Health Needs and Problems of Patients with Permanent Tracheostomy

Bossy Rezk Abdou Barakat [1], Omima Mohamed Esmat [2], Asmaa Talaat Mohamed [3]
[1](B.Sc.N. 2002, Ain Shams University, Egypt).
[2](Assist. Prof. of Community Health Nursing, Faculty of Nursing,
Ain Shams University, Egypt).
[3](Lecturer of Community Health Nursing Department, Faculty of Nursing, Ain Shams University, Egypt).

Abstract

Background: A tracheostomy tube is an artificial airway, its an essential procedure for patients suffering from complications of acute or chronic respiratory failure, Individuals with tracheostomies are presented with a variety of functional, physical, and psychosocial challenges spanning from the point of insertion through hospital discharge to caring for the tracheostomy at home, and may face a range of daily physical challenges, from adjusting to swallowing and speaking, to dealing with the psychological aspects of their altered physical appearance. **Aim**: the study aims to assess health needs and problems of patient with permanent tracheostomy. **Design**: A descriptive correlational research design was utilized in this study. **Setting**: The study was conducted at surgical outpatient clinic at ElHelal and AlDemerdash Hospital, Cairo city- Egypt. **Subjects**: A purposive sample was used for conducting the study. **Data collection tools**: Interviewing- questionnaire sheet was used for the data collection which include four parts: Socio-demographic characteristics, tracheostomy patients' knowledge, practices, and patients' health needs and problems. **Results**: more than a half of patients them had unsatisfactory knowledge, while 63.3% of them had achieved satisfactory practice of care and, 40% of them had a moderate health need. **Conclusion**: this study concluded that more than half of patients had satisfactory level of knowledge and satisfactory level of practice, whereas near two thirds of them had moderate health needs. **Recommendations:** conduct training programs for patients, relatives and healthcare practitioners regarding effective permanent tracheostomy care.

Keywords: **Testicular Cancer, Awareness, & Testicular Self-Examination, Attitude.**

Introduction:

Tracheostomy is one of the earliest surgical procedures recorded, with illustrations depicting it as early as 3600 B.C. in ancient Egypt. A tracheostomy (or tracheotomy, while there are technical differences, these terms are colloquially used interchangeably. For the purposes of this article, we will use 'tracheostomy') is a surgical procedure to create an opening in the anterior trachea to facilitate respiration. Historically, a tracheostomy represented the only treatment available for upper airway obstruction, and this remains an important indication for tracheostomy today, though there are numerous others. A tracheostomy may be required in an emergent setting to bypass an obstructed airway, or (more commonly) may be placed electively to facilitate mechanical ventilation, to wean from a ventilator, or to allow more efficient management of secretions, among other reasons. Traditionally a tracheostomy is performed as an open surgical procedure ***(Al-Shathri & Susanto, 2018).***

Tracheostomy is one of the first recorded surgical procedures and refers to an artificial communication between the trachea and the anterior neck. It can be confused with laryngectomy, which refers to complete excision of the larynx, usually as treatment for laryngeal cancer, with the trachea terminating on the anterior neck. Patients with no connection from their upper airways (nose and mouth) to their lungs to relieve airway obstruction, the majority of tracheostomies are now performed in critically ill patients in order to facilitate weaning from prolonged mechanical ventilatory support. Other indications include offering a degree of protection against pulmonary aspiration, to aid clearance of respiratory secretions and to facilitate long-term invasive ventilation ***(Bonvento et al., 2017).***

Tracheostomy is a widely used intervention in patients with acute respiratory failure, especially when clinicians predict a patient's need for prolonged mechanical ventilation. This well-tolerated procedure reduces the requirement for sedation, results in better patient comfort, and facilitates earlier resumption of patient autonomy. On the other hand, tracheostomy carries risks of adverse events including procedure-related complications including death (albeit rare) and later cosmetic concerns. The use of this procedure has increased over the last decade, in part because of the introduction of a practical bedside percutaneous tracheostomy technique ***(Abe, T et al., 2018).***

A tracheostomy is a surgically created opening through the anterior neck tissues and the trachea, into which a tube is inserted. Tracheotomy is one of the oldest surgical procedures, the indications for which have changed and expanded over the 20th century. Traditionally used almost exclusively to bypass upper airway obstruction, it is now a common procedure performed as both a temporary and permanent measure for a variety of additional reasons, such as clearing bronchial secretions and providing mechanical ventilation. Advances such as percutaneous dilatational tracheostomy, a minimally invasive, alternative to surgical tracheostomy, which can be performed bedside, have added to the increased use of tracheostomy ***(Nakarada-Kordic, et al., 2018).***

Individuals with tracheostomies are presented with a variety of functional, physical, and psychosocial challenges spanning from the point of insertion through hospital discharge to caring for the tracheostomy at home. Due to its influence on basic human needs such as respiration, communication, and nutrition, the presence of a long-term tracheostomy will likely impact upon the psychosocial wellbeing and quality of life of the individual concerned. Adverse psychosocial impacts may arise due to the inherent disfigurement accompanying a tracheostomy. It is widely understood that acquired disfigurement presents unique psychological and social challenges and may profoundly impact upon an individual's life. The aim of this paper was to examine the current literature with the hope of gaining an understanding of the experiences of these individuals and their families and of identifying opportunities for improvement in their care ***(Freeman et al., 2016).***

Daily tracheostomy care is the same for temporary and permanent tracheostomy. Tubes, and is outlined in part 1 of this series. However, patients with a permanent tracheostomy need to be cared for by nurses who have the skills to teach them and their carers/relatives to be independent with tracheostomy care; many patients find this a daunting prospect. Patients with a permanent tracheostomy may be in hospital for months with complex health issues and often become dependent for physical and emotional support on nurses in the acute care setting. They may be anxious about the transition to their home environment, and it is important to start teaching them to care for their tracheostomy as soon as possible. This will help to reduce their length of stay in hospital and ensure they are, where possible, fully independent ***(Everitt, 2016).***

As many persons with tracheostomy are living at home, patients with permanent tracheostomy have special needs associated with their care to guarantee patient safety and well-being. Many patients are unprepared for the impact on their daily life that tracheostomy surgery will make. Individuals may face a range of daily physical challenges, from adjusting to swallowing and speaking, to dealing with the psychological aspects of their altered physical appearance. Some individuals suffer a negative economic impact because the demand of care needs in relation to the patient's tracheostomy and underlying condition may influence their ability to maintain employment ***(Wrapson et al., 2017).***

Good management of a patient with a tracheostomy, both in the hospital and in the community, has a significant impact on quality of life. Effective management by a community health nurse involves effective coordination of care, education of the patient and the family, attentive care, training to recognize and manage tube obstruction, confidence in changing the tracheostomy tube, knowledge of the tube characteristics (i.e. size, settings and function), and adequate access to advice and support ***(Zhu, et al., 2014).***

One of the primary responsibilities of nursing care is maintaining and evaluating airway patency in patients. Nurses' knowledge has vital

importance about the complications when providing airway patency with an artificial way via tracheostomy. Tracheostomy complications may occur in the weeks or months/years later following tracheostomy procedure. Nurses have responsibilities to follow-up of preventing complication after the tracheostomy procedure. Nursing care consists of infection prevention, suctioning, cleaning of the inner cannula, adequate and balanced nutrition, communication, and adjustment of cuff pressure ***(Karaca, 2015).***

Aim of the Study:

This study aims to assess health needs and problems of patient with permanent tracheostomy.

