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Knowledge and Practices of Intensive Care Unit Nurses Regarding Endotracheal Tube Suctioning at Tertiary Care Hospital

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ABSTRACT

One of the ten most important nursing interventions is Endotracheal Aspirating (ETS) that critical care nurses provide to intubated patients. The ICU nurse is responsible for performing endotracheal suction, which helps mechanically ventilated patients who are unable to clear their airways of secretions and improves oxygenation and ventilation. **Objective:** To evaluate the expertise and behaviors of critical care nurses in tertiary care hospitals with regard to endotracheal tube suctioning. **Methods:** This study employed a cross-sectional design with purposive sampling. A total of 150 staff nurses were included as the research population. **Results:** As the study followed a descriptive cross-sectional approach, descriptive statistics were utilized. Frequency distribution was calculated, and data normality was assessed. The study reported that the participants with good knowledge were 55 (39.3%) and the participants with moderate knowledge were 50 (35.7%) and those with poor knowledge were 25 (25.0%). The participants with Good Practice were 78 (52.0%) and participants with Poor Practice were 72 (48.0%). **Conclusion:** The majority of nurses had excellent understanding and appropriate procedures about suctioning endotracheal tubes, according to the study's findings.

INTRODUCTION

Maraş GB *et al.*, in 2017 emphasized that suctioning is an important nursing technique when a patient in the rigorous overhaul unit has an endotracheal pipe (ETT) [1]. Aboalizm SE and Elhy AH in 2019 suggested that a patient has a ventilator placed in place, vacuuming is the surgical aspiration of lung fluids [2]. Raoof AA and Baeez YK in 2024 emphasized that in a healthy person, the cough reflex, the local immune system, and the action of ciliated cells in the airways are all necessary for the destruction and removal of microorganisms as well as the removal of waste from the lungs [3]. Aboalizm SE and Elhy AH in 2019 suggested that critical care nurses provide to intubated patients. The ICU nurse is responsible for performing endotracheal suction, which helps mechanically ventilated patients who are unable to clear their airways of secretions and improves oxygenation and ventilation [2]. Endoscopic sucking involves applying low pressure to the lungs while a catheter with suction is placed into the throat via an endotracheal tube to remove bronchial secretions, is one component of respiratory sanitization healing for mechanically ventilated patient. Aboalizm *et al.*, in (2019) found that endotracheal suctioning prevents the buildup of excessive secretions in the lungs, preserves airway integrity by reducing bacterial accumulation, ensures optimal oxygenation, and ultimately helps save patients' lives [2]. Aboalizm *et al.*, in (2019) found that high technical proficiency in suctioning is necessary

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for nursing care of these individuals since it has been shown to be a potentially dangerous treatment linked to a number of consequences, including trauma, a narrowing of hypoxemia, and heart failure, lesion of the tracheal mucosa, bleeding, elevate intracranial pressure and death [2]. The future prospects of patients, including the decrease of morbidity, mortality, duration of hospitalizations, and expenses, is directly impacted by the proper method and conformity to ETS standards. However, nurses often do ETS with insistence to standard practices [4, 5]. According to current study guidelines, it is expected that between 30 and 40 percent of these individuals do not get treatment, and at least 20 percent receive possibly hazardous care [6]. There are different approaches of endotracheal suction, including closed suctioning, uncluttered suctioning, and in-line suctioning [7]. Closed suctioning is a method in which the drain remains bounded in a wrapper during the suction process to reduce the risk of contamination and oxygen desaturation [8]. Open suctioning involves removing the endotracheal tube from the patient's mouth or nose to perform the suctioning procedure, and in-line suctioning is a method in which the intubation tube has a unique adaptor that is used to insert the evacuation pump [9, 10].

METHODS

The study employed a cross-sectional design. A purposive sampling technique was utilized, and the study population comprised staff nurses from the medical wards, surgical wards, and intensive care unit of Jinnah Hospital, Lahore. The study was conducted at Jinnah Hospital, Lahore, over a duration of nine months. The sample size was 142, calculated using Slovin's formula. Data were collected using an adapted questionnaire assessing the knowledge and practice of intensive care unit nurses regarding endotracheal tube suctioning. Student nurses, internship nurses, and newly employed nurses were excluded from the study. Following data collection, the information was analyzed using SPSS version 22.0.

RESULTS

This demographic table showed that majority of age group with 25-30 years. Majority of population were female, with single marital status. Majority of the nurses with 1-5 years' experience, with Diploma in Nursing. Majority of nurses working were in ICUs, with good acquaintance concerning "How repeatedly should endotracheal suction to being ended". Mainstream of the Participants have good knowledge regarding "which is the best method of suctioning". Majority of the Contributors have good familiarity concerned. While giving nasotracheal suctioning to an adult patient, suction catheter should be inserted up to'. "Maximum time limit for an endotracheal suctioning"(Table 1).

Table 1: Demographic Characteristics of ICU Nurses

Variables	Category	Frequency (%)
Age	21-25 Years	19 (12.7%)
	26-30 Years	80 (53.3%)
	31-35 Years	49 (32.7%)
	36-40 Years	2(1.3%)
Gender	Male	29 (19.3%)
	Female	121 (80.7%)
Marital Status	Single	39 (26.0%)
	Married	111 (74.0%)
Experience	1-5 Years	25 (16.7%)
	6-10 Years	99 (66.0%)
	11-15 Years	26 (17.3%)
Qualification	Diploma in Nursing	47 (31.3%)
	Post RN	87 (58.0%)
	BSN (Generic)	16 (10.7%)
Department	ICU	100 (66.7%)
	Emergency	26 (24%)
	Medical Wards	34 (%)
	Surgical Wards	3 (3%)

The data highlighted varying practices in endotracheal suctioning among healthcare professionals. While most follow recommended guidelines, inconsistencies in suction frequency, technique, and duration indicate a need for further training. Standardized protocols can help improve patient safety and care quality (Table 2).

