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Knowledge and Attitude regarding Tracheostomy Care among Nurses at the Children's Hospital and University of Child Health Sciences, Lahore

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***Abstract*:**This system's goals are to preserve or protect the airway, lessen dead space in the airway, offer bronchopulmonary support, and make prolonged mechanical breathing easier for critically ill patients.A tracheostomy is a common surgery used to clear upper airway obstructions, provide mechanical ventilation, and remove tracheobronchial secretions across all age groups. This study aimed to assess knowledge and attitudes of nursing staff regarding tracheostomy procedures, as well as their demographic profile and associated factors.The study design was cross-sectional descriptive and planned sample size was 117 nurses. Non-probability convenient sampling techniques. The study setting was different department of the children hospital, Lahore. The study was completed in 06 months. Inclusion criteria of this study were nurses, participate in the study and willing to give informed consent. A study of 117 nurses found that tracheostomy tubes can cause skin discomfort and hinder oral feedings. Most respondents had spare tubes ready, and aspirating respiratory tract secretions was more effective. Mucus plugs can cause acute occlusion, and suctioning requires pressure of 180-200 mmHg. Nurses advised maintaining cuff pressure and checking and tightening the tracheostomy knot. 99% of nurses agreed to be knowledgeable about tracheostomies, taking necessary precautions, and participating actively. The study found that nurses possess adequate knowledge and attitude regarding tracheostomy care competency, but there are still gaps in understanding various tracheostomy care and management-related topics.

Keywords:Tracheostomy, Nurses, knowledge, attitudes.

1.Introduction

Tracheostomy, a surgical technique first applied by Egyptians around 3600 B.C., involves creating an ostium in the trachea's anterior wall. Jackson introduced a new method in 1909, establishing a standard process for systemic tracheostomy. He emphasized making a broad, lengthy incision to divide the thyroid isthmus(Vimal Dass, 2022).Tracheostomy has become less necessary due to antibiotics, vaccines, and advancements in intubation and bronchoscopy. In the early 20th century, it was considered an optional procedure for paralytic poliomyelitis patients, but alternative techniques like percutaneous tracheostomy were explored. Thoracic surgeon Ciaglia described PT as a safe and successful option(Nasir et al., 2020).

Tracheostomy is performed using two methods: open surgical tracheotomy (ST) and percutaneous dilatational tracheostomy (PT). ENT surgeons typically perform ST, while PT has increased healthcare professionals' involvement, requiring knowledge of tracheostomy care and decannulation techniques(Casserly, Lang, Fenton, &Walsh, 2007).

The primary objectives of this system are to safeguard or maintain the airway, reduce airway dead space, provide broncho-pulmonary support, and facilitate mechanical breathing in critically ill patients(Kriner, 2021).A tracheostomy is a common surgery used to clear upper airway obstructions, provide mechanical ventilation, and remove tracheobronchial secretions across all age groups(Mosalli et al., 2022).

Tracheostomy is a procedure used to reduce complications associated with prolonged endotracheal intubation in intensive care units. It aims to reduce laryngeal damage, improve nursing care, and facilitate patient transfer. Indications include failed weaning, neurological conditions requiring prolonged mechanical ventilation, and when bronchial secretions clearance is necessary for airway patency(Uluç, Öngel, İlkaya, Devran, & Özçelik, 2023).Physical therapy contraindications vary, but children, urgent airway patency cases, anterior neck anatomical problems, thyroid goiter, failure to palpate cricoid cartilage, obesity, spinal cord injury, severe thrombocytopenia, uncorrectable coagulopathy, and inexperienced practitioners should be considered(Nam et al., 2020).

Initially, reevaluate patient's suitability for tracheostomy, obtain informed consent, and prepare for procedure. Administer sedatives, analgesics, and neuromuscular blockers, use mechanical ventilator, lengthen neck, check for bleeding, and ensure sterile equipment(Kim, Lee, Baek, & Park, 2023).Nurses must possess skills and knowledge to effectively care for tracheostomies, which are increasingly common in ICUs and general wards, minimizing potential problems and ensuring patient safety(Khanum, Gulzareen, Fizza, Buksh, & Nazir, 2023).

