


TECHNOLOGICAL INNOVATION


Nursing care for patients with tracheostomy in mechanical ventilation: educational video

HIGHLIGHTS

1. Guide nursing teams from intensive care units.
2. Ensure good practices for patients with tracheostomy in mechanical ventilation.
3. Provide comfort and prevent assistance damage or complications.
4. Ensure continuous improvement of nursing care.

Denise de Fátima Ferreira Cardoso¹ 

Fernando Conceição de Lima¹ 

Elizabeth Teixeira¹ 

Elaine Regina Corrêa de Souza¹ 

Mary Elizabeth de Santana¹ 

Alzinei Simor¹ 

Anderson Lineu Siqueira dos Santos¹ 

ABSTRACT

Objective: To develop, based on the practice of nursing teams, an educational video on caring for patients with tracheostomy in mechanical ventilation. **Method:** Methodological study conducted from December 2022 to November 2023 in 3 stages: literature review, exploratory study with descriptive analysis of data obtained by questionnaires from 38 professionals from five Intensive Therapy Centers of a Center of High Complexity in Oncology in Belém, Pará, Brazil. Development of educational video-technology. **Results:** Six topics emerged from the review. The exploratory study revealed nine themes. The seven-minute and 12-scene video was developed in the Celtx® program on daily care with tracheostomy, appropriate aspiration technique, moisturization, skin evaluation, curatives, and identification of emergencies and complications. **Conclusion:** The educational video can assist nursing teams in intensive therapy units in ensuring good practices for patients with tracheostomy in mechanical ventilation. **KEYWORDS:** Tracheostomy; Nursing Care; Intensive Care Units; Educational Technology; Education Continuing.

HOW TO REFERENCE THIS ARTICLE:

Cardoso DFF, de Lima FC, Teixeira E, de Souza ERC, de Santana ME, Simor A, et al. Nursing care for patients with tracheostomy in mechanical ventilation: educational video. Cogitare Enferm [Internet]. 2025 [cited "insert year, month and day"];30:e98935. Available from: <https://doi.org/10.1590/ce.v30i0.98935>

INTRODUCTION

The Intensive Care Units (ICU) offer high-specific care to severe patients. Many suffer from the inability to spontaneously breathe, requiring invasive mechanical ventilation (IMV), which may be facilitated by the use of an orotracheal tube (OTT) or tracheostomy cannula (TCS)¹.

The indications for TCS can be of two types: emergency, when the patient is suffering from respiratory failure, obstructive frames in the upper airways, fractures in the bone structure of the face, laryngeal lesions caused by trauma or burns, and elective: recommended when there is difficulty in the process of orotracheal intubation (OTI), to assist in ventilatory sweating, and to facilitate the aspiration of large quantities of tracheobronchic secretions, such as in the case of neurological pathologies².

According to the Hospitalization System/Datasus database records, between 2011 and 2020, about 172.456 TCS preparations occurred in young adult patients aged over 20 years, cost by the Unified Health System (SUS) across the national territory. In addition, in Brazil, the main causes associated with TCS are respiratory and oncological conditions³.

Because it is a surgical procedure widely used as a result of prolonged IMV, TCS offers significant advantages over OTI, but its management requires specialized attention, as its preparation can cause infectious complications, manifested by flogistic signs such as hyperemia, edema, heat and drainage of purulent aspect secretion, but also postoperative such as lesions due to attachment with chest, accidental decanulation of TCS, obstructions by blood clots or secretions and/or air escape due to insufficient sealage of the area.⁴

The correlation between TCS and IMV projected a scenario where nursing excellence is crucial for optimizing clinical outcomes and promoting patient care quality⁵. Given this, developing technologies aimed at the care of the TCS critical user in VMs enhances the participation of nursing professionals and engagement in micro and macro sectorial actions of health institutions, in addition to ensuring the conduct of a care line for TCS users⁶.

In this context, it is necessary to expand and update the knowledge of nursing teams regarding such care, as it is recommended that the actions related to managing patients with TCS submitted to IMV are constantly updated⁷. Given the complexity of intensive care for patients with TCS in IMV, it is necessary to avoid complications and maintain the necessary ventilatory process to ensure evidence-based assistance with integrity and resolution to the user with TCS⁸.

Concerning continuing health education, the emergence of innovative strategies to qualify the care processes of nursing professionals⁶ is highlighted. In this sense, developing an audiovisual technological product can enable the dissemination of evidence about specific nursing care needed for patients with TCS and interactively promote such dissemination to catalyze positive changes in the provision of care⁹.

Thus, the study aimed to develop an educational video on caring for patients with tracheostomy in mechanical ventilation.

METHOD

It is a methodological study, elaboration of educational technology, conducted in December 2022 and November 2023, developed in three stages in an adapted form¹⁰: literature review, exploratory study, and development of educational technology of the type video. To ensure methodological rigor, the guidelines of the Revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) were adopted.

