

## INSIGHT OF ENDOTRACHEAL TUBE SUCTIONING AMONG INTENSIVE CARE NURSES

## AT A TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN

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**ABSTRACT****OBJECTIVES**

*The study assesses the knowledge level regarding endotracheal tube suctioning among intensive care unit nurses.*

**METHODOLOGY**

*A cross-sectional study design was used in tertiary care hospital in Karachi, Pakistan. 50 ICU nurses were recruited through a purposive sampling technique. The endotracheal tube suctioning knowledge assessment tool was adopted for the data collection.*

**RESULTS**

*Findings show that the respondent's gender most were male participants, 54% (n=27) and 46% (n=23) were females. Moreover, findings also revealed that only 12% of respondents had high knowledge, whereas 26% had moderate and 62% had low knowledge.*

**CONCLUSION**

*The study shows that only a few nurses found good knowledge, and more than half had low knowledge of ETS. Therefore, enhancing nurses knowledge about ETS through in-service education programs is mandatory.*

**KEYWORDS:** Knowledge, Intensive Care, Nurses, Endotracheal Tube, Suctioning

## INTRODUCTION

Airway management is primary care given to patients admitted to the intensive care unit. It includes placing an endotracheal tube into the patient's airway for those who cannot breathe.<sup>1</sup> Endotracheal suctioning (ETS) is probably one of the most common invasive procedures in patients with an artificial airway.<sup>2</sup> ETS enhances the clearance of respiratory-tract secretions, improves oxygenation, and prevents atelectasis.<sup>3</sup> ETS is a crucial nursing practice for patients in the intensive care unit (ICU) with an endotracheal tube (ETT). This procedure aims to keep the patient's airway open, improve ventilation and oxygenation, and avoid respiratory tract infections by avoiding secretion accumulation.<sup>4</sup> ETS is common in intensive care units because accumulated secretion increases critical respiratory discomfort, hypercapnia, hypoxia, atelectasis, and other complications.<sup>2</sup> The prognosis of patients is directly affected by the employment of the proper technique and adherence to ETS standards, such as decreased morbidity, mortality, length of hospitalisation, and expenses.<sup>5</sup> Improper suctioning can also lead to nosocomial infection; in advanced states, the percentage of nosocomial infection is 40%.<sup>6</sup> Moreover, an invasive procedure that increases the risk of contamination is suction. Therefore, washing your

hands before suction and using gloves, a gown, and eye protection is advised. A recent study also suggested that nurses should often wash their hands before suctioning.<sup>7</sup> Nurses should work carefully with evidence-based knowledge before, during, and after suctioning. Patient outcomes are directly impacted by the expertise and awareness of ICU nurses about endotracheal tube suctioning.<sup>8</sup> A complication arises due to mistakes in the practices. Nurses adhering to evidence-based guidelines can decrease complication prevalence.<sup>9</sup> The decreased level of knowledge about endotracheal suctioning among intensive care unit nurses could be dangerous for patients with artificial airways.<sup>10</sup> Even though ETS is a procedure that is required for both pediatric and adult patients, if it is not carried out properly, it can result in severe complications like bleeding, infection, hypoxia, bronchoconstriction, atelectasis, an increase in intracranial pressure, cardiac arrest, and Sudden death.<sup>11</sup> Nurses are unaware of current suctioning recommendations and practices they follow, which are on a traditional base rather than on evidence.<sup>4</sup> In this regard, A study from India shows that only 46% of the nurses knew the proper suction pressure for ETS, and only 36% had assessed the patients before suctioning. Only 62% of the nurses were seen to wash their hands before suctioning.<sup>5</sup> Additionally, another study from

Sari Lanka found that nurses have low knowledge regarding ETS, and the study emphasises the necessity for nurses to get ongoing professional development to overcome the gaps found and to set ETS practice guidelines for enhancing quality and safety in healthcare.<sup>12</sup> As a result, Nurses must maintain current knowledge of the evidence-based practices of ETS to perform the treatments and adequately minimise the Risks and difficulties for patients.<sup>13</sup> So, this study aims to assess the intensive care nurses knowledge regarding ETT Suctioning.