Skilled nurses need support, education, and training to handle patient's unique needs safely and efficiently. Lack of education can lead to serious issues. The trachea, a resonating tube, connects the larynx and bronchi, while the wind pipe, a vital airway part, is 10-12 cm long(Kolethekkat, Al Salmi, Al Abri, & Al Abri, 2023).

Tracheostomy cases have increased in recent decades, often performed on pediatric intensive care patients requiring chronic ventilatory support. If nurses lack necessary knowledge, managing a tracheostomy can pose challenges(Barrow, 2020; Mosalli et al., 2022).

A 2020 evaluation found granulomas and skin lesions at tracheostomy site were common surgical complications, with 6% procedure-related mortality in children due to cannula blockage or unintentional decannulation(Lubianca Neto, Castagno, & Schuster, 2022).75% of pediatric patients at IECC require multidisciplinary care, with nurses playing a crucial role in tracheostomy care, ensuring patient safety and reducing malpractice risks(Mosalli et al., 2022).Tracheostomy tube placement in CCUs improves patient comfort, reduces laryngeal injury risk, minimizes sedation, accelerates ventilator weaning, and shortens hospital stays through safe practice(Abu-Sahyoun et al., 2023).

Research shows multidisciplinary teams with specialized nurses improve patient outcomes and nursing care by lowering readmission rates, duration of stay, and nurse confidence among tracheostomy patients(McGrath et al., 2020).This study aimed to assess the impact of a tracheostomy care workshop on nurses' knowledge, attitudes, and skills, aiming to boost their confidence in handling post-tracheostomy patients.

1.1 Objective

- Knowledge of tracheostomy procedures among the nurses.
- The nurses' attitude toward providing tracheostomy procedures.
- Analyzed its demographical profile, such as age, education and experience

1.2 Research Questions

What level of tracheostomy procedure knowledge will the nurses possess? What is the opinion of the nursing profession on tracheostomy procedures? What will be the main factors influencing the nursing staff's perspective on and familiarity with tracheostomy procedures?

2. Methodology

This descrptive cross sectional studywas conducted at the children hospital & university of child health sciences Lahore.A Convenient sampling technique was adopted for this study. The study duration was 06 months after approval of synopsis. After taking approval from the research review board of the hospital. Informed consent was taken from the parents of all study contributors. A total 117 nurses were included in the study from target population. The Inclusion exclusion Criteria of the study was : The Inclusion Criteria

- Nurses that are employed in the children hospital & university of child health sciences.
- The participants' ages range from 25 to 45 years.

- Participants with more than 2 years of experience.
- Participants who were concerned to participate in the study.

And the Exclusion Criteria:

- Participants who were not willing to participate in the study
- Excluded from this were the head staff, nursing students, and paramedical staff.

2.1 Data Collection Process

All the participants were included in the study according to the inclusion and exclusion criteria. Informed consent was be obtained and proper explanation was be given to the participants. Confidentiality was be insured to protect the ethical rights of the participants. Self-structure questionnaire was used and its content validity will be tested .Lectures were prepared for the understanding of the subjects. A detail of demographics profile was recorded. Pre and post assessment was conducted to compare the effects of this training session regarding Knowledge and attitude of tracheostomy procedures.

The data was collected by using a self-designed Performa contains 15questions for knowledge assessment and 9 questions for attitude assessment. All the required information werecollected by the study participant. Before the workshop and after one month period, the practices of the nurses wereassessed by using questionnaire as standard check list.

Data analysis was the most important part of a research to depict the real picture of information. The data was analysed by SPSS version 21 for its proper analysis. The data was presented in the form of percentages, frequencies, mean & standard deviation for qualitative variables. Mean with standard deviation will be calculated for quantitative variables.

2.2 Ethical Considerations

Ethical considerations were observed according to the technical and Ethical Review Board(IRRAB)of Shaikha Fatima Institute of Nursing and Allied Health Lahore.

2.3 Limitations

All nurses of the children hospital & university of child health sciences cannot be included in the study, Data collection may take more time and a large sample size may give a more clear depiction regarding the knowledge and attitudeof nurses about tracheostomy.

