technique which considered essential when endotracheal suctioning procedure performed to reduce the risk of infection. So, washing hands before and after suctioning with putting on apron, gloves and goggles are recommended and should be done during suctioning (Alessa et al., 2021). Adequate knowledge along with the correct procedure performance is required to follow the aseptic technique which in turn prevents infection (Savita et al., 2021).

Indeed, the practice on ETT suctioning starts with patient's preparation, by giving an appropriate

explanation resulting a reduction in stress, pain and increase the effectiveness of the suctioning procedure (Mwakanyanga et al., 2018). The management of the artificial airway is one of the core competencies of the bedside respiratory therapist by maintaining the airway including the tracheal tube secure, the tube position, patency maintaining, and appropriate regulation of cuff pressure (Branson et al., 2014).

Unsafe ETT suction practices remain the problem worldwide even though there are scientific evidence for the safe and efficient technique of endotracheal suctioning are available, the recommendations practice have not been observed in nurses' clinical practice, due to poor knowledge about this procedure (Jansson et al., 2013). Moreover, most of the critical care nurses act in line with their own personal experience in their suctioning practice, rather than relying on scientific evidence (Zainib et al., 2017). They may also influence by associate factors such as demographic data include age, level of education, the working experience in the critical unit based on the research done in Tanzania (Mwakanyanga et al., 2018).

On other hand, a study on standard guidelines about open and closed system suctioning whereby, increased the level of knowledge, and brought the level of skills to a desired level. It is also stated

that most of the nurses skipped the steps of ETT suctioning, such as hyper oxygenation, hand-washing, recording of the procedure, and they did not base their practice on scientific evidence (Özden & Görgülü, 2012). Although there are many published studies on ETT suctioning worldwide, but the data in Pakistan however is limited. Based on researcher's observations and research evidence within critical care areas, it is possible to say that suctioning procedures differ between critical care nurses but not many published studies in this country consistent with the aims of this current study. Thus more data are needed regarding the competency of critical care nurses in Pakistan about ETT suctioning.

Research objectives

- ♣ To determine level of competency among nurses regarding endotracheal suctioning in their respective ICUs.
- ♣ To assess general knowledge about ETT among ICU nurses.

Research questions

- ♣ What is the level of competency among nurses regarding endotracheal suctioning in ICU?
- ♣ How well-versed are ICU nurses in ETT suctioning?

Conceptual & operational definitions

Terms	Conceptual definition	Operational definition
ETT suctioning	The process of applying negative pressure to the distal ETT or trachea by introducing a suction catheter to clear excess, or abnormal, secretions (Allison, 2020)	Endotracheal suctioning refers to the procedure that is performed by the nurses in critical care wards in AIMTH.
Critical Care	The specialized care of patients whose conditions are life-threatening and require comprehensive care and constant monitoring, usually in intensive care units (Medicine Net, n.d.)	The care which is important for patients who have a life-threatening condition that requires a skilled and efficient nurse's providing comprehensive care to the patient.
Competency	Webster dictionary defines being competent as the quality of having sufficient knowledge, judgment, skill, or experience for some purpose. It could be reasoned that if one of the primary tasks of a doctor is diagnosing illnesses and providing interventions to improve the condition of patients, then a clinically competent doctor would be someone who has the knowledge, judgment, skill, and experience to diagnose correctly and, in addition, who is capable of providing appropriate treatment interventions (Burg, Lloyd, & Templeton, 1982).	A description of competence according to the tasks of the clinical encounter, such as history taking, physical examination, use of laboratory tests, patient management, record keeping, etc. was helpful to get insights on the purpose and consequence of physicians' behaviors.

MATERIALS & METHODS:

Study design: A descriptive, cross-sectional, quantitative study design used in this study because a population, circumstance, or phenomenon's traits, actions, and trends can be precisely and methodically described using a descriptive study design. Descriptive research design is a powerful tool used by scientists and researchers to gather information about a particular group or phenomenon.

Study setting: This research work carried out at Allama Iqbal Memorial Teaching Hospital, Sialkot.

Study duration: This study conducted over a period of 4 months (From Sep, 2025 to Dec, 2025).

Sample size: The sample size determined by considering the population size, level of confidence, and margin of error through a power analysis. Solvin's formulae used to draw sample for the study as under:

N= Population = 53; n= Sample Size; E= Margin error = 0.05

$$n = \frac{N}{1 + N(E)^2}$$

$$n = \frac{53}{1 + 53(0.05)^2}$$

$$n = \frac{53}{1 + 53(0.0025)}$$

$$n = \frac{53}{1 + 0.1325}$$

$$n = \frac{1.1325}{n = 46.80}$$

Hence, required sample for the study is 47.