In the first stage, an integrative review in seven phases¹¹ was developed to answer the question: What is the scientific evidence about nursing patients with TCS in mechanical ventilation? Original articles published between 2013 and 2023 in Portuguese and Spanish were adopted as inclusion criteria. Duplicate studies that did not answer the research question were excluded. Combinations were defined using Boolean descriptors and operators to model the search strategies from the perspective of retrieving more primary articles in the electronic databases and portals described in Chart 1 below.

Chart 1. Boolean databases, electronic portals, descriptors, and operators. Belém, Pará, Brazil, 2024

| Databases | Electronic Portals | Descriptors | Boolean operators |
|---|---|---|---|
| <ul style="list-style-type: none"> Latin American Caribbean in Health Sciences (LILACS); Database of Nursing (BDENF); Medical Literature Analysis and Retrieval System Online (MEDLINE) via PubMed Central® (PMC); Web of Science (WOS) | <ul style="list-style-type: none"> Scientific Electronic Library Online (SciELO) | <ul style="list-style-type: none"> "Traqueostomia"; "Tracheostomy"; "Traqueostomía", "Cuidados de enfermagem"; "Nursing care"; "Atención de enfermería", "Unidade de terapia intensiva"; "Intensive care units"; "Unidades de cuidados intensivos" | <ul style="list-style-type: none"> AND OR |

Source: The authors (2024).

After the search, we used the revision manager software Rayyan Qatar Computing Research Institute (Rayyan QCRI). In addition, we followed recommendations from the instrument Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)¹². The synthesized results were recorded on the *Figshare*® platform at the link: <https://doi.org/10.6084/m9.figshare.24716448>.

In the second stage, an exploratory, quantitative study was conducted in five Intensive Therapy Centers (CTIs) of a Center for High Complexity in Oncology (CACON) in Belém, Pará, Brazil to subsidize the development of the video. Data collection took

place from August to October 2023. Participated in the study 11 nurses and 30 nursing technicians, working in the morning and afternoon shifts, with effective, temporary or provision of services; excluded were those who were away by licenses and attestations, three participants refused to answer the questionnaire items, resulting in a final sample of 10 nurses and 28 nursing technicians who after invitation and voluntary acceptance, signed a free and informed consent term (TCLE).

A questionnaire developed by the researchers was applied, with nine questions in two blocks: characterization of the professional profile (professional category; bond; time of performance; training); questions on: interest in updating specific nursing care for patients with TCS in IMV, relevance of a technology on the subject; training related to the topic; video duration, care of interest in the topic. The obtained items were organized into spreadsheets and submitted to the descriptive analysis of the data in the software *Microsoft Office Excel®*.

In the third stage, the proposal for constructing audiovisual products was followed¹³ in three phases: pre-production, production, and post-production. In the pre-production stage, content organization and action planning were carried out. For this, the detailed script was idealized with the help of the Celtx® program, and the storyboard, i.e., the visualization of the representation of the scenes described in the script, was done with the help of a videomaker with expertise in the production of videos and animations. The scenes of nursing care for patients with TCS in IMV were assembled during the production. The contents were based on the results of previous stages. The scenes were composed using 2D and 3D animations, audio narration of the content, and text information through the programs *Adobe Photoshop®* and *Adobe After Effects®*. In post-production, image edits and audio additions were applied with the *Adobe Premiere®* program.

The project was approved by Ophir Loyola Hospital's Ethics Committee in Human Research (CEP) (Opinion 6.041.330).

RESULTS

In the integrative review, we obtained a sample of 15 articles. From the summary of the evidence about nursing care for patients with TCS in IMV, six topics stand out: suitable aspiration techniques, maintenance, moisturization, skin evaluation, curatives, and identification of emergencies and complications.

The exploratory study involved 38 professionals: 10 nurses (26.42%) and 28 nursing technicians (73.68%). The profile characterization highlighted the role, ties, time of performance, and academic degree of the nurses (Table 1).

Regarding nursing care for patients with TCS, 16 (42.10%) never participated in training and updating, but all (100%) consider such action important; as to the time arising from the last training action about TCS care in IMV, of the 22 who had already participated, six (06) nurses participated between six (06) months and one (01) year and among nursing technicians, four (04) participated six (06) months ago, nine (09) between six (06) months and one (01) year and one (01) more than five (05) years.

Table 1. Profile data of participants. Belém, Pará, Brazil, 2024

| Characterization | n | % |
|--------------------------------|----|-------|
| Function | - | - |
| Nurse | 10 | 26.42 |
| Nursing Technician | 28 | 73.68 |
| Bond | - | - |
| Has another bond | 24 | 63.00 |
| Nurses | 6 | 25.00 |
| Nursing Technicians | 18 | 75.00 |
| has no other bond | 14 | 37.00 |
| Nurses | 4 | 40.00 |
| Nursing Technician | 10 | 35.71 |
| Operating time in ICU | - | - |
| 1-3 years | 3 | 7.90 |
| 4 years or more | 35 | 92.10 |
| Nurses | - | - |
| 1-3 years | 1 | 10.00 |
| 4 years or more | 9 | 90.00 |
| Nursing Technicians | - | - |
| 1-3 years | 2 | 7.14 |
| 4 years or more | 26 | 92.85 |
| Nurses' academic degree | - | - |
| Postgraduate (lato sensu) | 6 | 66.6 |
| Master (stricto sensu) | 3 | 33.33 |
| Doctorate (stricto sensu) | 0 | 0 |
| has no specialization | 1 | 0.01 |

Note: (n=38)
Source: The authors (2024).