3. Results

Demographic characteristics of study 117 participants were participated. 105 (89.7%) nurses were between the ages of 26 and 35 while, 7(6.0%) were between the ages of 20 and 25 years and 5 (4.3%) nurses were greater than age of 36 years.Shown in detail in table no. 6.1 and figure 6.1

Table 1: Description of Age, Qualification and Professional experiences

Variables	Number%
Age (Years)	
20-25	7(6.0%)
26-35	105 (89.7%)
36 >	5 (4.3%)

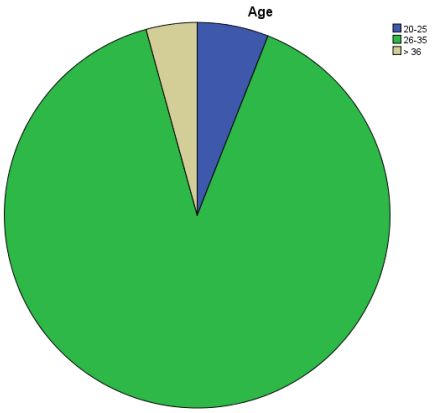

Figure. No 6.1 Description of Age

Out of 117 nurses, 11 (9.4%) seemed to be general Nursing & Midwifery, 82 (70.1%) were Post RN, 24(20.5%) were BSc Nursing. shown in table no. 6.2 and figure no. 6.2.

Table No. 6.2Description of Qualification and Professional experiences

Qualification	
General Nursing & Midwifery	11 (9.4%)
Post RN	82 (70.1%)
BSc Nursing	24(20.5%)
Professional experience (Years)	
1-5	5(4.3%)
6-10	106 (90.6%)
>10	6 (5.3%)

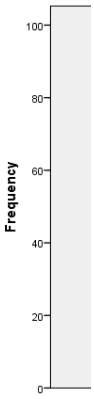

Figure 1: Description of Qualification

In this study, professional experience is been divided into groups: 5(4.3%) were mostly around 1-5 years of experience, 106 (90.6%) were between 6-10 years, and 6 (5.3%) were between greater 10 years. shown in figure no. 6.2 and table no. 6.3

Figure 2: Description of Professional Experience

Knowledge regarding tracheostomy of the 117 participants about tracheostomy, with 98.3% reporting skin discomfort from secretions around the cannula and 95.7% stating that it hinders oral feedings. 116 respondents had a spare tracheostomy tube ready, while 106 required routine dental care. Aspirating respiratory tract secretions was found to be more effective with tracheostomy tubes, according to 107 nurses.

A mucus plug can cause an acute occlusion of a tracheostomy tube, with 98.6% reporting this. 113 participants disagreed, stating that a tracheostomy kit should not be kept by the bedside in case of emergency. Suctioning through a tracheostomy tube requires a pressure of 180 to 200 mmHg, but 117 participants (100%) reported that a tracheostomy opening should always be kept dry and clean to prevent infection.

98 nurses (83.8%) maintained tracheostomy cuff pressure between 40 and 50 mmHg. 97.4% of nurses were aware of routine checking and tightening of the tracheostomy knot to prevent unintentional dislodging. 82 participants disagreed that the tube should be suctioned in less than 10 seconds, and 93.3% agreed that bleeding from the tracheostomy cannula is the most common side effect.

17 patients (17%) had prior experience with suctioning from their tracheostomy tubes more frequently at night than during the day, and 85.6% of participants knew that replacing the tracheostomy tie should be done daily.Shown in table no. 6.3

Table 2: Description of Knowledge regarding tracheostomy of study participants

Skin irritation may result from secretions around a tracheostomy cannula.	**(f)**	**Percentage (%)**
Agreed	115	98.3
Disagreed	2	1.7
Total	117	100.0
A tracheostomy tube prevents oral feeding for a patient.	(f)	Percentage (%)
Agreed	112	95.7
Disagreed	5	4.3
Total	117	100.0
There should always be a spare tracheostomy tube available due to the possibility of unintentional dislodging.	(f)	Percentage (%)
Agreed	116	99.1
Disagreed	1	.9
Total	117	100.0
An individual who has a tracheostomy tube needs routine dental care.	(f)	Percentage (%)
Agreed	106	90.6
Disagreed	11	9.4