Research Questions: -

1. What is knowledge of patients with permanent tracheostomy related to tracheostomy?
2. What is practices of patients with permanent tracheostomy related to care of tracheostomy?
3. What is health needs and problems of life of patients with tracheostomy?
4. Is there a relation between socio-demographic characteristics of patients with permanent tracheostomy and their knowledge and practices?
5. Is there a relation between knowledge of patients with permanent tracheostomy and their health needs and problems?

Material And Methods

Research Design: A descriptive correlational design will be utilized to meet the aim of this study.

Study Location: The study will be conducted at the surgical outpatient clinic in Elhalal Hospital, and Aldemerdash hospital, Cairo, Egypt.

Study Subjects: The study subjects included a purposive sample will be used for conducting the study from mentioned setting.

Inclusion criteria.

- Adult patients with a permanent tracheostomy.
- Patients with permanent tracheostomy more than 3 months.
- Both sex.

Tools of Data Collection

Data for this study was collected by using the following tools.

Tool: Interviewing- questionnaire sheet: It will be developed by the researcher. It includes four parts as the following:

Part I: Socio-demographic characteristics of the studied patients such as age, sex, level of education, work status, etc).

Part II: Tracheostomy patients' knowledge related to tracheostomy that include (definition, causes, types, self-care, complications. etc.).

Scoring system:

- **Satisfactory >60%**
- **Unsatisfactory <60%**

Part III: Tracheostomy patients' practices related to care artificial airway.

Scoring system:

- **Achieved >60%**
- **Not Achieved <60%**

Part IV: health needs and problems (physical, psychological, mental and social).

Scoring system:

- **Low needs <50%**
- **Moderate needs 50-75%**
- **High needs >75%**

Face and Content Validity

Validity of the tools were done namely face validity and content validity. It was translated into Arabic and was tested by a jury group of five experts through an opinionnaire sheet to measure the validity of the tools.

Pilot Study

A pilot study was conducted on 10% of the study subjects. For testing clarity, applicability of the tools and to estimate the time required for fulfilling data collection tools. Based on the pilot study, no modifications were done, and the final version was prepared for distributing to the adult male.

Fieldwork

The researcher met study subject from Saturday and Tuesday 9:00 am to 12 pm regularly for 3\days a week for data collection. The researcher collected data by herself through meeting the study subjects and explaining the purpose of the study to them in the study settings.

Ethical considerations informal and legal consent

Prior study conduction, the research approval was obtained from the Scientific Research Ethical Committee in Faculty of Nursing, Ain Shams University. In addition, an approval was obtained

from the director of ElHelal and Aldemerdash Hospital either medical or nursing before starting the study. The researcher was assure anonymity and confidentiality of the study subject data and informed them about research purposes. All participants were informed about the study aim, process, and they were allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time. Ethics, values, culture, and beliefs was respected.

Statistical analysis

Recorded data were analyzed using the statistical package for social sciences, version 22.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage. The following tests were done ***Chi-square (x^2)*** test of significance was used in order to compare proportions between qualitative parameters, ***One-sample t-test*** was used to determine the significance of the difference between the average responses, ***Pearson's correlation coefficient (r)*** test was used to assess the degree of association between two sets of variables. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:, ***Probability (P-value)***

P-value ≤0.05 was considered significant.

P-value ≤0.001 was considered as highly significant.

P-value >0.05 was considered insignificant.

Cronbach's alpha coefficient was used to determine the reliability of the tool.

Results:

Table (1) Explains the studied patient's knowledge regarding to their permanent tracheostomy tube. It reveals that, (70%, 63.3% and 56.7%) were correct knowledge about the Definition of tracheostomy; Complications of laryngotomy & Importance of having a tracheostomy tube. On the other hand, (63.3%, 63.3% and 60%) were incorrect knowledge about Wound infection; Injury to some nerves & Needs of a permanent tracheostomy patient.

Figure (1) illustrates percentage distribution of the studied patients according to their knowledge about permanent tracheostomy tube, 46.7% of patients had satisfactory level, while 53.3% of them had unsatisfactory level.

Table (2) shows Number and percentage distribution of the studied patients practice according to their domain of caring for the incision tube, Illustrates that the studied patient's practice regarding caring for the incision tube. Shows that (60%, 63.3% and 66.7%) were achieved >60% of practice about caring for the incision tube.

Figure (2) Percentage distribution of the studied patients according to their health needs of patients with permanent tracheostomy. Illustrating that 33.3% of the studied patients have moderate needs for health needs, followed by 33.3% of them have low needs for health needs, while 26.7% of the studied patients have high needs for health needs.

Figure (3) Shows that, 40% of the studied patients have moderate problems for problems, followed by 33.3% of them have high problems, while 26.7% of the studied patients have low problems.

Table (3) Presented that, there were highly statistically significant correlation between total score of knowledge of the studied patients with permanent tracheostomy tube according to their total score of practice, total score of health needs, total score of problems.

Table (1): Number and percentage distribution of the studied patients according to their knowledge about permanent tracheostomy tube (N=30).

Items	Correct		Incorrect	
	No.	%	No.	%
Definition of tracheostomy	21	70.0	9	30.0
Reasons for the tracheostomy	15	50.0	15	50.0
Long is the tracheostomy tube	16	53.3	14	46.7
Importance of having a tracheostomy tube	17	56.7	13	43.3
Impact of the tracheostomy tube on daily life	14	46.7	16	53.3
Methods of caring for tracheostomy tube	13	43.3	17	56.7
Needs of a permanent tracheostomy patient	12	40.0	18	60.0
Complications of laryngotomy	19	63.3	11	36.7
Methods of the dealing with the complications of tracheostomy	12	40.0	18	60.0
Wound infection	11	36.7	19	63.3
Bleeding	14	46.7	16	53.3
Pain and difficulty breathing	13	43.3	17	56.7
Injury to some nerves	11	36.7	19	63.3
Ways to prevent complications from the tracheostomy tube	14	46.7	16	53.3