On videos about nursing care to patients with TCS in IMV, 35 (92%) considered it as a strategy of maximum relevance, and three (3) (8.00%) considered it as having moderate relevance. Regarding the video length, 24 (65.69%) indicated “up to 10 minutes” as appropriate. Regarding the actions to compose the educational video, the greatest interest was in the practices of daily care with TCS; handling of the *cuff*; care with tracheal aspiration, evaluation of the skin periestome, curative in TCS; systematization of nursing assistance: nursing diagnoses in the care of patient with TCS in IMV and identification of emergencies and complications (Table 2).

Table 2. Actions for educational video. Belém, Pará, Brazil, 2024

| (continue) | | | |
|------------|--|--------------------------------|--------|
| Itens | Description of the action | How many times it was selected | % |
| Item 1 | Presentation of TCS types and components | 38 | 100.00 |
| Item 2 | Daily Care Practices with TCS | 38 | 100.00 |
| Item 3 | Cuff handling | 38 | 100.00 |
| Item 4 | Care with tracheal aspiration | 38 | 100.00 |
| Item 5 | Mobilization of respiratory secretions | 17 | 44.73 |
| Item 6 | Communication with the patient with TCS | 32 | 84.21 |

Table 2. Actions for educational video. Belém, Pará, Brazil, 2024

(conclusion)

| Itens | Description of the action | How many times it was selected | % |
|---------------|---|--------------------------------|--------|
| Item 7 | Evaluation of peristome skin and curatives in TCS | 38 | 100.00 |
| Item 8 | Systematization of nursing care: Nursing diagnoses in patient care with TCS | 38 | 100.00 |
| Item 9 | Identification of emergencies and complications in critical patients with TCS | 38 | 100.00 |

Source: The authors (2024).

Twelve scenes were structured in the video production, creation, and assembly, addressing nursing care for patients with TCS in IMV; each scene prioritizes an item addressed in the evidence synthesis and the participants' indications (Chart 2).

Chart 2. According to the literature and the participants' indications, scenes and items make up the video. Belém, Pará, Brazil, 2024

(continue)

| Review article number | Item addressed in the video scene | Justification according to literature | Indications of participants |
|-----------------------|--|--|---|
| 1,2,3 and 4 | Oral hygiene with chlorhexidine digluconate at 0.12% every 12 hours. | Effective for chemical control in removing bacterial plaque in the oral cavity, especially if combined with a soft toothbrush, and useful in reducing the incidence of pneumonia associated with IMV. | "Practices of daily care for patients with TCS in IMV". n=38 (100%) |
| 1 and 4 | Frequency of tracheal aspiration by clinical evaluation of the patient | Clinical signs that may suggest the need for aspiration: adventistic noises or decreased vesicular murmur associated with dyspnea, use of auxiliary musculature, secretion in the TCS, reduction in oxygen saturation (SPO2) < 92%, denaturation of the flow curve in the mechanical respirator. | "Care practices with tracheal aspiration". n=38 (100%) |
| 5 and 6 | Humanized, accessible, welcoming communication strategies to identify patient needs. | Beneficial to the patient and nurse, enables the user to understand and participate in the care decision-making process, reducing discomfort and isolation. | "Practices of daily care for patients with TCS in IMV". n=38 (100%) |
| 7 | Use of heat and humidity exchanger (HME) type humidifiers for humidification. | HME filters allow heat and moisture filtration, reduce aerosol exposure for healthcare professionals, facilitate verbal communication and reduce the risk of pneumonia ²⁵ | "Practices of daily care for patients with TCS in IMV" n=38 (100%) |
| 8, 9 and 10 | Daily inspection of the skin around the TCS and recording signs of infection, maceration and irritation. | The presence of inflammation and drainage of purulent secretion may indicate infection in the peristome region, which should remain clean and dry. Change fixation whenever there is visible dirt ^{26, 27, 28} | "Evaluation of skin peristome and carrying out curative" n=38 (100%) |

Chart 2. According to the literature and the participants' indications, scenes and items make up the video. Belém, Pará, Brazil, 2024