Sampling technique: Non-probability, convenience sampling technique employed in the research work.

3.6. Sample selection criteria**a. Inclusion criteria**

- Registered nurses working in critical care wards.
- Nurses having experience more than one year in ICU.

b. Exclusion criteria

- Those who hold administrative positions in ICU.
- Nurses having less than one year experience in critical care unit.
- Student nurses in ICU.

Study tools: Structured questionnaire contained of close-ended questions used to collect data from study respondents contained of following sections as under:

Section A: it is consisted of nurses personal characteristics as: gender, age, educational level, years of experience in nursing field, years of

experience in critical care unit, attending ICU educational programs.

Section B: Section II: As per subject competency of nurses measured by using a structured questionnaire about endotracheal tube suctioning. It consisted of 5 sections assessing general knowledge, preparation, implementation, post-care, and true/false questions. 2) The questionnaire contains multiple choice and true/false questions to evaluate nurses' understanding of indications for endotracheal tube suctioning, appropriate suction catheter size selection, suctioning procedure and parameters, documentation, and potential complications. 3) It aims to enhance nurses' knowledge about performing endotracheal tube suctioning safely and effectively for critically ill patients requiring mechanical ventilation. The questionnaire is consisted of 25 items. The items rated and scored according to the following patterns: Each question have two responses,

1. A correct answer given a score of 1.
2. An incorrect answer given a score of 0.

The nurses' responses calculated and recorded. The total score of the nurses' competency questionnaire ranged

from a minimum score of 6 to a maximum score of 25 and categorized as follows:

1. A score of 6 - 12 (< 50%) denoted inadequate results.
2. A score of 13 - 18 (50% < 75%) indicated adequate results.
3. A score between 19 and 25 (> 75%) showed good results.

Method of data collection: The researchers distributed the questionnaire to the nurses in each group at the critical care unit who agreed to participate in the study and then clarify the objective of the study to the participants. The usual time taken to complete the questionnaire was around 20 to 30 minutes. After the questionnaire completed, the investigator gathered and ensured that the questionnaire sheets were fully completed.

Ethical consideration: The present study approved by the Ethics Committee of College of Nursing, Khawaja Muhammad Safdar Medical College, Sialkot. All necessary permissions for conducting the research was obtained from the relevant administrators and all methods performed in accordance with the relevant guidelines and regulations. Furthermore, a session also held after the selection of the participants for explaining the study objectives and procedures. Written informed consent forms were also taken from all the participants.

Data analysis: The collected data organized, tabulated and statistically analyzed using the statistical package for social sciences (SPSS),

version 29. Descriptive analysis performed and data were presented in frequencies and percentages. Furthermore, data were also presented in the form of bar/pie charts.

RESULTS:

Table 1 presenting socio-demographic characteristics of participants in which 8 (n=17.02%) respondents were between 18 years to 25 years old; 10 (n=21.28%) belonged to age 26 years to 35 years; 12 (n=25.53%) having age 36

year to 45 year and remaining 17 (36.17%) nursing personnel had age from 46 years to 60 years. As per years of experience in intensive care unit (ICU), 63.83% having one to five years; 21.28% from six to ten years and rest of 14.89% having eleven to fifteen years intensive care unit experience. Now as per attending status of ICU educational seminars/workshops, only 31.91% respondents attended while 68.09% didn't as shown in figure 1-3.

Table 1: Socio-demographic characteristics of participants (n=47)

Variables	Frequency (f)	Percentage (%)
t		
18-25	8	17.02
26-35	10	21.28
36-45	12	25.53
46-60	17	36.17
Total	47	100.00
Gender		
Male	0	0.00
Female	47	100.00
Total	47	100.00
Educational level		
Bachelor of nursing (BSN)	35	74.47
Diploma in nursing	8	17.02
Secondary nursing school diploma	4	8.51
Total	47	100.00
Years of experience in field of nursing		
1-5	6	12.77
6-10	24	51.06
11-15	17	36.17
Total	47	100.00
Years of experience in intensive care unit (ICU)		
1-5	30	63.83
6-10	10	21.28
11-15	7	14.89
Total	47	100.00
Attending ICU educational seminars/workshops		
Yes	15	31.91
No	32	68.09
Total	47	100.00