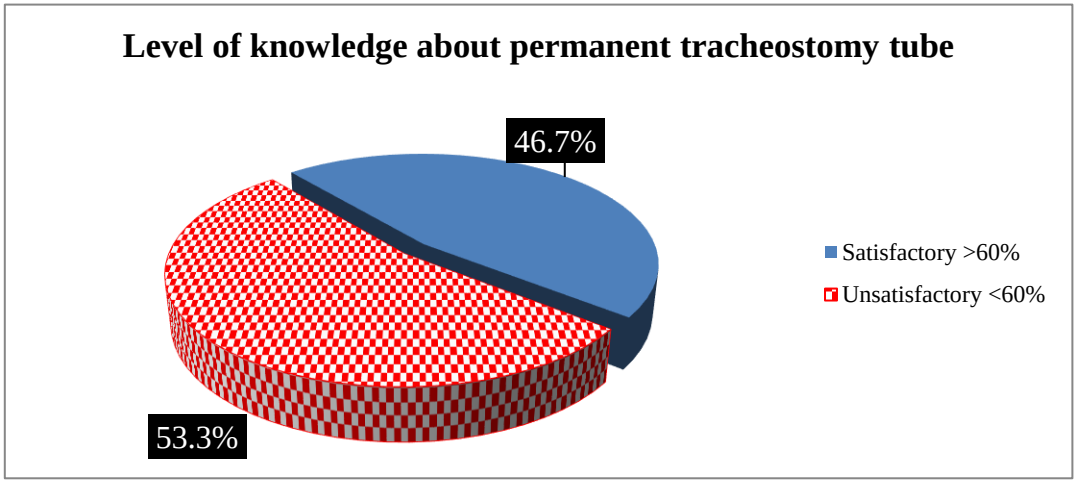


Fig. (1): Percentage distribution of the studied patients according to their knowledge about permanent tracheostomy tube.

Table (2): Number and percentage distribution of the studied patients practice according to their domain (N=30).

Domains	Achieved >60%		Not Achieved <60%	
	No.	%	No.	%
Skin care	18	60.0	12	40.0
Suctioning	19	63.3	11	36.7
Change the ligament of the tube of the throat (when dirt or wet)	20	66.7	10	33.3

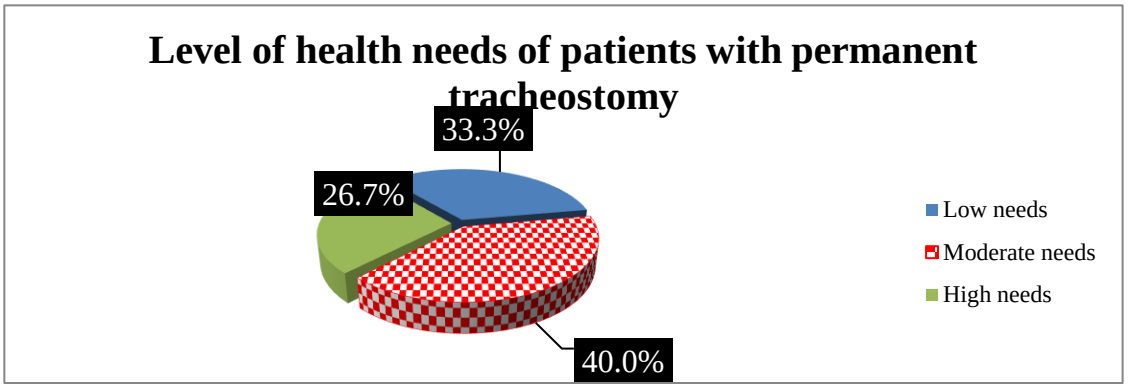
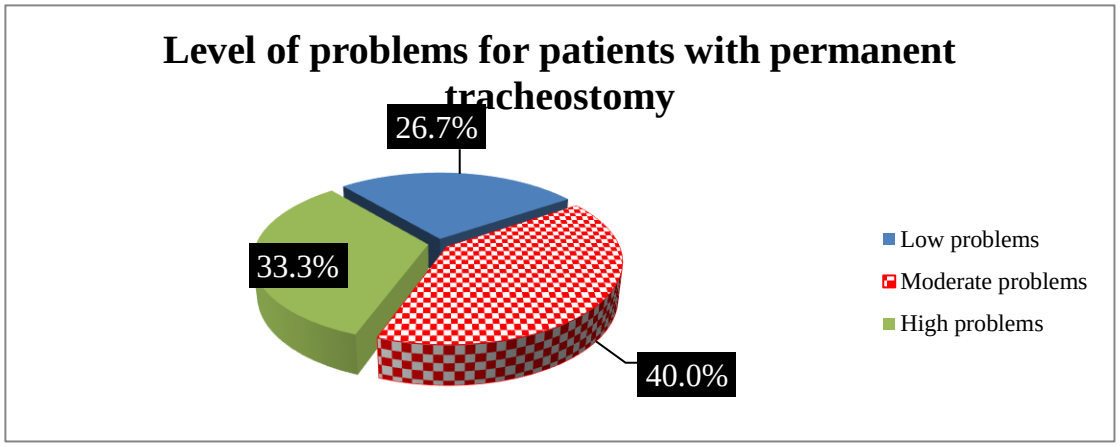


Fig. (2): Percentage distribution of the studied patients according to their health needs of patients



with permanent tracheostomy.

Fig. (3): Percentage distribution of the studied patients according to their problems for patients with permanent tracheostomy.

Table (3): Correlation matrix between total score of Knowledge, practice, health needs, problems and quality of life for patients with permanent tracheostomy.

		Total score of knowledge	Total score of practice	Total score of health needs	Total score of problems
Total score of knowledge	r		0.367	-0.213	-0.260
	p-value		<0.001**	0.035*	0.031*
	N		30	30	30
Total score of practice	r	0.367		-0.227	-0.274
	p-value	<0.001**		0.021*	0.017*
	N	30		30	30
Total score of health needs	r	-0.213	-0.227		0.208
	p-value	0.035*	0.021*		<0.001**
	N	30	30		30
Total score of problems	r	-0.260	-0.274	0.208	
	p-value	0.031*	0.017*	<0.001**	
	N	30	30	30	

Discussion:

Tracheostomy care requires a multidisciplinary approach, particularly involving nursing care and interventions. patients experience respiratory problems, such as coughing, excessive sputum, and lung infection. These problems have a negative effect on the quality of life (QoL) of tracheostomy patients ***(Bedwell et al., 2019).*** The current study aimed to assess health needs and problems of patient with permanent tracheostomy quality of life of patient with tracheostomy.

Patients with a tracheostomy are at risk for airway compromise and life-threatening complications secondary to mucus plugging, accidental decannulation, or bleeding ***(Mehta et al,.2019).*** The current study represents the knowledge about permanent tracheostomy tube as; slightly less than half of patients had satisfactory level of knowledge of permanent tracheostomy tube; meanwhile more than half of them had unsatisfactory knowledge. This may be due to patients have adequate level of knowledge regarding definition of tracheostomy and complications of laryngotomy. At the same time many patients have unsatisfactory knowledge regarding methods of the dealing with the complications of tracheostomy, wound infection, bleeding pain and difficulty breathing, injury to some nerves, and ways to prevent complications from the tracheostomy tube.