(continue)

| Review article number | Item addressed in the video scene | Justification according to literature | Indications of participants |
|----------------------------|---|---|---|
| 8 and 9 | Implement TCS curative with 0.9% saline solution or chlorhexidine at least once a day. | The 0.9% physiological solution is indicated for daily curative TCS. Aqueous chlorhexidine can be used when there are phlogistic signs in the stoma; however, daily use is not recommended. | "Evaluation of peristome skin and curative performance". N=38 (100%) |
| 9 | Use of half-folded whole gases or foam plates and hydrophilic covers for lateral stoma protection. | Prevents flies from loosening the cut gas and penetrating the trachea causing complications. Foam plates allow for moisture absorption in excessive secretions. | "Evaluation of peristome skin and curative performance". n=38 (100%) |
| 1, 6 and 10 | Maintain the cuff pressure at 20-25mmHg/ 20-30cmH ₂ O with the cuff-meter, at least once per turn. | Ideal pressure levels are 20-25mmHg to minimize air leaks. If it exceeds 25 mmHg, it may indicate that the canula has an inadequate size, and it is possible to generate stenosis and ischemia. The cuff-meter is reliable for pressure measurement. | "Cuff handling". n=38 (100%) |
| 1, 6, 8, 10, 11, 12 and 13 | <p>In the aspiration of secretions do not use 0.9% physiological solution directly in the canula.</p> <p>The pressure of the aspiration probe should be between 100 and 120 mmHg to avoid injuring the tracheal mucosa.</p> <p>The diameter of the probe shall not exceed half the internal diameter of the TCS canula;</p> | <p>The use of saline solution is not beneficial, which may be related to the decrease in oxygen saturation, agitation, and increased volume of secretions.</p> <p>Low aspiration pressures are ineffective in extracting secretions and excessive pressures can cause damage to the tracheal mucosa.</p> <p>The proper size of the probe reduces the risk of tracheal trauma and hypoxia.</p> | <p>"Care in the aspiration of secretions."</p> <p>n=38 (100%)</p> |

Chart 2. According to the literature and the participants' indications, scenes and items make up the video. Belém, Pará, Brazil, 2024 (conclusion)

| Review article number | Item addressed in the video scene | Justification according to literature | Indications of participants |
|-----------------------|---|---|---|
| 4 | <p>Nursing Diagnostics: Impaired gas exchange; ineffective respiratory pattern;</p> <p>Impaired spontaneous ventilation; ineffective desobstruction of the airways; impaired skin integrity; impaired verbal communication; risk of aspiration and infection.</p> | <p>Associated factors: changes in ventilation-infusion and level of consciousness;</p> <p>Fatigue of the accessory muscles;</p> <p>Bronchial secretion;</p> <p>Inference in circulation in the peristome region.</p> <p>Presence of TCS canula.</p> <p>Decrease in cough reflex and impaired swallowing.</p> <p>Invasive procedure, increased exposure to pathogens, organic fluid stasis.</p> | <p>"Nursing diagnoses to patient with TCS in IMV".</p> <p>n=38 (100%)</p> |
| 6, 11 and 14 | <p>Incorrect positioning of the TCS canula;</p> <p>Oclusion of the lumen of the canula by secretions;</p> <p>Air escape due to inadequate sealing;</p> <p>Cough;</p> <p>Bronchospiration;</p> <p>Peristome skin bleeding.</p> | <p>Signs of probe obstruction: changes in oxygen saturation, difficulty breathing and cough.</p> <p>The ideal cuff pressure should be < 25 cmH20 to avoid air leaks.</p> <p>The peristome skin should be clean and dry.</p> <p>Need for humidification to prevent secretions from becoming thick.</p> <p>Changes in the pulmonary auscultation and secretion in the canula are indications for aspiration.</p> <p>Proper hydration can prevent thickening of secretions.</p> | <p>"Identification of complications".</p> <p>n=38 (100%)</p> |

Source: The authors (2024).

The educational video produced, consisting of the 12 scenes, highlights in each scene the nursing care of patients with TCS in IMV, highlighting the goal, the nursing diagnoses, and the care to be performed (Figure 1). The video was finalized in *full-HD*, 1920 x 1080 px resolution, MP3 audio, has a duration of seven minutes and will undergo the processes of evaluation of content, appearance and semantics, in addition to being submitted to usability analysis in subsequent stages, following the guidelines of the continuity projects aimed at technological development studies¹⁴, ensuring the quality of the information presented for dissemination. It is available at the link: <https://vimeo.com/1038390335>.



Figure 1. Illustrative image of educational video scenes. Belém, Pará, Brazil, 2024

Source: The authors (2024).

DISCUSSION

The results highlighted weaknesses regarding continuous education actions with nursing professionals regarding care for patients with TCS in IMV. The absence of such actions can negatively impact the quality of care, as the complexity of the management of TCS in IMV requires specialized knowledge and specific skills¹⁵. Similar findings report the greatest difficulties faced by nursing professionals in relation to the care of the user with TCS in mechanical ventilation (MV) that were focused on the identification of emergencies and complications related to TCS, communication with the user and exchange of the TCS tube⁶.

In the exploratory stage, all participants indicated that they were favorable to developing an educational video on TCS-related care, which reinforces the adoption of this strategy modality in actions of permanent education⁹. From this perspective, audiovisual approach tools enable professionals to have broader access to information that favors the improvement of skills¹⁶, in addition to being considered a co-factor in educational processes¹⁰.