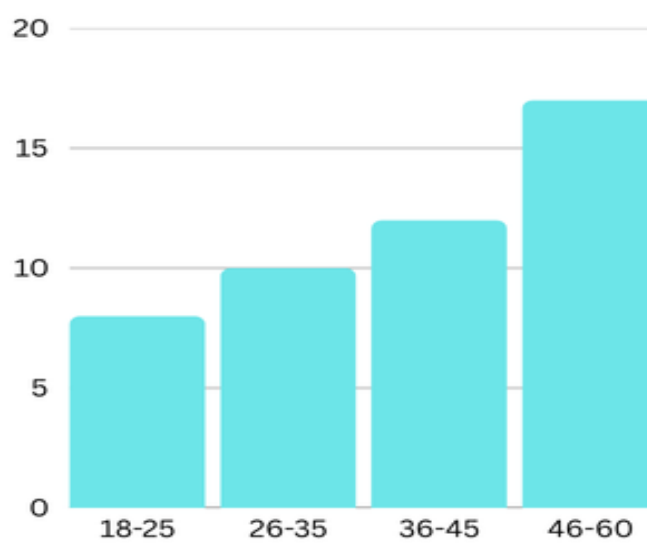


Figure 1: Age of participants (Years)

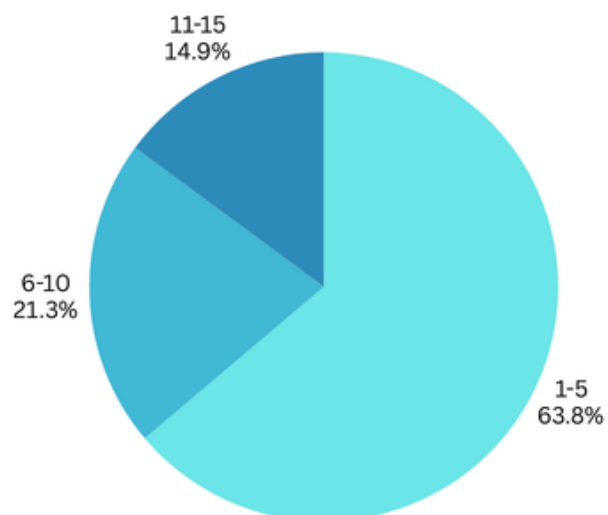


Figure 2: Years of experience in ICU

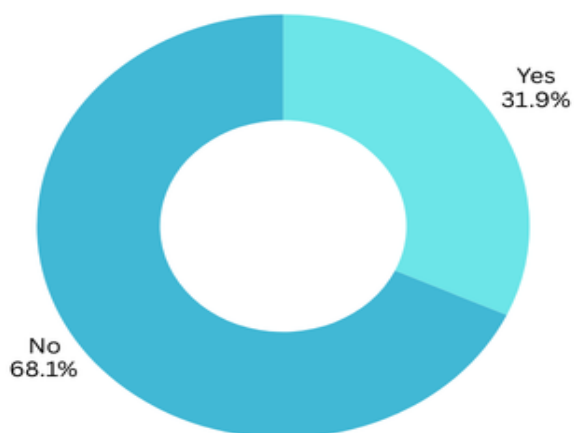


Figure 3: Status of attended ICU educational seminars/workshops

Table 2 indicating assessment of competency of ETT suctioning among nursing personnel, a structured questionnaire contained of five sub-scales used. First section is about general knowledge of ETS, when respondents were asked that respiratory system starts from which parts; 19.15% said oral cavity; 17.02% said from larynx; 25.53% replied trachea; 23.40% said lungs and alveoli and remaining 14.89% said pharynx. On the other side, when respondents were asked that after insertion of ETT nursing care included, 12.77% said auscultate chest sound for bilateral entry; 25.53% respondents said fixation of ETT using gauze or blaster; 34.04% replied putting oral airway to prevent biting of ETT; 23.40% replied oral & ETT suctioning to prevent accumulation of secretions while rest of 4.26% said all of the above.

Table 2 showed preparation of ETS, when respondents were asked the patient must be assessed for the need of ETS through, 23.40% said auscultate the chest sound for crackles, snoring and rattle; 17.02% said noticing cyanosis in nails, skin & lips; 27.66% said presence of excess secretions around the mouse & tube; 14.89% replied decrease oxygen saturation because of difficulty in breathing whereas 17.02% said all of the above. When respondents were asked insertion of catheter into ETT is what type of procedure, 29.79% said a sterile; 25.53% said a clean; 40.43% said a both whereas remaining 4.26% said none of the above.