This result was in harmony with the result of ***Mehta et al., (2019)*** who stated that all the studies in the literature focus on some specific aspect of care, and those studies demonstrate a knowledge deficit. When they conduct a study that examines multiple aspects of permanent tracheostomy patient, the knowledge deficit significantly widens as evidenced by this study. Multiple studies have identified a problem ***(Onuoha, 2019; Queirós et al., 2021)*** however, there does not seem to be a widespread intervention to correct the knowledge gaps. Many patients do not process the diversity of knowledge needed to provide their care toward tracheotomy. Another study also supports the fact that patients' base future decisions on what they learned previously. However, the patients' knowledge regarding the importance of having a tracheostomy tube and complications of laryngotomy would occur but there is also a significant knowledge gap ***(McGrath et al., 2020).***

This result was inconsistent with the results of ***Kang et al., (2022).*** Who demonstrates the efficacy of a tracheostomy education program targeted to specific learners using a needs-based assessment. Significant improvement in mean objective knowledge scores was seen across all 3 specialty groups between pre- and postintervention assessments, indicating the short-term efficacy of the educational program. Although 6-month mean objective knowledge scores were relatively decreased from the postintervention period, they remained higher than the preintervention scores, suggesting the potential for retention.

Alotaibi et al. (2022) described that confidence is a critical aspect in the management of tracheostomized patients. Their results demonstrated that, almost half of the patients had no previous experience with tracheostomy-care, and many lacked confidences in managing their care. The need for educational programs and training to close gaps in knowledge is vital to achieve the optimal quality of care. Better knowledge has been observed among patients that invest in the implementation of educational content on tracheostomy care ***(Johnson et al., 2021).***

Sufficient knowledge of tracheostomy management and care is necessary, as it may translate into better responses in actual practice. As anticipated, the study also demonstrated that patients are more knowledgeable about the presentation of the indicators for displaced tracheostomy tubes or an accidental decannulation in the patient with an obstructed upper airway. However, when patients' knowledge is examined related to emergency management of the patient with a displaced tracheostomy or accidental decannulation, the patient with the unobstructed upper airway is more likely to survive the nurses' intervention ***(Altman et al., 2021).***

Unfortunately, there is no validated measure for tracheostomy knowledge assessment. In an effort to address this issue, questions were created using the clinical consensus statements as the basis for the topics covered and in conjunction with the involved specialty attending provider and otolaryngology faculty. Finally, there are additional challenges to sustainability of the program as it may not be

feasible to be directed by patients ***(Mahfoz, 2022).***

According to the demands of tracheostomy-related care, care givers interventions should be implemented from the preoperative to late post-operative period. In a study was conducted with the intention to assess the level and associated factors with knowledge and practice about tracheostomy. The study showed that the mean (±SD) knowledge score of study subjects was 12.71.(3.73±). Two hundred four (49.8%) study participants had good knowledge regarding tracheostomy. This study had demonstrated lower level of knowledge regarding tracheostomy. The prevalence of knowledge was lower compared to studies done in Pakistan and Saudi which were 60% and 77% respectively ***(Benscoter et al., 2019).***

This difference might be due to high illiteracy rate of the study participant, less devoted time with the patients by physicians, lack of organized tracheostomy education facilities and less participation of media. Two hundred eighteen (53.2 %) of the study participants thought that tracheostomy doesn't affect all part of the body and is characterized by raised blood sugar only. This study was supported by similar study in Pakistan and India which reported that 54 % and 57.8 % of participant didn't know what definition of tracheostomy ***(Shi et al., 2022).*** Similarly, another finding of this study was limited knowledge on complications related to tracheostomy. Knowledge about complications were 9.0% and 20.2% respectively. This was consistent with the study conducted 5% and 25% respectively ***(Alotaibi et al., 2022).*** However, this level of inadequate knowledge regarding risk factor and complication may lead to decrease precaution of patient for complication and these are high economic burden for the country in the management of complication which comes due to in adequate precaution for the complication.

Considering the effects and consequences that a tracheostomy has on a person's life, the person must receive appropriate education and counselling before and after surgery ***(Carroll-Alfano, 2019).*** The current represents the practice about caring for the incision tube. It displays that, more than two thirds of them had achieved practice about caring for the incision tube; meanwhile more than one third of them had not achieved satisfactory level of practice. Also, it showed that satisfactory level of practice regarding skin care, suctioning and change the ligament of the tube of the throat. This may be due to patients done some practices regarding hand washing and drying, check the skin and neck of any wounds or signs of infection, rinse the skin with a cotton piece wet with water in a circular motion in one direction and get rid of the cotton piece, and dry the skin in a circular motion from the inside out in one direction using dry dressing.

In a study conducted by ***Shah et al. (2020),*** they found that the majority (80%) of participants were median experience regarding practice of using non-sterile gloves, hydrogen peroxide, cotton swabs, disposable cannula, foam ties, and gauze dressings. The order of steps was variable with unique differences noted among all participants. The most common sequence was hand hygiene, clean flange, clean stoma, change inner cannula, change ties, and apply dressing. They discussed that research supported the belief that variation to technique and supplies does exist when performing tracheostomy care. Tracheostomy varied from provider to provider, demonstrating the need for further research and protocols for tracheostomy care. Education on existing protocols and evidence-based practice should be conducted to ensure that providers are following tracheostomy protocols.

Altman et al. (2021), stated that ongoing education may be necessary due to patients may not have the opportunity to practice their technical skills related to tracheostomy due to the relative infrequency of emergent events, they may need an interval ''refresher'' either through an online module or a regularly scheduled educational session. With regards to comfort level related to tracheostomy care, results demonstrated significant increases from pre- to postintervention assessment. More important, at the 6-month period, patients notably had significantly increased comfort levels relative to the preintervention period.

Although tracheostomy care has become a multidisciplinary effort, basic training on a specialty-specific level may provide a more substantial foundation on which to build as trainees may find more personal relevance when the tracheostomy emergency case scenario is presented in a way that they can easily picture

themselves as the first responder ***(Pu et al., 2022).***

Chauhan et al. (2020). described that information about the care of the tracheostomy tube. Majority (94%) of the patients were taught about tracheostomy tube care. They added that practices regarding care of tracheostomy tube. More than half (58%) of the participants were doing stoma care once a day. Almost half (42%) of the participants were using some antiseptic solution (dettol and savlon) for the care of stoma. In majority of the cases (96%) secretions removed through suctioning and only 4% use to cough to remove secretions. For one-third (31%) of the participants suctioning was done twice a day whereas 30% of the participants suctioning was done once a day. Majority (83%) of the participants' tracheostomy tube was changed by care givers. For One fourth (24%) of the participants' tracheostomy tube was changed after every 3 days. Three fourth (72%) of the participants were not using any solution for storage of tracheostomy tube. Majority (92%) of the participants were using a plastic container for storage of tracheostomy tube.