The professionals also indicated a preference for videos with a duration of up to 10 minutes, highlighting the preference for content presented in a concise and direct manner, which is in line with their intense routine; such a time option makes educational videos not exhausting and unattractive to the viewer because if they extended for more than fifteen minutes, the duration could discourage their use¹⁷.

As for the care inserted in the scenes of the educational video, the content of the items was based on the synthesis of the evidence carried out in the review stage. In the consulted literature, it was confirmed that it was recommended to use chlorhexidine digluconate every 12 hours at a concentration of 0.12% since it is useful in the decontamination of the oral cavity and is related to the decrease in the incidence of pneumonia cases associated with IMV¹⁸. In addition, in the intervals between applications, oral hygiene should be continued using distilled or filtered water as prescribed by the institution¹⁴.

The daily inspection of the skin around the tracheostomy was evidenced to not only contribute to the identification of infections but also helps in the overall assessment of

the integrity of the skin and in the prevention of ulcers¹⁹. In addition, it is essential to check for changes such as hyperemia, secretions, and bleeding²⁰.

In a study¹⁴, nurses achieved good adherence to the frequency of the curative change, which should be twice a day or when the curative appears wet, as the peristome skin needs to be kept clean and dry. Therefore, through the clinical evaluation of the nurse, the curative can be done with physiological solution, placement of folded gases on the sides, as well as hydrophilic coverings and foam plates, as they are effective in absorbing moisture and reduce the occurrence of pressure injury related to TCS²⁰.

The humidification of the TCS canula plays an important role in daily respiratory care, as it helps to make the secretions less thick, influences the amount produced, and facilitates the removal by aspiration. This can avoid obstruction in the TCS canula²¹, since with the presence of an artificial airway, the air does not penetrate through the nasal mucosa, which exercises the function of humidifying and warming it.

Thus, viscous and dense secretions can hinder the passage of air, compromising ventilation and increasing the risk of complications such as the formation of mucous tampons. In this sense, it is recommended to use heat and moisture exchanger filters (HME), which are efficient in preventing obstruction in the TCS cannula²².

On the procedure of aspiration of tracheal secretions, this should be performed based on the clinical evaluation of the user, and signs such as: changes in the pulmonary auscultation, modification of peripheral saturation, discarded other causes, observation of changes in flow curves in the mechanical respirator monitor, evidence of visible secretions²³⁻²⁴. In addition, the time spent on each introduction of the aspiration probe must be short, up to 15 seconds, as they reduce the incidence of possible hemodynamic alterations, hypoxia, and lesions in the tracheal walls²⁵.

There is no consensus among the authors regarding aspiration pressure. However, it is indicated that it should be low to avoid tracheal lesions and hypoxia, with values between 80-120/150 mmHg²⁴. In addition, regarding the use of physiological serum directly in the TCS cannula, authors consider this use to be unfavourable in reducing the viscosity of the secretion and reiterate that it can cause a reduction in the oxygen saturation levels²⁵.

The TCS cannula cuff plays a crucial role in the proper management of the airway. When inflated, it seals the area between the cannula and the tracheal wall to prevent air passage to the external environment, thus keeping the airflow direction controlled during breathing²⁶. However, it is necessary to monitor the pressure regularly, which should be kept in the range of 20-25mmHg or 20-30cmH₂O. It should be evaluated with the cuff-meter at least once per turn to avoid complications such as ischemia and stenosis²⁷.

The communication of the nursing team with the patient with TCS in IMV, in turn, allows them to know and meet emotional and physical demands by enabling the expression of their doubts, feelings, and needs of the user; he structures experiences that will assist him physically and mentally in the course of his treatment²⁸. Therefore, providing creative resources for the patient's verbal and nonverbal communication process is interesting in strengthening the patient's bond and communication with the nursing team²⁹.

Knowledge about the identification and monitoring of complications arising from the confection of TCS by the nursing team is essential for the nursing team's

management to be started as soon as possible. This includes replacing the cannula, antibiotic therapy, using hydrophilic covers with microbial property and adhesion, and using fixers with Velcro³⁰.

As limitations of the study, we point out that it was conducted in only one institution, which does not have the permanent education service, which can generate different needs in relation to nursing professionals who have this type of service available; in addition, the validation of content and appearance was not carried out, which will be considered in a later study.

CONCLUSION

An educational video was developed to guide nursing teams in intensive care units and ensure good practices for patients with tracheostomy in mechanical ventilation.

It reaffirms the complexity of nursing care needed for patients with TCS in MV to provide comfort and prevent injuries and complications. It highlights the importance of considering the experiences of professionals, their desires, needs, knowledge, and skills in technology development studies.

The educational video can contribute to strengthening autonomy, agility, and safety in decision-making and clinical practice, resulting in continuous improvement of nursing care management in the intensive care scenario for patients with TCS in MV.