Table 2 indicating implementation of ETS, when participants were asked that hyper-oxygenation before starting ETS helps; 17.02% said avoid the incidence of hypoxemia; 19.15% said easy remove accumulated secretions; 25.53% said decrease the risk of respiratory infection; 31.91% said improve patients conscious level and rest of 6.38% said none of the above. Similarly, when participants asked about duration of aspiration, 21.28% said 20 seconds; 34.04% said 15 seconds; 29.79% said 30 seconds and remaining 14.89% said 60 seconds.

Table 2: Assessment of nursing personnel competency regarding ETT suctioning (n=47)

Sr. no.	Statements	Frequency (f)	Percentage (%)
I-General Knowledge about endotracheal suctioning			
1	The respiratory system start with which of the following parts:		
	a) Oral cavity	9	19.15
	b) Larynx	8	17.02
	c) Trachea	12	25.53
	d) Lungs & alveoli	11	23.40
	e) Pharynx	7	14.89
Total		47	100.00
2	Endotracheal tube (ETT) insertion is indicated to:		
	a) Prevent of gastric juice aspiration	10	21.28
	b) Facilitate tracheal suctioning	14	29.79
	c) Supply the body with high concentrated oxygen	8	17.02
	d) Connect the patient with mechanical ventilator	9	19.15
	e) All of the above	6	12.77
Total		47	100.00
3	Which of the following is nursing care after insertion of ETT?		
	a) Auscultate chest sound for bilateral entry	6	12.77
	b) Fixation of ETT using gauze or blaster	12	25.53
	c) Putting oral airway to prevent biting of ETT	16	34.04
	d) Oral & ETT suctioning to prevent accumulation of secretions	11	23.40
	e) All of the above	2	4.26

Total		47	100.00
4	Which of the following is indication to connect the patient with mechanical ventilator?		
	a) Loss of consciousness	11	23.40
	b) Brain & spinal injury	12	25.53
	c) Respiratory system order	14	29.79
	d) During surgical operations	4	8.51
	e) All of the above	6	12.77
Total		47	100.00
5	When ETT suctioning done for critically ill patient?		
	a) As a routine schedule	6	12.77
	b) When necessary	18	38.30
	c) Every 4 hours	12	25.53
	d) Every 6 to 8 hours	11	23.40
Total		47	100.00
II-Preparation for ETT suctioning:			
6	The patient must be assessed for the need of ETT suctioning through:		
	a) Auscultate the chest sound for crackles, snoring and rattle	11	23.40
	b) Noticing cyanosis in nails, skin & lips	8	17.02
	c) Presence of excess secretions around the mouse & tube	13	27.66
	d) Decrease oxygen saturation because of difficulty in breathing	7	14.89
	e) All of the above	8	17.02
Total		47	100.00
7	All of the equipment used for ETT suctioning Except:		
	a) Sterile suction with different size	11	23.40
	b) Portable or central vacuum machine	12	25.53
	c) Syringe with 10cc normal saline	7	14.89
	d) Sterile gloves	11	23.40
	e) Sodium bicarbonate solution	6	12.77
Total		47	100.00
8	While selecting the size of catheter, it should be:		
	a) Less than half of internal diameter of ETT	8	17.02
	b) More than internal diameter of ETT	13	27.66
	c) Any available size	9	19.15
	d) Equal to internal diameter of ETT	12	25.53
	e) None of the above	5	10.64
Total		47	100.00

9	Before suctioning of ETT, patient should be kept in following position?		
	a) Semi-sitting	12	25.53
	b) Supine	14	29.79
	c) Side lying	9	19.15
	d) Prone	12	25.53
	e) All of the above	0	0.00
Total		47	100.00
10	What is the recommended suction pressure setting?		
	a) 130-160mmhg	12	25.53
	b) 100-120mmhg	11	23.40
	c) 120-150mmhg	13	27.66
	d) 150-200mmhg	7	14.89
	e) 200-250mmhg	4	8.51
Total		47	100.00
11	Insertion of catheter into endotracheal tube is?		
	a) A sterile procedure	14	29.79
	b) A clean procedure	12	25.53
	c) A sterile and clean procedure	19	40.43
	d) None of the above	2	4.26
Total		47	100.00
III-Implementation of ETT suctioning			
12	Hyper oxygenation of the patient before starting ETT suction helps to:		
	a) Avoid the incidence of hypoxemia	8	17.02
	b) Easy remove accumulated secretions	9	19.15
	c) Decrease the risk of respiratory infection	12	25.53
	d) Improve patient's conscious level	15	31.91
	e) None of the above	3	6.38
Total		47	100.00
13	During suction procedure, when aspiration of secretions should be applied:		
	a) During withdrawal of suction catheter only	9	19.15
	b) During insertion of suction catheter only	10	21.28
	c) Either during or withdrawal of suction catheter	12	25.53
	d) Only if the patient coughs	11	23.40
	e) All of the above	5	10.64
Total		47	100.00
14	The duration of aspiration of suctioning should not be more than:		
	a) 20 seconds	10	21.28
	b) 15 seconds	16	34.04
	c) 30 seconds	14	29.79