Table 2: Knowledge Questionnaire on Endotracheal Suctioning Among ICU Nurses

Questions	Response	Frequency (%)
How often should laryngeal or throat suctioning be performed?	Every 2 Hours	24 (16.0%)
	Every 1 Hour	50 (33.3%)
	When Required	68 (45.3%)
	I Do Not Know	8 (5.3%)
Which is the finest technique for suctioning?	Disclosed Method	61 (40.7%)
	Openly Method	43 (28.7%)
	Both A and B	43 (28.7%)
	Don't Know	10 (6.7%)
Would a suction device be placed up to while administering nasotracheal vacuuming to a grown-up receptive?	10-15 cm	32 (21.3%)
	16-20 cm	68 (45.3%)
	21-25 cm	40 (26.7%)
	26-30 cm	10 (6.7%)
What is the permitted duration of an exhaustion procedure?	15 Seconds	34 (22.7%)
	20 Seconds	73 (48.7%)
	25 Seconds	30 (20.0%)
	30 Seconds	17 (11.3%)

When it came to "Auscultate respiratory sounds," the majority of those tested were proficient. A good deal of participants followed best practices when it came to "explaining the entire process to the individual." identifies vacuuming indicators. Majority of the participants were negative practice regarding "Places the patient in supine position with head slightly extended (Table 3).

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Table 3: Practice Questionnaire on Endotracheal Suctioning Among ICU Nurses

Questions	Response	Frequency (%)
Auscultate breath sounds	Done	109 (72.7%)
	Not Done	41 (27.3%)
Explain the procedure to the patient	Done	103 (68.7%)
	Not Done	47 (31.3%)
Identifies indications for suctioning	Done	114 (76.0%)
Places the patient in supine posture with the head somewhat outstretched	Not Done	36 (24.0%)
	Done	115 (76.7%)
	Not Done	35 (23.3%)

DISCUSSION

The present study assessed the knowledge and practices of Intensive Care Unit (ICU) nurses regarding endotracheal tube suctioning. The findings indicated variability in adherence to best practices, reflecting both gaps in knowledge and inconsistencies in technique. The results showed that 45.3% of participants performed suctioning only when required, while 40.7% preferred the closed suction method. The majority (79.6%) correctly identified that a nasotracheal aspiration catheter should be placed up to 16–20 cm in adult patients. Similarly, 76.0% of participants appropriately responded regarding the insertion depth for nasotracheal suctioning, and 71.3% adhered to the recommended suction duration of 20 seconds. However, discrepancies in following protocols were observed, such as only 49.7% explaining the procedure to the patient before suctioning, indicating areas for improvement in patient communication and education. These findings align with prior literature on the subject. The basis for assessing endotracheal suctioning techniques by critically examining the effectiveness of normal saline instillation [11]. Tembhare V and Singh S in (2021) emphasized the patient's perspective, highlighting the distress and discomfort experienced by ICU patients undergoing mechanical ventilation, reinforcing the need for evidence-based, patient-centered approaches [12]. Several studies have examined adherence to suctioning guidelines and knowledge gaps among critical care nurses. Jansson et al., in (2019) found inconsistencies in suctioning practices, while Majeed in (2017), Varghese and Moly in (2016), identified variations in skill levels among ICU nurses [13-16]. By further reinforcing these findings through a critical review of the available evidence on suctioning protocols [17, 18]. Pinto *et al.*, in (2020) provided a systematic review of suctioning knowledge and practice, complementing Salih's in (2017) dissertation, which assessed the suctioning performance of nurses in a military hospital setting [19, 20]. Infection control remains a crucial aspect of suctioning. Sharif *et al.*, in (2019) evaluated nurses' adherence to personal protective equipment (PPE) [21, 22]. Stacy in (2020) provided a comprehensive review of suctioning procedures, reinforcing the need for strict adherence to infection prevention measures [23]. Zeb *et al.*, in (2017) contributed a regional perspective by analyzing ICU nurses' practices in tertiary care hospitals in Peshawar [24]. Beyond suctioning practices, Tarar QR *et al.*, in (2024) extended the discussion to post-ICU transitions, underscoring the role of nursing care in ensuring a smooth recovery for patients [25]. Based on the findings of this study, several recommendations emerge. Future research should explore the impact of ongoing educational programs on improving ICU nurses' knowledge and skills related to suctioning. Additionally, simulation-based training should be investigated as a method to enhance nurses' confidence and proficiency. The effectiveness of standardized protocols and quality assurance programs in improving adherence to best practices and reducing complications should also be examined. Implementing these measures could lead to improved patient outcomes and a more standardized approach to endotracheal suctioning in ICU settings.

CONCLUSIONS

The current study concluded that the intensive care nurses have good knowledge and good practice regarding endotracheal tube suctioning it is clear that the intensive care unit nurses have a strong foundation of knowledge and practice regarding endotracheal tube suctioning. However, to further enhance their skills and stay updated with the latest advancements, it would be beneficial to implement ongoing educational programs. These programs can provide opportunities for continuous learning, allowing nurses to expand their knowledge, refine their techniques, and stay abreast of any new developments in the field. By investing in further educational programs, we can ensure that the nurses continue to provide the highest level of care to their patients.

Authors Contribution

Conceptualization: OA
Methodology: HS
Formal analysis: HS
Writing, review and editing: HS, SST

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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