REFERENCES

1. Alves RMS, Ribeiro RC. Intensive care and the different meanings of vulnerability. *Crit Care Sci* [Internet]. 2023 [cited 2024 Jan 16];35(1):102-6. Available from: <https://doi.org/10.5935/2965-2774.20230317-en>
2. Khaja M, Haider A, Alapati A, Qureshi ZA, Yapor L. Percutaneous tracheostomy: a bedside procedure. *Cureus* [Internet]. 2022 [cited 2024 Jan 16];14(4):e24083. Available from: <https://doi.org/10.7759/cureus.24083>
3. Nazario LC, Magajewski FRL, Pizzol ND, Saloti MHS, Medeiros LK. Temporal trend of tracheostomy in patients hospitalized in the Brazilian National Unified Health System from 2011 to 2020. *Rev Col Bras Cir* [Internet]. 2022 [cited 2023 Dec 5];49:e20223373. Available from: <https://doi.org/10.1590/0100-6991e-20223373>
4. Khanum T, Zia S, Khan T, Kamal S, Khoso MN, Alvi J, et al. Assessment of knowledge regarding tracheostomy care and management of early complications among healthcare professionals. *Braz J Otorhinolaryngol* [Internet]. 2022 [cited 2023 Dec 5];88(2):251-6. Available from: <https://doi.org/10.1016/j.bjorl.2021.06.011>
5. Spito A, Cavaliere B. A Therapeutic Education Program for patients that underwent at temporary tracheotomy and total laryngectomy: leading to improved the "Diagnostic, Therapeutic and Assistance Path". *Acta Biomed* [Internet]. 2019 [cited 2024 May 28];90(11-S):38-52. Available from: <https://doi.org/10.23750/abm.v90i11-S.8849>
6. de Lima FC, Neves WFS, Dias ALL, Mendes CP, Simor A, Pimentel IMS, et al. Nursing care protocol for critical users with tracheostomy under mechanical ventilation. *Rev Bras Enferm* [Internet]. 2024 [cited 2024 May 28];77(2):e20230337. Available form: <https://doi.org/10.1590/0034-7167-2023-0337>

7. Branco A, Lourençone EMS, Monteiro AB, Fonseca JP, Blatt CR, Caregnato RCA. Education to prevent ventilator-associated pneumonia in intensive care unit. *Rev Bras Enferm* [Internet]. 2020 [cited 2024 Jan 5];73(6):e20190477. Available from <https://doi.org/10.1590/0034-7167-2019-0477>
8. de Lima FC, de Oliveira RF, Pantoja SNP, Reis KBS, Pinto GJMC, Botelho MNG, et al. Cuidados de enfermagem como gestão de qualidade ao usuário com traqueostomia-revisão integrativa. *Res Soc Dev* [Internet]. 2022 [cited 2023 Dec 8];11(17):e212111739071. Available from: <http://dx.doi.org/10.33448/rsd-v11i17.39071>
9. Swords C, Manji A, Ward E, Arora A. A pilot study on the provision of tracheostomy healthcare and patient engagement in quality improvement measures: a global perspective. *J Laryngol Otol* [Internet]. 2018 [cited 2023 Dec 8];132(12):1093-6. Available from: <https://doi.org/10.1017/S0022215118002177>
10. Moreira BCB, de Lima FC, da Silva CO, de Carvalho DS, Simor A, de Santana ME, et al. Educational video for self-care of patients with intestinal elimination stoma. *Cogitare Enferm* [Internet]. 2023 [cited 2023 Nov. 25];28:e90832. Available from: <https://dx.doi.org/10.1590/ce.v28i0.90832>
11. Melnyk BM, Fineout-Overholt E, Stillwell SB, Williamson KM. Evidence-based practice: step by step: the seven steps of evidence-based practice. *Am J Nurs* [Internet]. 2010 [cited 2024 Mar 13];110(1):51-3. Available from: https://journals.lww.com/ajnonline/fulltext/2010/01000/evidence_based_practice_step_by_step_the_seven.30.aspx doi: 10.1097/01.NAJ.0000366056.06605.d2
12. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann T, Mulrow CD, et al. Mapping of reporting guidance for systematic reviews and meta-analyses generated a comprehensive item bank for future reporting guidelines. *J Clin Epidemiol* [Internet]. 2020 [cited 2024 Feb 14];118:60-8. Available from: <https://doi.org/10.1016/j.jclinepi.2019.11.010>
13. Kindem GA; Musburger RB. introduction to media production: the path to digital media production. New York: Focal Press; 2012. 4th ed. 504p.
14. Teixeira E, Nascimento MHM. Continuity projects: a possibility for the implementation of technological solutions [editorial]. *Online Braz J Nurs* [Internet] 2023 [cited 2024 Dec 14];22:e20236604. Available from: <https://doi.org/10.17665/1676-4285.20236604>
15. Oliveira AMB, de Souza LEC, Martins FLPSP, Brasil RP, Pereira ABN, Carvalho MMC, et al. Educational action in routine care of cancer patients with a metal tracheostomy cannula. *Res Soc Dev* 2020 [cited 2024 Feb 14];9(12):e16991210963. Available from: <https://doi.org/10.33448/rsd-v9i12.10963>
16. Interaminense INCS, de Oliveira SC, Linhares FMP, Guedes TG, Ramos VP, Pontes CM. Construction and validation of an educational video for human papillomavirus vaccination. *Rev Bras Enferm* [Internet]. 2020 [cited 2024 Apr 24];73(4):e20180900. Available from: <https://doi.org/10.1590/0034-7167-2018-0900>
17. Dantas DC, Góes FGB, dos Santos AST, da Silva ACSS, Silva MA, da Silva LF. Production and validation of educational video to encourage breastfeeding. *Rev Gaúcha Enferm* [Internet]. 2022 [cited 2024 Apr 24];43:e20210247. Available from: <https://doi.org/10.1590/1983-1447.2022.20210247.en>
18. Shi Z, Xie H, Wang P, Wu Y, Worthington HV, Singer M, et al. Oral hygiene care for critically ill patients to prevent ventilator associated pneumonia. *Cochrane Database Syst Rev* [Internet]. 2020 [cited 2023 Dec 14];(2):CD008367. Available from: <https://doi.org/10.1002/14651858.CD008367>
19. Bontempo LJ, Manning SL. Tracheostomy emergencies. *Emerg Med Clin N Am* [Internet]. 2019 [cited 2023 Nov 18];37(1):109-19. Available from: <https://doi.org/10.1016/j.emc.2018.09.010>
20. Moser CH, Peeler A, Long R, Schoneboom B, Budhathoki C, Pelosi PP, et al. Prevention of tracheostomy-related pressure injury: a systematic review and meta-analysis. *Am J Crit Care* [Internet]. 2022 [cited 2024 Jan 24];31(6):499-507. Available from: <https://doi.org/10.4037/ajcc2022659>
21. de Oliveira BC, Guimarães AEV, Carrias FMS, Silva HGN, Oliveira SSM, da Silva VMB, et al. Aquecimento e umidificação dos gases inspirados na ventilação mecânica e sua relação com a secreção. *ConScientiae Saúde* [Internet]. 2019 [cited 2024 Jan 24];18(2):191-8. Available from: <https://doi.org/10.33448/rsd-v18i02.191-8>