	d) 60 seconds	7	14.89
Total		47	100.00
IV-Post ETT suctioning care			
15	Which of the following actions nurses should do, in case of found accumulated thick secretions post ETT suctioning?		
	a) Using normal saline to dissolve thick secretions	12	25.53
	b) Using ringer to dissolve thick secretions	11	23.40
	c) Using sodium bicarbonate to dissolve that thick secretions	14	29.79
	d) Using dextrose 5% to dissolve that thick secretions	10	21.28
Total		47	100.00
16	Which of the following are possible complications of suctioning procedure?		
	a) Decreased oxygen level	8	17.02
	b) Abnormal heart beat	12	25.53
	c) Improved of conscious level	13	27.66
	d) Elevated of body temperature	10	21.28
	e) Damage to mucosal membrane	4	8.51
Total		47	100.00
17	Which of the following should be documented in the nursing care notes after ETT suctioning?		
	a) Color, amount & thickness of secretions	9	19.15
	b) General condition of the patient	11	23.40
	c) Psychological condition of the patient	13	27.66
	d) Temperature degree of the patient	9	19.15
	e) All of the above	5	10.64
Total		47	100.00
V-True/false questions			
18	The nurse must be sure about quality functioning equipment before suction.		
	a) Yes	25	53.19
	b) No	22	46.81
Total		47	100.00
19	The nurse is not responsible for assessing the patient's need for suctioning.		
	a) Yes	24	51.06
	b) No	23	48.94
Total		47	100.00
20	The main indication of suctioning is restlessness of the patient.		
	a) Yes	25	53.19
	b) No	22	46.81

Total		47	100.00
21	It is not necessary to check the pressure of suction unit before suctioning.		
	a) Yes	27	57.45
	b) No	20	42.55
Total		47	100.00
22	Hyper oxygenation is very important before and after suctioning procedure.		
	a) Yes	30	63.83
	b) No	17	36.17
Total		47	100.00
23	The suction catheter can be used even if it touches unclean surface.		
	a) Yes	25	53.19
	b) No	22	46.81
Total		47	100.00
24	The nurse document amount, odor and color of secretion to evaluate patient's condition.		
	a) Yes	33	70.21
	b) No	14	29.79
Total		47	100.00
25	Incidence of mechanical ventilator associated pneumonia is not related to suctioning procedure.		
	a) Yes	31	65.96
	b) No	16	34.04
Total		47	100.00

Table 3: Mean scoring of nursing personnel competency questionnaire regarding ETT suctioning (n=47)

No. of participants	Sum Q1-Q25	Mean score
1	0	0
2	13	0.52
3	8	0.32
4	13	0.52
5	13	0.52
6	9	0.36
7	8	0.32
8	7	0.28
9	6	0.24
10	8	0.32
11	6	0.24
12	5	0.2
13	13	0.52
14	5	0.2

15	11	0.44
16	10	0.4
17	5	0.2
18	15	0.6
19	16	0.64
20	12	0.48
21	7	0.28
22	12	0.48
23	12	0.48
24	7	0.28
25	16	0.64
26	13	0.52
27	12	0.48
28	15	0.6
29	13	0.52
30	11	0.44
31	15	0.6
32	13	0.52
33	11	0.44
34	10	0.4
35	10	0.4
36	8	0.32
37	10	0.4
38	12	0.48
39	6	0.24
40	6	0.24
41	6	0.24
42	7	0.28
43	7	0.28
44	7	0.28
45	7	0.28
46	6	0.25
47	12	0.48
		18.17

Table 2 showed post-suction care, actions nurses should do, in case of found accumulated thick secretions post ETT suctioning, 25.53% said using normal saline to dissolve thick secretions; 23.40% said using ringer to dissolve thick secretions; 29.79% said using sodium bicarbonate to dissolve thick secretions while 21.28% said using dextrose 5% to dissolve thick secretions. Meanwhile, when nursing personnel asked that either nurse must be sure about quality functioning equipment before

suction, 53.19% said yes whereas 46.81% said no. Likewise, when respondents were asked the nurse is not responsible for assessing the patient's need for suctioning, 51.06% agreed and 48.94% disagreed.