Total	117	100.0
Aspirating respiratory tract secretions is more effective with tracheostomy tubes.	(f)	Percentage (%)
Agreed	107	91.5
Disagreed	10	8.5
Total	117	100.0
The most frequent reason for an acute occlusion of a tracheostomy tube is mucus plug	(f)	Percentage (%)
Agreed	115	98.3
Disagreed	2	1.7
Total	117	100.0
A tracheostomy kit should not be kept by the bedside in case of emergency.	(f)	Percentage (%)
Agreed	4	3.4
Disagreed	113	96.6
Total	117	100.0
Suctioning through a tracheostomy tube requires a pressure of 180 to 200 mmHg.	(f)	Percentage (%)
Agreed	102	87.2
Disagreed	15	12.8
Total	117	100.0
To avoid infection, a tracheostomy opening should constantly be maintained dry and clean.	(f)	Percentage (%)
Agreed	117	100.0
Total	117	100.0
Always keep the tracheostomy cuff pressure between 40 and 50 mmHg.	(f)	Percentage (%)
Agreed	98	83.8
Disagreed	19	16.2
Total	117	100.0
To prevent unintentional dislodging, the tracheostomy knot should be routinely examined and tightened.	(f)	Percentage (%)
Agreed	114	97.4
Disagreed	3	2.6
Total	117	100.0
A tracheostomy tube should be suctioned in no more than 10 seconds.	(f)	Percentage (%)
Agreed	35	29.9
Disagreed	82	70.1
Total	117	100.0
The most frequent side effect is bleeding from the tracheostomy cannula.	(f)	Percentage (%)
Agreed	108	92.3
Disagreed	9	7.7
Total	117	100.0

Patients need to suction from their tracheostomy tubes more often at night than during the day.	(f)	Percentage (%)
Agreed	20	17.1
Disagreed	97	82.9
Total	117	100.0
Every day should be spent changing the tracheostomy tie.	(f)	Percentage (%)
Agreed	100	85.5
Disagreed	17	14.5
Total	117	100.0

Attitude regarding tracheostomy of study participants' attitudes toward tracheostomies were examined, 116 (99.1%) of the 117 nurses agreed that nurses should be knowledgeable about tracheostomies and that they should recognize themselves. Another 110 (94.0%) nurses agreed that nurses should take all necessary precautions to prevent infection transmission, and another 110 (94.0%) nurses tried to determine whether nurses should be taught how to care for patients with tracheostomies. A total of 117 nurses (100%) made the decision that they should actively participate in their tasks, shorten the tracheostomy period, and use caution when handling patients who have tracheostomies.

A total of 110 nurses, or 94%, expressed confidence in their ability to care for patients with tracheostomies in high-dependency facilities. On the other hand, 114 nurses, or 97.4%, reported that it can be difficult to understand patients' needs and provide for them. Lastly, 103 nurses, or 88.0%), expressed satisfaction in their ability to care for patients with tracheostomies. Nurses voiced their frustration, dissatisfaction, and concerns with the overtreatment of patients with tracheostomies, while 34 (29.1%) participants shared similar concerns. The description is displayed in Table 6.4.

Table 3: Description of Attitude regarding tracheostomy of study participants

With all the knowledge regarding tracheostomy, do nurses have to recognize themselves?	(f)	Percentage (%)
Agreed	116	99.1
Disagreed	1	.9
Total	117	100.0
By taking all necessary precautions, infection transmission can be avoided.	(f)	Percentage (%)
Agreed	110	94.0
Disagreed	7	6.0
Total	117	100.0
By actively participating in their duties, nurses can shorten the timed period of tracheostomy.	(f)	Percentage (%)
Agreed	117	100.0
Disagreed	0	0.0
Total	117	100.0
The care of patients with tracheostomies should be taught to nurses.	(f)	Percentage (%)
Agreed	110	94.0
Disagreed	7	6.0
Total	117	100.0

When dealing with tracheostomy patients, nurses must take safety precautions.	(f)	Percentage (%)
Agreed	117	100.0
Disagreed	0	0.0
Total	117	100.0
Should patients with tracheostomies be housed in high-dependency facilities?	(f)	Percentage (%)
Agreed	110	94.0
Disagreed	7	6.0
Total	117	100.0
Understanding patients' needs and providing for them was challenging for nurses to do.	(f)	Percentage (%)
Agreed	114	97.4
Disagreed	3	2.6
Total	117	100.0
When caring for patients with tracheostomies, nurses expressed satisfaction.	(f)	Percentage (%)
Agreed	103	88.0
Disagreed	14	12.0
Total	117	100.0
Concerning the overtreatment of patients with tracheostomies, nurses expressed their annoyance, discontent, and worries.	(f)	Percentage (%)
Agreed	34	29.1
Disagreed	83	70.9
Total	117	100.0

3.1 Discussion

This study provides new insights into nurse education's impact on patient safety, satisfaction, and quality of care. It highlights the correlation between research questions, hypotheses, and literature, highlighting the need for transformation in nursing education.