Tracheostomy is a common procedure for patients who require prolonged mechanical ventilation. There is very few evidence for best practices of performing tracheostomy care to maintain the airway and promote skin integrity. After tracheostomy, the patients may face many complications and problems. So, to reduce the chances of complications it is important to provide best care and to assess their practices of care for tracheostomy tube at home. It is essential that all the caregivers should have comprehensive and thorough training regarding proper care of the patients with tracheostomy ***(Lindquist, et al., 2020).***

Another study was conducted by ***McKeon, et al (2019).*** to develop the skills regarding tracheostomy suction among the caregivers and patients who were going to be discharged with tracheostomy tube. They recommended that the caregivers should be properly trained regarding changing the tracheostomy care in order to prevent any complication while performing the procedure. The caregivers need to learn the technique of change of tracheostomy care at home. Thy added that majority of the participants (94%) were taught about the tracheostomy care and nearly 80% were taught by nurses. Currently, no empirical evidence indicates a standardized time for changing a tracheostomy tube. They suggested that indications for changing a tracheostomy tube include the need for a different size tube, tube malfunction, need for a different type of tube, and prevention of infection.

Interestingly, in the previous study, there three fourth (72%) of the participants were not using any solution for cleaning of tracheostomy tube, 26% of the participants were making skin care by using dettol and savlon and only 2% were using plain water. Antiseptic solution should not be used for cleaning of tube because during insertion of tube the solution may cause irritation around the skin of stoma. The literature suggests that stoma should be cleaned every 4 to 8 hours. The skin should be inspected for any irritation or infection, such as erythema, pain, or dried secretions etc. Erythema often occurs because of the continued presence of moisture at the skin. Patients with copious secretions often require frequent dressing changes to keep the skin dry and prevent maceration of tissue and skin breakdown ***(Williams & McGrath, 2021).***

Dried secretions can be loosened with diluted hydrogen peroxide and then rinsed away with saline.25 In the present study, more than half (58%) of the participants were doing stoma care once a day and around half (42%) of the participants using the antiseptic solution (Dettol and savlon) for the cleaning of stoma. Antiseptic solution (dettol and savlon) should not be use for cleaning of stoma because it may cause irritation around the skin of stoma.

They concluded that most of the participants performed right practices for care of tracheostomy tube. These practices include cleaning of stoma, suctioning, changing of tracheostomy tube and storage of tracheostomy tube. Some of the participants performed wrong practices for care of tracheostomy tube which included use of antiseptic solution for cleaning of stoma, changing of tracheostomy tube after 10 or 15 days, using no solution and no container for the storage of tracheostomy tube. Hence, this is recommended that nurses and doctors should properly assess the tracheostomy care practices and teach the right practices to the patients and caregiver at the time of discharge from the health care settings.

The study findings of the current study explained that the studied patients of health needs among patients of tracheostomy tube, one

third of the studied patients have moderate needs for health needs, followed by another third of them have low needs for health needs, while slightly more than quarter of the studied patients have high needs for health needs. From the researcher point of view, this may be due to the differences in physical, social and financial needs of patients.

In a study conducted by ***Brooks et al (2020).*** They defined needs for tracheostomy patient. They described medical and technological needs. Experience suggests that patient and caregiver training should begin as early as possible and should be adjusted and individualized to the patient. When possible, training should be initiated in advance of the actual tracheostomy procedure. Both adult and pediatric patient training should include the patient and at least one caregiver, but preferably, two.

The details of appropriate patient training extend well beyond the scope of this overview, but at a minimum should include basic airway anatomy, medical justification for the tracheostomy, tube description and operation, signs and symptoms of respiratory and upper airway distress, signs and symptoms of aspiration, suctioning technique, tracheostomy tube cleaning and maintenance, stoma site assessment and cleaning, cardiopulmonary resuscitation, emergency decannulation and reinsertion procedures, tube change procedure (pediatrics), equipment and supply use and ordering procedures, and a scheduled follow-up plan with the attending physician.

Communication is one of the most important considerations and needs associated with the long-term management of patients with tracheostomies. Loss of effective communication can isolate adult patients and inhibit normal social and communication development in pediatrics. There are a number of tracheostomy adjuncts to promote speech, including cuffless tracheostomy tubes, fenestrated tracheostomy tubes, and one-way speaking valves. All tracheostomy patients should be referred for speech therapy prior to the surgical placement of the tracheostomy or soon thereafter ***(Kageyama et al., 2022).***

Stan et al. (2021) stated that thousands of tracheostomies are performed worldwide each year, which is a challenge for both the patient, his family and the medical staff ***(Nakarada-Kordic et al., 2018).*** Pre-and especially postoperative care of a patient undergoing tracheostomy involves a constant multidisciplinary effort sustained by specialists in many fields: ENT specialists, oncologists, radiotherapists, anesthetists, neurosurgeons, general surgeons, physiotherapists, speech therapists, nutritionists, therapists, social therapists but especially psychotherapists. Affecting the basic needs of the individual, tracheostomy involves the presence of a special management. Thus, the care of tracheostomy is one of the most suggestive examples of interdisciplinarity, requiring more medical teams, trained staff to provide continuous and effective care, starting from preoperative to home care or recovery centers. ***(Bonvento et al., 2017).***

The psychological well-being of the patient with tracheostomy is considered by researchers as important as the physical one. Tracheostomy has a special impact not only on the patient but also on their family or group of friends. Depending on the situation, informing the patient or their family about the tracheostomy is a real shock, and the feeling of joy and impatience experienced at discharge quickly turns into despair and misery.

Often the spouse or caregiver of the tracheostomized person seems overwhelmed by experiencing feelings of depression, feeling helpless, feelings of abandonment by other family members. sleep disorders, decreased social interactions, other times being forced to give up the profession in favor of the loved one who is so affected ***(Watchara & Kiwanuka, 2019).***

The current study showed that, 40% of the studied patients have moderate level problems, followed by 33.3% of them have high problems, while 26.7% of the studied patients have low problems. This may be due to the differences in social, psychological, and physical problems among patients.

The current study was in harmony with ***Zaga et al. (2020)*** who defined that patients who undergo total laryngectomy surgery experience certain problems during hospitalization and after discharge. These problems include the inability to speak, difficulty swallowing, decreased sensations of smell and taste, shortness of breath, increased cough and sputum, and impairment of body image and social relations. Patients with these difficulties have an increased need for information after discharge. ***Brenner, et al.***

(2020). Stated that the broad range of content of the discharge training provided to tracheostomy patients in another study (postoperative nutrition, swallowing exercises, cannula care, aspiration, bathing, dressing, and speech) appeared to decrease the problems experienced after discharge by better meeting the needs of the patients.

