

Original Article

Investigation on Brazilian physiotherapists experiences and practice on palliative extubation

Investigação sobre as experiências e a prática de fisioterapeutas brasileiros em extubação paliativa.

Ana Paula Ragonete dos Anjos Agostini¹, Juliano Ferreira Arcuri², Fabiana Della Via¹, Lorryne Camila Lima¹, Luana Carolina Aquino¹, Carolina Kosour¹

1. Universidade Federal de Alfenas (UNIFAL), Alfenas, MG, Brasil.
2. Centro Universitário Nossa Senhora do Patrocínio (UNICEUSNP), Brasil.

ABSTRACT

Introduction: Mechanical-ventilation withdraw and endotracheal tube removal controversies are responsible for some difficulties surrounding these procedures in patients receiving palliative care. The aim of this study is to identify experiences, perceptions and practices of Brazilian physiotherapists regarding palliative extubation. **Method:** Prospective mixed methods study, with two moments, an online survey followed by semi-structured interviews. Professional profile, and practice prior, during and after palliative extubation. The variables were distributed in frequencies and described in percentages. **Results:** 54 physiotherapists answered the interviews, and 17 were excluded. The associated factors with palliative extubations were prognosis (94%), quality-of-life after intensive care unit (86%). The physiotherapy procedures used prior to extubation were endotracheal suctioning (95%), oral suctioning (97%), cuff deflation (100%). Most used mechanical-ventilation parameters were FiO₂ 21%, PEEP 5cmH₂O and PS 7cmH₂O (51%). The decisions after extubation were not administrate oxygen or other respiratory support (35%) and using 1-4L/min oxygen (22%). The most common complication was dyspnea (64%). **Conclusion:** Brazilian physiotherapists participate in palliative extubation. Symptom control and respiratory comfort were the priority When deciding for do not administrate oxygen or other ventilatory support after extubation.

Keywords: Respiratory physiotherapy. Palliative care. Tracheal extubation.

Corresponding author: Fabiana Della Via – fabianadv@yahoo.com.br.

Conflict of Interest: The authors declare no conflict of interest.

Submitted on: 01/30/2025 | Accepted on: 06/22/2025 | Published on: 07/18/2025

DOI: 10.36517/rfsf.v12i1.95154

INTRODUCTION

Palliative extubation is a procedure aiming to decrease suffering of patients under mechanical ventilation and their families, especially in intensive care units (ICU)¹⁻⁵. This procedure prevents prolonging suffering and shall be an agreement between health professional team and the patient or its family, so bereavement process may begin early⁵. Palliative extubation is the removal of the artificial airway (i.e. endotracheal tube) and mechanical ventilation support of patients in the end of life facing an irreversible illness. This procedure is a part of the transition to comfort oriented care when it has been determined that more aggressive health care may be incapable to achieve the desired goals⁶.

The controversial aspects regarding mechanical ventilation withdraw and endotracheal tube removal brings some difficulties about this procedure. The defense of endotracheal tube removal is based in the fact that it is potentially uncomfortable, artificial, and the symbol it represents as an invasive life support measure, which makes families express the desire for the tube removal. On the other hand, tube removal may lead to upper airways obstruction, problematic and audible respiratory secretions, known as death rattle. This is the reason some authors prefer ventilatory support discontinuation without the removal of endotracheal tube⁸.

Although there is literature regarding the ethical and legal aspects of life-sustaining measures and mechanical ventilation, less information is available with guidance for the health professional regarding the details of conducting ventilator and endotracheal tube removal process. Even less information is available regarding the role of the respiratory physiotherapist during palliative extubation⁹.

However, in Brazil, extubation process is primarily conducted by physiotherapists after an agreement of the multi-professional team, and is yet to know which has been their role and knowledge regarding palliative extubation, the controversies regarding this process, and their involvement in shared decision making. Therefore, the aim of this study was to investigate the experiences and practices of physiotherapists during palliative extubation.

METHOD

Study design

This was a prospective mixed-methods study, including a survey and semi-structured interviews to obtain information regarding the experiences and practices of Brazilian physiotherapists on palliative extubation. The present study was approved by the institutional ethics committee (CAAE:57155122.5.0000.5142). Participants were recruited by mail using a list of physiotherapists of two Brazilian professional associations and all included individuals electronically signed the consent form. Recruitment period was between May and December of 2022. The following inclusion criteria were followed (1) Brazilian physiotherapists; (2) professionals with palliative care experience. Participants who had never participated in a palliative extubation were excluded from the study.

Sociodemographic, educational information and professional experience with palliative care extubation were collected using a standardized instrument with structured questions, including age, sex, literacy, professional specialty, years working in ICUs, place of work and presence on palliative care extubation procedures. An electronic form (Google Forms) was constructed by the authors with 17 questions, which is available for readers in the supplementary file.

The semi-structured interview was constructed based in the theme of the research and was conducted by the same assessors, previously trained and not directly involved in the conception of the study (Figure 1).