Tracheostomy is a crucial lifesaving procedure, performed on ICU patients. Advancements in technique and equipment have reduced morbidity and mortality rates, and the indications have evolved to keep critically ill patients alive(Sangavi, Hariprasad, Ravikumar, & Suhas).

This study aims to identify knowledge gaps in hospital nursing staff and physicians regarding tracheostomy care and management, which will aid in creating curricula for medical and nursing residencies and provide institution-based recommendations for tracheostomy care and management.

A recent Finnish hospital intensive care unit study found that nurses often attend lectures and seminars on tracheostomy care, but this contradicts a study revealing a lack of nurses and knowledge(Khanum et al., 2023).A study by Mungan et al. employed 138 nurses as sample, with almost 88% of them being female(Nabil Malk, Mawed Fahem, & Abouda Abdelhamed Soultan, 2022).A larger percentage of participants (62%) were female in a study by with a sample size of 80 nursing students(Alotaibi et al., 2022).

Since all of the study's participants were female nurses, the results also shed light on a significant gender-related issue namely, the persistence of female dominance in the nursing field.

The majority of participants (45%) were aged 31-40 years, with 52.5% aged between 30-40 years and 10% over 50 years(Gaterega, Mwiseneza, & Chironda, 2021).

This study involved 117 nurses, with 105 (89.7%) aged between 26 and 35, and a smaller percentage (20.0%) aged 20-25. The majority (42.5%) had worked for 0-5 years and 6-10 years, respectively, while a small percentage

(3.8%) had worked over 16 years. These findings align with previous research(Nabil Malk et al., 2022). Where, respectively, 52.2% and 86% of the nurses have worked with patients who have had tracheostomies for fewer than five years (Gaterega et al., 2021).

The study categorized professional experience into three groups: 4.3%) with 1-5 years, 106 (90.6%) with 6-10 years, and 5.3% with more than 10 years, with 59% having a bachelor's degree.(Nabil Malk et al., 2022). Among the participants, more than half (37.5%) held a bachelor's degree. Furthermore, just 1.3% of nurses held a master's degree, which is consistent with findings from another study that shows that just 6.25% of nurses have completed postgraduate coursework(Gaterega et al., 2021).

In our survey, 82 (70.1%) were post-RNs, 24 (20.5%) were BSc nurses, and 11 (9.4%) appeared to be general nursing and midwifery.The majority of nurses had moderate understanding (71%) regarding tracheostomy care, according to the results of the current study. This is consistent with findings from an Indian study that reveals the majority of nurses (81.67%) have inadequate knowledge in this area(Alotaibi et al., 2022).

Additionally, a survey found that only 46.4% of nurses had a high enough level of expertise to accurately answer at least seven questions about tracheostomy care(Nabil Malk et al., 2022).

In two tertiary care institutions in Jeddah, a research in 2016 that evaluated nurses' confidence in tracheostomy care revealed that 88.6% of them lacked trust in caring for patients with a tracheostomy and giving ventilatory assistance(Mosalli et al., 2022).

Similarly, in Turkey, it was discovered that the degree of tracheostomy care expertise possessed by nurses in three tertiary state hospitals fell short of expectations(Mosalli et al., 2022).

Al Nemare, on the other hand, noted that while 60% of the nurses expressed confidence, 47% expressed uncertainty or did not feel they were knowledgeable about the most current developments in tracheostomy care. Since confidence level was connected with years of experience, the majority of the practice was experience-based rather than evidence-based, and over half of the participants appeared to have had insufficient training and support(Alnemare, 2020).

A crucial component of efficient airway control is tracheal suctioning. But there are a lot of hazards and difficulties involved with this, from hypoxia and trauma to, in the worst situations, cardiac arrest and death(Tembhare & Singh, 2021).