Hansen, et al (2021). investigated the problems encountered by 30 patients with tracheostomy after discharge and found that 42% experienced respiratory problems. Total laryngectomy eliminates the heating, humidification, and filtration of air by the nose, causing air to be sent directly to the lungs. The removal of the larynx also results in weakening of the neck muscles, making secretion difficult. As a result, patients are more prone to experience respiratory problems, such as shortness of breath, coughing, and sputum production. These respiratory problems were the most common issues experienced by both groups after discharge. The IG experienced lower rates of respiratory tract problems than the CG. The occurrence of shortness of breath on the 30th post discharge day was higher in the IG, but no patients reported shortness of breath on the 90th Post discharge day. This finding could be due to discharge training and the protective cover provided to the IG. The occurrence of cough and sputum on the 90th post discharge day was significantly higher in the CG than the IG.

Swords et al. (2021). concluded that Sixty-seven percent of patients experienced difficulty swallowing after total laryngectomy. Most of the patients in the CG an all the patients in the IG experienced difficulty swallowing on the 30th post discharge day, whereas some patients in the CG and none in the IG experienced difficulty on the 90th post discharge day. They believe the reason for this difference is that the IG patients received swallowing exercises as part of discharge training.

Tracheostomy care, a comprehensive nursing intervention, should be organized to involve education of the patients and their families. The current study represents that, 40% of the studied patients have average QOL, followed by 30% of them have low of QOL, while 30% of the studied patients have high QOL ***Smith et al .(2020).*** illustrates that there was no difference in the quality of life. However, these results should be cautiously interpreted, since there is a selection bias since only 34.6% of the patients included in this sub-study provided quality of life questionnaires during the follow-up. During post-critical care illness follow-up, a high number of patients are unfortunately lost in the process.

Mehta et al., (2019) stated that patients with a tracheostomy often find ways to cover the tracheal opening. Although no literature is available on this subject, patients have been observed closing the tracheal opening using a scarf, handkerchief, or surgical face mask. Because there is no medical material such as protective cover, the patients are forced to create their own stoma cover. Therefore, the purpose of this study was to investigate the effect of the use of a protective cover on the QoL of patients with a tracheostomy and the problems encountered following discharge after surgery.

In a monocentric study ***(Meister et al. (2021)***. evaluating the self-reported quality of life, 60% of patients could performed a complete follow-up. In another 2-year follow-up performed in a critical care pediatric population ***(Pandian et al., 2020),*** around 55% of children underwent complete neuropsychological assessment. This underlines the complexity of performing exhaustive follow-up after critical care illness. Tracheostomy results in a permanent disability with decreased functional capacity and psychological problems. Close monitoring of these patients and investing in maintaining continuity of care are essential to preserving their QoL ***(Goepfert et al., 2017).***

In spite of an excellent follow-up regarding the primary outcome, there quality of life assessment in the first year after ICU admission remains disappointing and implies a selection bias. Therefore, it is very difficult to assess the impact of tracheostomy on the quality of life in survivors with prolonged MV duration. There is a statistically significant imbalance in withdrawal of life-sustaining therapies (WLST) between both groups, which is of major importance regarding outcome. When excluding these patients, our sensitivity analysis showed the same trend of the relative effect of tracheostomy on outcome ***(McGrath et al., 2020).***

Glibbery et al., (2020). Defined current issues related to the tracheostomy care include

tracheostomy aspiration, cannula care, postoperative nutrition, speaking and swallowing, as well as the use of a protective cover that hides the stoma opening and acts as a barrier. The protective cover provides a barrier in front of the trachea and protects the lower respiratory tract from external factors. There are some reports in the literature that recommend using protective cover or device (stoma cloth, stoma cover, and heat moisture exchange device, etc) to improve pulmonary physiology and QoL of patients with tracheostomy.

Conclusion:

The current study concluded that more than half of patients with permanent tracheostomy had satisfactory level of knowledge and satisfactory level of practice, skin care, suctioning, and change the ligament of the tube of the throat. whereas nearly two thirds of them had moderate health needs. It was reported that there was highly statistically significant correlation between total score of knowledge of the studied patients with permanent tracheostomy tube according to their total score of practice, total score of health needs, total score of problems. Current study results revealed that there was significant correlation between patient educational level and their level of knowledge and practice. This may be related to the fact that the higher is the patient educational level, the higher level of knowledge patients have. In addition, both knowledge level and practice level are interrelated and depends on each other. These results are compatible with ***Kumar et al. (2020)*** who reported positive correlation between patient and family educational level and their level of knowledge and practice regarding care of tracheostomy. To the researcher knowledge limit, there is no findings that interfere with those results.

Regarding the residence place and its correlation with patient level of knowledge and practice. there is significant relation between place of residence and patient knowledge level and practice level. This may be related to the easier access to healthcare in urbans rather than the accessibility to healthcare in rural areas. This is in the same line with ***(Wells et al., 2018).*** On the other hand, ***Callans et al. (2016),*** reported that there was no correlation between place of residence and patient level of knowledge or practice regarding tracheostomy care.

Regarding patient needs and its correlation with patient sociodemographic data, there was significant correlation between patient needs and patient educational level. This may be related to the effect of educational level on the knowledge and practice of patient toward own selfcare. Demands and expectations of the patient. This result is compatible with results reported by (***McCormack et al., 2017)*** who reported negative correlation between level of education and patient care needs. On the other hand, (***Beom & Seo (2018),*** reported that there was no significant correlation between educational level and patient needs in post tracheostomy patient.

There was a highly statistically significant relation between level of problems for patients with permanent tracheostomy according to their educational level and income and it means that the higher level of education patients has low level of reported problems. This may be related to the effect of high level of education on patients knowledge and practice that directly affect the incidence of problems and the patient ability to overcome.

This result is on the same line with ***Liao et al. (2021)*** who reported significant correlation between level of education of patient and family caregiver and patient problems and indicated the negative correlation mentioned above. While ***Shay et al. (2018)*** reported no correlation between patient level of education and patient problems.

According to results revealed that there was a highly statistically significant relation between level of quality of life for patients with permanent tracheostomy according to their educational level and indicated that the patient quality of life varies according to their educational level. The higher educational level help patient achieves higher level of quality of life. While lower education level patients reported lower level of quality of life. This may be interpreted by the direct effect of educational level on patient knowledge, practice and needs fulfillment pf the patient.

This result is compatible with result reported by ***Pandian at al. (2020)*** who reported significant correlation between patient level of education and their quality-of-life level. On the other hand, to the best of the researcher's

knowledge there was no studies reported no relation between patient educational level and their quality of life after permanent tracheostomy insertion operation.