[org/10.5585/ConsSaude.v18n2.10985](https://doi.org/10.5585/ConsSaude.v18n2.10985)

22. Ebersole B, Moran K, Gou J, Ridge J, Schiech L, Liu JC, et al. Heat and moisture exchanger cassettes: results of a quality/safety initiative to reduce postoperative mucus plugging after total laryngectomy. *Head Neck* [Internet]. 2020 [cited 2023 Nov 17];42(9):2453-59. Available form: <https://doi.org/10.1002/hed.26267>
23. Monnerat MS, de Paula VG, da Fonseca CTM, de Almeida LF, Assad LG. Good practices in endotracheal aspiration in an intensive care unit: observational study. *Rev Baiana Enferm* [Internet]. 2023 [cited 2024 May 28];37:e52988. Available form: <https://doi.org/10.18471/rbe.v37.52988>
24. Dias DM, Oliveira SRS, da Silva GO, Gonçalves DP, de Oliveira B, Oliveira PHS, et al. Possible complications due to performing tracheal aspiration in critically ill patients: literature review. *Rev Soc Dev* [Internet]. 2022 [cited 2024 Dec 19];11(17):e20111738866. Available from: <https://doi.org/10.33448/rsd-v11i17.38866>
25. Cordeiro ALPC, Nascimento JSG, de Oliveira JLG, Alves MG, Braga FTMM, Dalri MCB. Artificial airway aspiration after the 2010 guideline: what has changed? *Rev Eletrônica Acervo Enferm* [Internet]. 2021 [cited 2024 Dec 19];14:e8995. Available from: <https://doi.org/10.25248/reaenf.e8995.2021>
26. Choi HR, Kim S, Kim H-J, Ahn EJ, Kim KW, Bang SR. Endotracheal tube cuff pressure increases in patients undergoing shoulder arthroscopy: a single cohort study. *Rev Bras Anestesiol* [Internet]. 2020 [cited 2024 Feb 9];70(6):583-7. Available form: <https://doi.org/10.1016/j.bjane.2020.11.002>
27. Alotaibi FZ, Alkhatabi R, Allowaihiq L, Alhazzani H, Alshehri G, Hajr EA, et al. Assessment of the ability, perception, and readiness of nurses to manage tracheostomy-related complications in Riyadh City: a cross-sectional study. *BMC Nurs* [Internet]. 2022 [cited 2023 Oct 28];21:320. Available from: <https://doi.org/10.1186/s12912-022-01101-y>
28. de Queiroz NMS, de Lima FHG, Leite DMC, França MO, Gondim AA. O som do silêncio: vivência de pacientes traqueostomizados. *Rev Contemp* [Internet]. 2023 [cited 2023 Oct 28];3(7):8413-29. Available form: <https://doi.org/10.56083/RCV3N7-055>
29. Pandian V, Hopkins BS, Yang CJ, Ward E, Sperry ED, Khalil O, et al. Amplifying patient voices amid pandemic: perspectives on tracheostomy care, communication, and connection. *Am J Otolaryngol* [Internet]. 2022 [cited 2023 Oct 29];43(5):103525. Available from: <http://doi.org/10.1016/j.amjoto.2022.103525>
30. Baker LR, Chorney SR. Reducing pediatric tracheostomy wound complications: an evidence-based literature review. *Adv Skin Wound Care* [Internet]. 2020 [cited 2023 Oct 28];33(6):324-8. Available form: <https://doi.org/10.1097/01.ASW.0000661808.51766.9aorg/10.5585/ConsSaude.v18n2.10985>
22. Ebersole B, Moran K, Gou J, Ridge J, Schiech L, Liu JC, et al. Heat and moisture exchanger cassettes: results of a quality/safety initiative to reduce postoperative mucus plugging after total laryngectomy. *Head Neck* [Internet]. 2020 [cited 2023 Nov 17];42(9):2453-59. Available form: <https://doi.org/10.1002/hed.26267>
23. Monnerat MS, de Paula VG, da Fonseca CTM, de Almeida LF, Assad LG. Good practices in endotracheal aspiration in an intensive care unit: observational study. *Rev Baiana Enferm* [Internet]. 2023 [cited 2024 May 28];37:e52988. Available form: <https://doi.org/10.18471/rbe.v37.52988>
24. Dias DM, Oliveira SRS, da Silva GO, Gonçalves DP, de Oliveira B, Oliveira PHS, et al. Possible complications due to performing tracheal aspiration in critically ill patients: literature review. *Rev Soc Dev* [Internet]. 2022 [cited 2024 Dec 19];11(17):e20111738866. Available from: <https://doi.org/10.33448/rsd-v11i17.38866>
25. Cordeiro ALPC, Nascimento JSG, de Oliveira JLG, Alves MG, Braga FTMM, Dalri MCB. Artificial airway aspiration after the 2010 guideline: what has changed? *Rev Eletrônica Acervo Enferm* [Internet]. 2021 [cited 2024 Dec 19];14:e8995. Available from: <https://doi.org/10.25248/reaenf.e8995.2021>