Similar results were observed in our study, where 95% of participants correctly answered the question regarding the appropriate tracheal suction time, whereas only 83.2% of individuals understood about suitable suction pressures.

Healthcare professionals and literature disagree on the use of normal saline instillation before suctioning. A meta-analysis found it doesn't improve heart rate, blood pressure, or pH in patients, and may cause decreased oxygen saturation. Despite this, sterile 0.9% saline is commonly used(Esmaeili, Abbasi, Shafei Lashkarian, & Sadeghi, 2020).

In our study, 91.5% of respondents claim that using tracheostomy tubes to aspirate respiratory tract secretions is more successful.A study found that caregivers for children with tracheostomies were more considerate than those working with older adults or teenagers, possibly due to their higher likelihood of seeing tracheostomies(Yorschua Jalil et al., 2020).

The study found that nurses have a strong attitude towards tracheostomies, with 99.1% agreeing that they should understand and identify themselves. 94.0% agreed that nurses should take necessary steps to prevent infection spread. 94% of respondents were confident in providing tracheostomy care in high-dependency settings. However, 29.1% expressed annoyance and displeasure about patients receiving excessive care for tracheostomies.

3.2 Limitations

The study has several limitations, including the inclusion of only volunteered nurses, a higher percentage of females due to hospital gender distribution, and focusing solely on theoretical evaluation of nurses. The evaluation of knowledge and attitude among nurses about tracheostomy care and early problem management could have been better understood if a simulation-based test was included. Additionally, the study's small sample size due to resource constraints prevents larger generalization of results, necessitating future studies with a larger sample size.

4. Recommendations

The study recommends a larger sample size for a more accurate assessment of knowledge and practice levels related to tracheostomy care and management. It suggests creating accessible policies and treatment plans for each

patient's bedside, implementing teaching interventions to improve nurses' knowledge and disposition. The study also emphasizes the need for continuing medical education seminars and simulation-based exercises for concerned nurses to address knowledge gaps and improve patient care.

4.1 Conclusion

Our research showed that nurses have a sufficient level of knowledge to be considered satisfactory. The study's results indicate a noteworthy descriptive analysis between the nurses' knowledge and attitude regarding tracheostomy care competency and their performance. It demonstrated that there are still gaps in our understanding of a number of tracheostomy care and management-related topics.

References

Abu-Sahyoun, R., ALBashtawy, M., Mohammad, K., Baker, N. A., Al-Sheyab, N., Alyahya, M., . . . ALBashtawy, B. (2023). Critical Care Nurses' Knowledge of Tracheostomy Care. *Iranian Journal of Nursing and Midwifery Research, 28*(5), 504-508.

Alnemare, A. K. (2020). Nurses training and confidence in management of tracheostomy patients in a community hospital in Saudi Arabia. *J Res Med Dent Sci, 8*(5), 110-118.

Alotaibi, F. Z., Alkhatabi, R., Allowaihiq, L., Alhazzani, H., Alshehri, G., Hajr, E. A., & Alkholaiwi, F. (2022). Assessment of the ability, perception, and readiness of nurses to manage tracheostomy-related complications in Riyadh City: a cross-sectional study. *BMC nursing, 21*(1), 320.

Barrow, C. (2020). Can a multidisciplinary trach team improve swallowing in patients with a tracheostomy? *Dysphagia Café*.

Casserly, P., Lang, E., Fenton, J., & Walsh, M. (2007). Assessment of healthcare professionals' knowledge of managing emergency complications in patients with a tracheostomy. *British journal of anaesthesia, 99*(3), 380-383.

Esmaeili, M., Abbasi, Z., Shafei Lashkarian, M., & Sadeghi, T. (2020). Comparing the effect of using normal saline and distilled water for tracheal suctioning on the incidence of ventilator-associated pneumonia and hemodynamic indexes in ventilator-dependent patients. *Journal of Clinical Nursing and Midwifery, 9*(2), 689-698.

Gaterega, T., Mwiseneza, M.-J., & Chironda, G. (2021). Nurses knowledge and practices regarding tracheostomy care at a selected referral hospital in Rwanda–a descriptive cross-sectional study. *International Journal of Africa Nursing Sciences, 15*, 100350.