Findings of this study indicated that there was highly statistically significant correlation between total score of knowledge of the studied patients with permanent tracheostomy tube according to their total score of practice, total score of health needs, total score of problems & total score of quality of life. This may be interpreted by the overlapping between all items and the direct and indirect effect of knowledge on all of other variables.

Result of the current study is compatible with results reported from ***Varshney et al., 2017*** who reported significant correlation between patient level of knowledge and practice, health needs, problems & quality of life. On the other hand, ***Abe et al., 2018,*** reported that there was no relation between level of knowledge and quality of life and needs. Based on findings of this study, there was a highly statistically significant correlation between total score of practice of the studied patients with permanent tracheostomy tube according to their total score of health needs, total score of problems, total score of quality of life and knowledge level. This is on the same line with ***Pandian at al., 2020*** who reported the significant relation between patient level of practice and patient quality of life, patient needs, problems, and level of knowledge.

In addition, there were a highly statistically significant correlation between total score of health needs of the studied patients with permanent tracheostomy tube according to their total score of problems & total score of Quality of Life. Also, there were a highly statistically significant correlation between total score of problems of the studied patients with permanent tracheostomy tube according to their total score of Quality of Life. Finally, the results of this study clarified that the educational level, residence and income were independent predicators for high quality of life. This may be related to the effect of educational level, residence and income on all aspects of human life as knowledge level affect the practice of selfcare and income and residence affect the accessibility to healthcare and patient ability to care for self and seeking healthcare advice

Recommendations:

Based on the current study finding the following recommendations were proposed:

- Conduct training program for patients, relatives, and healthcare providers regarding permanent tracheostomy care.
- Formulate strategies to improve the quality of care of patients with tracheostomy and their caregivers.
- Implement surveys to serve as an indicator for prevalence of tracheostomy infection for improvement.
- Adoption of updated guidelines with heath care administrators and practitioners regarding permanent tracheostomy care.
- Conduct further studies in different settings and populations.
- Conduct further studies on factors affecting adaptation of patients with permanent tracheostomy.

References:

Abe, T., Madotto, F., Pham, T., Nagata, I., Uchida, M., Tamiya, N., ... & Laffey, J. G. (2018). Epidemiology and patterns of tracheostomy practice in patients with acute respiratory distress syndrome in ICUs across 50 countries. Critical care, 22(1), 1-16.

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.

Altman, K. W., Ha, T. A. N., Dorai, V. K., Mankidy, B. J., & Zhu, H. (2021). Tracheotomy timing and outcomes in the critically ill: complexity and opportunities for progress. *The Laryngoscope*, *131*(2), 282-287.

Bedwell, J. R., Pandian, V., Roberson, D. W., McGrath, B. A., Cameron, T. S., & Brenner, M. J. (2019). Multidisciplinary tracheostomy care: how collaboratives drive quality improvement. *Otolaryngologic clinics of North America*, *52*(1), 135-147.

Benscoter, D., Borschuk, A., Hart, C., & Voos, K. (2019). Preparing families to care for ventilated infants at home. In *Seminars in Fetal and Neonatal Medicine* (Vol. 24, No. 5, p. 101042). WB Saunders.

Beom, J. Y., & Seo, H. Y. (2018). The need for early tracheostomy in patients with traumatic cervical cord injury. *Clinics in Orthopedic Surgery*, *10*(2), 191-196.

Bonvento, B., Wallace, S., Lynch, J., Coe, B., & McGrath, B. A. (2017). Role of the multidisciplinary team in the care of the tracheostomy patient. *Journal of Multidisciplinary Healthcare*, *10*, 391–398.

Brenner, M. J., Pandian, V., Milliren, C. E., Graham, D. A., Zaga, C., Morris, L. L., ... & Roberson, D. W. (2020). Global Tracheostomy Collaborative: data-driven improvements in patient safety through multidisciplinary teamwork, standardisation, education, and patient partnership. *British journal of anaesthesia*, *125*(1), e104-e118.

Brooks, M., Jacobs, L., & Cazzell, M. (2022). Impact of emergency management in a simulated home environment for caregivers of children who are tracheostomy dependent. *Journal for Specialists in Pediatric Nursing*, *27*(2), e12366.

Callans, K. M., Bleiler, C., Flanagan, J., & Carroll, D. L. (2016). The transitional experience of family caring for their child with a tracheostomy. *Journal of Pediatric Nursing*, *31*(4), 397-403.

Carroll-Alfano, M. A. (2019). Education, counseling, support groups, and provider knowledge of total laryngectomy: The patient's perspective. *Journal of Communication Disorders*, *82*, Article 105938. https://doi.org/10.1016/j.jcomd is.2019.105938

Chauhan, N., Agnihotri, M., Kaur, S., & Panda, N. K. (2020). Practices regarding the care of tracheostomy tube in the patients with long term tracheostomy. *Nursing and Midwifery Research Journal*, *16*(2), 63-69.

Glibbery, N., Karamali, K., Walker, C., O'Connor, I. F., Fish, B., & Irune, E. (2020). Tracheostomy in the coronavirus disease 2019 patient: evaluating feasibility, challenges and early outcomes of the 14-day guidance. *The Journal of Laryngology & Otology*, *134*(8), 688-695.

Goepfert RP, Hutcheson KA, Lewin JS, et al. Complications, hospital length of stay, and readmission after total laryngectomy: total laryngectomy complications. Cancer. 2017;123:1760-1767.

Hansen, T. P., Noel-MacDonnell, J., Kuckelman, S., Norberg, M., Truog, W., & Manimtim, W. (2021). A multidisciplinary chronic lung disease team in a neonatal intensive care unit is associated with increased survival to discharge of infants with tracheostomy. *Journal of Perinatology*, *41*(8), 1963-1971.

Johnson, R. F., Brown, A., & Brooks, R. (2021). The family impact of having a child with a tracheostomy. *The Laryngoscope*, *131*(4), 911-915.

Kageyama, S., Takeishi, N., Taenaka, H., Yoshida, T., & Wada, S. (2022). Fluid dynamic assessment of positive end-expiratory pressure in a tracheostomy tube connector during respiration. *Medical & Biological Engineering & Computing*, *60*(10), 2981-2993.

Kang, H., Yi, K. S., Kim, S. H., Yang, B., Cho, J. Y., Choe, K. H., ... & Fiorelli, A. (2022). Multidisciplinary team approach on tracheoesophageal fistula in a patient with home ventilator. *Journal of Thoracic Disease*, *14*(10), 4143.

Kumar, V., Malhotra, V., & Sinha, V. (2020). Evaluation of Individual Quality of Life (QOL) Among Patients with Tracheostomy Using WHO-QOL BREF Questionnaire. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 1-10.