26. Choi HR, Kim S, Kim H-J, Ahn EJ, Kim KW, Bang SR. Endotracheal tube cuff pressure increases in patients undergoing shoulder arthroscopy: a single cohort study. *Rev Bras Anesthesiol* [Internet]. 2020 [cited 2024 Feb 9];70(6):583-7. Available from: <https://doi.org/10.1016/j.bjane.2020.11.002>
27. Alotaibi FZ, Alkhatabi R, Allowaihiq L, Alhazzani H, Alshehri G, Hajr EA, et al. Assessment of the ability, perception, and readiness of nurses to manage tracheostomy-related complications in Riyadh City: a cross-sectional study. *BMC Nurs* [Internet]. 2022 [cited 2023 Oct 28];21:320. Available from: <https://doi.org/10.1186/s12912-022-01101-y>
28. de Queiroz NMS, de Lima FHG, Leite DMC, França MO, Gondim AA. O som do silêncio: vivência de pacientes traqueostomizados. *Rev Contemp* [Internet]. 2023 [cited 2023 Oct 28];3(7):8413-29. Available from: <https://doi.org/10.56083/RCV3N7-055>
29. Pandian V, Hopkins BS, Yang CJ, Ward E, Sperry ED, Khalil O, et al. Amplifying patient voices amid pandemic: perspectives on tracheostomy care, communication, and connection. *Am J Otolaryngol* [Internet]. 2022 [cited 2023 Oct 29];43(5):103525. Available from: <http://doi.org/10.1016/j.amjoto.2022.103525>
30. Baker LR, Chorney SR. Reducing pediatric tracheostomy wound complications: an evidence-based literature review. *Adv Skin Wound Care* [Internet]. 2020 [cited 2023 Oct 28];33(6):324-8. Available from: <https://doi.org/10.1097/01.ASW.0000661808.51766.9a>

Received: 02/06/2024

Approved: 27/01/2025

Associate editor: Dra. Luciana de Alcantara Nogueira

Corresponding author:

Denise de Fátima Ferreira Cardoso

Universidade do Estado do Pará

Avenida José Bonifácio, 1289 – Guamá, Belém – PA

E-mail: deniseffcardoso@gmail.com

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Cardoso DFF, de Lima FC, Teixeira E, de Souza ERC, Simor A, dos Santos ALS**; Drafting the work or revising it critically for important intellectual content - **Cardoso DFF, de Lima FC, Teixeira E, de Santana ME, Simor A**; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Cardoso DFF, de Lima FC, dos Santos ALS**. All authors approved the final version of the text.

ISSN 2176-9133



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).