Khanum, A., Gulzareen, M. O., Fizza, G., Buksh, F. M., & Nazir, S. (2023). Descriptive Study Evaluating Nurses Knowledge and Practices Regarding Tracheostomy Care in ICU Patients. *Pakistan Journal of Medical & Health Sciences, 17*(06), 134-134.

Kim, S. Y., Lee, S. W., Baek, A., & Park, K. N. (2023). Comparison between Real-Time Ultrasound-guided Percutaneous Dilatational Tracheostomy and Surgical Tracheostomy in critically ill Patients: A Randomized Controlled Trial. *Clinical and Experimental Otorhinolaryngology, 16*(4), 388.

Kolethekkat, A. A., Al Salmi, H. Z., Al Abri, H. K., & Al Abri, R. (2023). Insights on Competency and Knowledge Related to the Tracheostomy Care of Nurses at a Tertiary Referral Hospital in Oman. *Indian Journal of Otolaryngology and Head & Neck Surgery, 75*(2), 737-743.

Kriner, E. J. (2021). Perceived Benefits of Tracheostomy: Respiratory Mechanics and Asynchrony. In (Vol. 66, pp. 1501-1502): Respiratory Care.

Lubianca Neto, J. F., Castagno, O. C., & Schuster, A. K. (2022). Complications of tracheostomy in children: a systematic review. *Brazilian Journal of Otorhinolaryngology, 88*, 882-890.

McGrath, B. A., Wallace, S., Lynch, J., Bonvento, B., Coe, B., Owen, A., . . . Finch, T. L. (2020). Improving tracheostomy care in the United Kingdom: results of a guided quality improvement programme in 20 diverse hospitals. *British journal of anaesthesia, 125*(1), e119-e129.

Mosalli, R., Aboumoustafa, G. A., Khayyat, W., Bokhari, A. N., Almatrafi, M. A., Ghazi, M., & Paes, B. (2022). Assessment of Nurses' Knowledge and Confidence Regarding Tracheostomy Care in a Pediatric Long Term Care Hospital in Saudi Arabia. *Risk Management and Healthcare Policy*, 1809-1821.

Nabil Malk, R., Mawed Fahem, E., & Abouda Abdelhamed Soultan, A. (2022). Effectiveness of Training Program regarding Tracheostomy Care on Nurses Performance at Intensive Care Unit. *Egyptian Journal of Health Care, 13*(1), 267-279.

Nam, I.-C., Shin, Y. S., Jeong, W.-J., Park, M. W., Park, S. Y., Song, C. M., . . . Kang, C. H. (2020). Guidelines for tracheostomy from the Korean Bronchoesophagological Society. *Clinical and Experimental Otorhinolaryngology, 13*(4), 361-375.

Nasir, K. K. N. K. K., Mansoor, F. M. F., Waqar, S. H. W. S. H., Zahid, S. Z. A. K. S., Khan, A., & Jabeen, R. J. R. (2020). Percutaneous dilatational tracheostomy: A prospective analysis among ICU patients. *Journal of Rawalpindi Medical College, 24*(1).

Sangavi, A., Hariprasad, S., Ravikumar, R., & Suhas, Y. Timing of tracheostomy & its outcome in intensive care unit: A retrospective study. *Journal of Health Sciences, 6*(S3), 11034-11041.

Tembhare, V., & Singh, S. (2021). Effectiveness of protocol on endotracheal tube suctioning among ICU staff nurses. *Int J Cur Res Rev| Vol, 13*(08), 71.

Uluç, K., Öngel, E., İlkaya, N., Devran, Ö., & Özçelik, H. (2023). Indication, complication, and prognosis of fiberoptic bronchoscopy guided percutaneous dilatation tracheostomy opening in respiratory intensive care unit: a retrospective study. *European Review for Medical & Pharmacological Sciences, 27*(24).

Vimal Dass, M. (2022). *A Comprehensive study of Tracheostomy in ICU Patients and Correlation of Timing of the Procedure with Complications.* Madras Medical College, Chennai,

Yorschua Jalil, C., Villarroel, G., Barañao, P., Briceño, L., Andrés Lara, P., & Méndez, M. (2020). Pediatric tracheostomy tube change. *Rev Chil Pediatr, 91*(5), 691-696.