## METHODOLOGY

Quantitative Cross-Sectional Study on Intensive Care Unit Nurses conducted at PNS SHIFA Hospital Karachi. The study setting encompassed the hospital's medical, surgical, and cardiac ICUs. These units were chosen due to their relevance to critical care nursing and the availability of potential participants. A total of 50 nurses were chosen through the purposive sampling method. The sample size was calculated through the Slovin formula with a 95% confidence interval, and with a total population of 55, the obtained sample size was 50. The data collection period they have spanned four months, specifically from September 2022 to December 2022. The study focused exclusively on ICU nurses, ensuring the participants had a total working experience of six months. Furthermore, male and female nurses above 18 were eligible to participate. Moreover, those participants were included who had Valid PNC licenses. As this study targeted practising ICU nurses so, nursing students were excluded. Nurses who were employed in other departments or units of the hospital were not included in the study. Participants who expressed their unwillingness or refusal to participate in the study were excluded. Data was collected through a structured questionnaire that covered various aspects of endotracheal tube suctioning, including indications, contraindications, equipment selection, technique, and infection control measures. The tool was adopted via Email from the study conducted in Turkey.<sup>14</sup> According to this study, twelve experts (one anesthesiologist, two chest doctors, three ICU-experienced nurses, and six nurse academics) were first sent the questionnaire and checklist to evaluate the content validity. Based on the comments, corrections, opinions, and suggestions of the expert judges, the content of the questions, including their design, relevance, and semantic clarity,

was approved. Before the data collection, minor wording changes were made based on their input in the questionnaire and checklist. A pilot research was conducted with 10 ICU nurses from the three ICUs and other ICUs to determine the reliability of the knowledge-based questionnaire. The calculated Cronbach alpha value is 0.89.<sup>14</sup> The tool has two components the 1<sup>st</sup> one is socio-demographic data, and the other one is a knowledge assessment tool. The total score of the tool was converted into percentages. Those participants who scored below 50% were considered to have a low level of knowledge, 50-70% moderate level of knowledge, and above 70% high. Before the data collection, the study was approved by the Horizon School of Nursing and Health Sciences. After that, permission was granted from the HOD of the specific department of PNS Shifa Hospital. Informed consent was obtained from each participant, ensuring they were aware of the study's purpose, rights, and ability to withdraw at any time and used to analyse the collected data. SPSS version 26 was used. Frequencies and percentages were used for the demographic data and the knowledge assessment.

## RESULTS

This study evaluates the knowledge score about endotracheal tube suctioning among (n=50) nurses working in medical, surgical & cardiac ICUs of PNS SHIFA Hospital Karachi. Based on the obtained results in Table 1 regarding Socio-demographic structures, the current study shows that the respondents gender most they were male participants response of 54% (n=27) and 46% (n=23) were females, age criteria of subjects 76% (n=38) were 20-25 years age of subject's response more than the other age groups in which 08% (n=4) were 26-30 years, 10% (n=5) 31-35 years and 06% (n=3) were above 35 years age. Health care workers educational qualification, in which 70% (n=35) had a nursing diploma, 28% (n=14) had BSN, and 2% (n=1) had other qualifications responded in this project, the working experience of the study subjects in which 58% (n=29) had 02 to 05 years of clinical experience, 30% (n=15) had 10 years, and above, 10% (n=5) had 06 to 10 years, and 02% (n=1) had 1-year clinical experience and the Intensive care unit experience of the participants in which 38% (n=19) had 02 to 03 years of ICU experience, 34% (n=17) had less than 01 years and 28% (n=14) had more than 03 years ICU experience.