Table 2 recorded that the nurse document amount, odor and color of secretion to evaluate patient's condition, 70.21% said yes and remaining 29.79% disagreed. In the meanwhile when participants

asked that incidence of mechanical ventilator associated pneumonia is not related to suctioning procedure, 65.96% agreed and remaining 34.04% disagreed. **Table 3** indicating mean scoring of ETS questionnaire and found total score of questionnaire is 18.17.

DISCUSSION:

Endotracheal suctioning (ETS) is a necessary treatment that uses an artificial airway to remove accumulated lung secretions from the tracheobronchial tree. In order to prevent common infections like ventilator-associated pneumonia (VAP), it is essential that this technique be carried out with professional competence based on current scientific evidence and recommendations that guarantee efficiency and patient safety. Based on our result findings, moderate level of knowledge and competency found among nursing staff and these findings are comparative to Aurangzeb et al. who revealed majority of nurses had poor knowledge about ET suctioning.

Likewise, our study result is inconsistent with the findings of Ali Abbas Raoof who concluded that the majority of nursing staff had inadequate knowledge of endotracheal suctioning while this study showed moderate level of knowledge and competency reported by nursing staff. Therefore, it is necessary to upgrade nurses' knowledge on endotracheal suctioning through in-service education programs.

Moreover, Fauzia et al. concluded that the study's participants working in ICUs of tertiary care hospitals have good knowledge and practice of endotracheal suctioning and this is opposite to our result as nursing personnel were incompetent to perform ETS. On the contrary, Lamichhane et al. reported that majority of nursing staff in India showed moderate level of knowledge regarding ETT suctioning and this is quite similar to current study result.

In addition, our study findings are inconsistent with the findings of Susmita Shrestha and Rosy Shrestha who reported majority of nursing staff had inadequate knowledge and unsatisfactory expertise on endotracheal suctioning. Hence, it is strongly recommended for need of protocol for endotracheal suctioning and keen supervision and reinforcement for implementing the protocol.

CONCLUSION:

Result indicated that majority of nursing staff didn't attend educational seminars on improving intensive care clinical skills even they didn't have sufficient experience in treating of critical care patients in ICUs. However, as per competency and knowledge on ETT suctioning, moderate level of

expertise found among nursing staff necessitating to take proactive actions by administration and department heads by improving knowledge and clinical skills through rotational duties and conducting apprenticeship training of nursing personnel to attain optimum level of patient outcomes.

RECOMMENDATIONS

- Develop periodic educational and training courses for nurses working at intensive care units regarding care of endotracheal tube suction on mechanical ventilator. Further research should be done with large sample is recommended to ensure generalization of the results.
- Conducting the study in different settings in Punjab, Pakistan region to generalize the results of the study and raise the level of competency of nursing care regarding endotracheal tube suction is recommended.
- Competency-based ongoing in-service education programs need to be conducted to update the nurse practitioners of the standard guidelines and protocols related to the management of patients with ETS. Stringent healthcare policies to be implemented in every healthcare organization looking for better quality care outcomes. Hospital accreditations to be conducted periodically to ensure quality healthcare services. Reinforcement, recognition, and rewards for best nursing care practices can be few strategies adopted by healthcare managements to promote manpower productivity and efficiency.
- The Ministry of Health in Pakistan must shift nursing practices from tradition-based to science (evidence)-based. Developing evidence-based practice guidelines and encouraging hospital administration to adopt clinical guidelines for endotracheal suctioning in critical care units for nurses to follow is essential. The most important advice is to conduct regular training sessions (workshops and lectures) grounded in empirical studies to raise nurses' proficiency regarding endotracheal suctioning.

LIMITATIONS

There are several limitations as under:

- ❖ The study is descriptive in nature and hence limits the scope of obtaining objective evidences through observational, longitudinal studies.

- ❖ Heterogeneity of samples and small sample size were other concerns of this study. The study has a limited sample size which may not be representative of the overall population of nurses who perform endotracheal suctioning in ICUs of tertiary Care.
- ❖ Only articles published in English were considered for reviews, which may have produced language bias regarding the conclusion as there were studies published in other languages.
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