Liao, K., Chorney, S. R., Brown, A. B., Brooks, R. L., Sewell, A., Bailey, C., ... & Johnson, R. F. (2021). The impact of socioeconomic disadvantage on pediatric tracheostomy outcomes. *The Laryngoscope*, *131*(11), 2603-2609.

Lindquist, S. J., Morrison, S. E., & Iseli, C. E. (2020). Pediatric tracheostomy decannulation: post implementation of tracheostomy team and decannulation protocol. *Australian Journal of Otolaryngology*, *3*.

Mahfoz, T. M. B. (2022). Attitude and practices of tracheostomy care among nursing staff in Saudi Arabia. *BMC nursing*, *21*(1), 367.

McCormack, L., Thomas, V., Lewis, M. A., & Rudd, R. (2017). Improving low health literacy and patient engagement: A social ecological approach. *Patient education and counseling*, *100*(1), 8-13.

McGrath, B. A., Brenner, M. J., Warrillow, S. J., Pandian, V., Arora, A., Cameron, T. S., ... & Feller-Kopman, D. J. (2020). Tracheostomy in the COVID-19 era: global and multidisciplinary guidance. *The Lancet Respiratory Medicine*, *8*(7), 717-725.

McKeon, M., Kohn, J., Munhall, D., Wells, S., Blanchette, S., Santiago, R., ... & Watters, K. (2019). Association of a multidisciplinary care approach with the quality of care after pediatric tracheostomy. *JAMA Otolaryngology–Head & Neck Surgery*, *145*(11), 1035-1042.

Mehta, K., Schwartz, M., Falcone, T. E., & Kavanagh, K. R. (2019). Tracheostomy care education for the nonsurgical first responder: a needs-based assessment and quality improvement initiative. *OTO open*, *3*(2), 2473974X19844993.

Mehta, K., Schwartz, M., Falcone, T. E., & Kavanagh, K. R. (2019). Tracheostomy care education for the nonsurgical first responder: a needs-based assessment and quality improvement initiative. *OTO open*, *3*(2), 2473974X19844993.

Meister, K. D., Pandian, V., Hillel, A. T., Walsh, B. K., Brodsky, M. B., Balakrishnan, K., ... & Brenner, M. J. (2021). Multidisciplinary safety recommendations after tracheostomy during COVID-19 pandemic: state of the art review. *Otolaryngology–Head and Neck Surgery*, *164*(5), 984-1000.

Nakarada-Kordic, I., Patterson, N., Wrapson, J., & Reay, S. D. (2018). A systematic review of patient and caregiver experiences with a tracheostomy. Patient, 11(2), pp. 175–191.

Onuoha, J. (2019). *Developing an Educational Program for Tracheostomy Care* (Doctoral dissertation, Walden University).

Pandian, V., Cole, T., Kilonsky, D., Holden, K., Feller-Kopman, D. J., Brower, R., & Mirski, M. (2020). Voice-related quality of life increases with a talking tracheostomy tube: a randomized controlled trial. *The Laryngoscope*, *130*(5), 1249-1255.

Pandian, V., Morris, L. L., Brodsky, M. B., Lynch, J., Walsh, B., Rushton, C., ... & Brenner, M. J. (2020). Critical care guidance for tracheostomy care during the COVID-19 pandemic: a global, multidisciplinary approach. *American Journal of Critical Care*, *29*(6), e116-e127.

Pu, S. F., Boyle, J. V., Rubinstein, B. J., Bak, M. J., Brooke Hooper, A., & Mark, J. R. (2022). Video-Based Tracheostomy Care Education for Medical Students. *OTO open*, *6*(4), 2473974X221134267.

Queirós, S. M. M., Pinto, I. E. S., de Brito, M. A. C., & Santos, C. S. V. D. B. (2021). Nursing interventions for the promotion of tracheostomy self-care: A scoping review. *Journal of Clinical Nursing*, *30*(21-22), 3055-3071.

Shah, S. J., Cusumano, C., Ahmed, S., Ma, A., Jafri, F. N., & Yang, C. J. (2020). In situ simulation to assess pediatric tracheostomy care safety: a novel multicenter quality improvement program. *Otolaryngology–Head and Neck Surgery*, *163*(2), 250-258.

Shay, S., Shapiro, N. L., & Bhattacharyya, N. (2018). Revisits after pediatric tracheotomy: airway concerns result in returns. *International Journal of Pediatric Otorhinolaryngology*, *104*, 5-9.

Shi, J. Y., Orkin, J., Walsh, C. M., Chu, S., Keilty, K., McKay, S., ... & Amin, R. (2022). Pediatric Chronic Tracheostomy Care: An Evaluation of an Innovative Competency-Based Education Program for Community Health Care Providers. *Frontiers in Pediatrics*, *10*.

Smith, T. G., Ahmad, I., Takhar, A., Surda, P., & El-Boghdadly, K. (2020). Unconventional multidisciplinary team strategy for tracheostomy in COVID-19. *Anaesthesia reports*, *8*(2), 178.

Stan, D., Tuta, M. D., & Tatu, A. L. (2021). Psychosocial Implications of Patients with Tracheostomy-a Suggestive Example of Interdisciplinarity. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, *12*(2), 308-321.

Swords, C., Bergman, L., Wilson-Jeffers, R., Randall, D., Morris, L. L., Brenner, M. J., & Arora, A. (2021). Multidisciplinary tracheostomy quality improvement in the COVID-19 pandemic: building a global learning community. *Annals of Otology, Rhinology & Laryngology*, *130*(3), 262-272.

Varshney, S., Sharma, S. K., & Jelly, P. (2017). Tracheostomy suctioning: Exploration of knowledge and practices of nurses working in selected tertiary care hospitals in Uttarakhand state. *Nursing & Midwifery Research Journal*, *13*(2), 68-77.

Watchara, T., & Kiwanuka, F. (2019). Special article family caregivers for older adults with a tracheostomy during hospitalization: Psychological impacts and support. In International Journal of Caring Sciences, 12(2), 1244-1250. http://www.internationaljournalofcaringsciences.org/docs/75_1-tabootwong_special_12_2.pdf

Wells, S., Shermont, H., Hockman, G., Hamilton, S., Abecassis, L., Blanchette, S., & Munhall, D. (2018). Standardized Tracheostomy Education Across the Enterprise. *Journal of pediatric nursing*, *43*, 120–126.

Williams, T., & McGrath, B. A. (2021). Tracheostomy for COVID-19: evolving best practice. *Critical Care*, *25*(1), 1-9.

Zaga, C. J., Pandian, V., Brodsky, M. B., Wallace, S., Cameron, T. S., Chao, C., ... & Brenner, M. J. (2020). Speech-language pathology guidance for tracheostomy during the COVID-19 pandemic: an international multidisciplinary perspective. *American Journal of Speech-Language Pathology*, *29*(3), 1320-1334.