**Table 1: Demographic Data n=50**

Variables	Frequency	%Age
<b>Gender</b>		
Male	27	54.0
Female	23	46.0
<b>Age</b>		
20 to 25 years	38	76.0
26 to 30 years	04	8.0
31 to 35 years	05	10.0
Above 35 years	03	6.0
<b>Education</b>		
Diploma in Nursing	35	70.0
BSN	14	28.0
Others	01	2.0
<b>Total Working Experience</b>		
1 Year	01	2.0
2-5 Year	29	58.0
6-10 Years	05	10.0
Above 10 Years	15	30.0
<b>ICU Experience</b>		
Less than 1 Year	17	34.0
2-3 Years	19	38.0
Above 3 Years	14	28.0

Table 2 shows the knowledge score of participants in which 62% (n=31) had a low level of knowledge score, 26% (n=13) had a moderate level of knowledge, and 12% (n=6) had a high level of knowledge.

**Table 2: Levels of Knowledge**

Level of Knowledge	Frequency	%Age
Low level	31	62
Moderate level	13	26
High Level	06	12

## DISCUSSION

Tracheal (ET) intubation is one of the essential nursing skills for patients with diminished ability to breathe spontaneously. The nurses must have acquired enough information and practices to prevent complications.<sup>15</sup> The current study evaluates the extent of knowledge regarding ETS (n=50) nurses working in medical, surgical & cardiac ITCs of PNS SHIFA Hospital Karachi. The study findings indicate that most respondents were male participants, with 54% compared to 46% female participants. In contrast, a study shows that 66% were female participants.<sup>11</sup> This difference in gender distribution may have implications for the generalizability of the study's results. Regarding their age, 94% of the participants are between 21 and 30. Similarly, other study findings parallel to ours show that participants 94% were aged between 21 and 30.<sup>16</sup> This age distribution may be due to various factors, such as the nature of the study, the recruitment process, or the target population. However, it is essential to consider the potential impact of age on the study's results, as research has shown that age can influence various aspects of behaviour, cognition, and perception. Based on the obtained results regarding

knowledge assessment level, the current study shows that only 12% of respondents had good knowledge, whereas 26% and 62% had moderate and low levels of knowledge, respectively. Similarly, another study's findings are aligned and revealed that 70% of nurses reported having inadequate knowledge of endotracheal suctioning, while 75% reported having inadequate practice.<sup>17</sup> Another study found that the majority of participants (75%) knew when to use an endotracheal tube for suction, and more than half (56%) knew everything there was to know about endotracheal tube suction. They also knew about complications, essential precautions to lower their infection risk, and the ideal time to suction.<sup>18</sup> In contrast, another study found that one-fifth of the nurses scored favourably on knowledge of suctioning based on evidence. The study suggested regular in-service training courses may enhance nurses skills and knowledge. These findings suggest a significant gap in knowledge between nurses about this necessary procedure (ETS).<sup>19</sup> The lack of adequate training and education for healthcare personnel may be partly caused by a lack of information. Endotracheal suctioning training and education for medical practitioners must be ongoing.<sup>20</sup> Healthcare organisations should also make updated endotracheal suctioning guidelines and protocols available to ensure medical professionals know the most current best practices.<sup>21</sup>

## LIMITATIONS

Only 50 ICU nurses from a single tertiary care hospital in Karachi, Pakistan, made up the study's limited sample size. The generalizability of the results is constrained by the small sample size, which may not represent all ICU nurses in the area. Moreover, the study's main objective was to evaluate the ICU nurses knowledge of endotracheal tube suctioning. It did not assess how well the individuals performed or followed appropriate suctioning procedures in their clinical practice. As a result, the study cannot evaluate if the nurses skills results in safe and efficient suctioning techniques.

## CONCLUSIONS

According to the study, 12% of nurses had high knowledge of endotracheal tube suctioning, compared to 26% of moderate knowledge and 62% of low knowledge-intensive care nurses. These findings emphasise the need for targeted interventions to improve ICU nurses understanding of this critical procedure.

**CONFLICT OF INTEREST:** None

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- Shaista** - Data Analysis/Interpretation



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