The interviews were conducted in participants of the survey who previously agreed to be contacted. Moreover, the choice for whom would be contacted was made with an electronically random sequence. The interviews were recorded using a voice recording app (*iTop Screen Recorder*, ©*iTop* -). The anonymity of the data was assured using identification codes and data were protected using password and cryptography. The speech were transcribed literally and analyzed by content analysis method, classified in themes. The analysis was conducted in three steps (1) pre-analysis, with a complete reading of the transcripts, definition of core answers and line-by-line transcription. An (2) material exploration followed this procedure, with a choice of text fragments for the establishment of themes. Finally (3) the treatment of the results was done, with inferences and interpretation. The sample size was determined using data saturation. When there was no new information being collected and all potential sources of answer variations were explored in participants interviews.

Quantitative data was analyzed using descriptive statistics, including proportion measures. Authentic citations were used as examples and support of the identified themes, and their choice were discussed among researchers until a consensus was reached.

RESULTS

Three hundred and seventeen physiotherapists were invited to participate in the study, and fifty-four accepted and were included. Seventeen participants were excluded since they have never participated in a palliative extubation procedure. Thirty-seven participants were in the analysis. Most of them were women (72,9%), only one participant was not specialized in intensive care or palliative care, and 54% of them were trained in palliative care.

Survey results

Almost a half of the participants (45%) performed palliative extubation once every six months. Among professionals with PC training, the frequency of performing palliative extubation once every six months reached 55%, which was higher than professionals without PC training, which was 35%. When physiotherapists were questioned about their confidence in performing palliative extubation, a total of 91.9% affirmed feeling confident. Both training reported having confidence and a positive feeling (91,9%) when performing palliative extubation. These data are described in Table 1.

Palliative extubation decision associated factors were prognosis (94.5%), followed by quality of life after ICU and comorbidities (86.4%), family members' wishes (83.7%) and patient's wishes (78.3%). When asked about whose patients were referred to palliative care in their place-of-work, the physiotherapists responded internal medicine (91.8%), oncology (89.1%) and surgical patients (35.1%).

Most of the physiotherapists (70.2%) reported they participate in multidisciplinary team meetings and family conferences for palliative extubation decision-making. Less professionals (65%) affirmed their participation in decision-making meetings in PC trained group, compared to 76% of professionals without PC training. The data is outlined in Table 2.

Just prior to extubation, physiotherapists reported they performed endotracheal suctioning (94.5%), oral suctioning (97.2%), MV parameters reduction (81%), cuff deflation (100%), and a semi-recumbent positioning (94.5%). Professionals with PC training perform less suction (90%) compared to those without training (100%). Professionals without PC training reported using manual chest physiotherapy techniques (41.1%), a higher value than the found for professionals with PC training (30%).

Professionals with PC training reported they frequently did not implement oxygen therapy after palliative extubation, which was similar to professionals without PC training (41%). Other responses indicated that post-extubation approaches are applied based on the patients' ventilatory needs, immediate hypoxemia, and that there is no pre-established protocol.

The main complications experienced by physiotherapists after palliative extubation include dyspnea (64.8%), death rattle (72.9%), and laryngeal stridor (59.4%). Other reported complications included oxygen desaturation, acute respiratory failure, moaning, gasping, bleeding, apnea, immediate cyanosis, sensory impairment, and bronchospasm. The data is outlined in Table 3.

Table 1. Demographic profile of the physiotherapists who responded this survey.

Survey question	Total sample Responses (%) N=37	Without PC training n=17 (%)	With PC training N=20 (%)
Age (years)			
20-30	3 (8.1)	1 (5.8)	2 (10)
30-40	16 (43.2)	8 (47)	8 (40)
40-50	14 (37.8)	6 (35.2)	8 (40)
50-60	4 (10.8)	2 (11.7)	2 (10)
60-70	0	0	0
Gender			
Female	27 (72.9)	12 (70.5)	15 (75)
Male	10 (27.1)	5 (29.5)	5 (25)
Experience as physiotherapists (years)			
0 - 5	0	0	0
5 - 10	8 (21.6)	5 (29.4)	3 (15)
10 - 20	18 (48.6)	8 (47)	10 (50)
20 - 30	8 (21.6)	3 (17.6)	5 (25)
30 - 40	3 (8.2)	1 (6)	2 (10)
Post-graduate training			
Specialization	35 (94.5)	16 (94.4)	19 (95)

			Table 1 (Continued)
Residence	13 (35.1)	3 (17.6)	10 (50)
Masters	14 (37.8)	8 (47)	6 (30)
PhD	6 (16.2)	4 (23.5)	2 (10)
Post-doctorate	0	0	0
Employment Hospital			
Public	26 (70.2)	12 (70.5)	14 (70)
Non-profit private	3 (8.1)	1 (6)	2 (10)
Profit private	8 (21.7)	4 (23.5)	4 (20)
Experience working in ICU			
0-5	11 (29.7)	4 (22.6)	7 (35)
5-10	4 (10.8)	2 (11.7)	2 (10)
10-20	16 (43.3)	8 (47)	8 (40)
20-30	5 (13.5)	2 (11.7)	3 (15)
30-40	1(2.7)	1 (6)	0
Hospital beds destined to palliative care			
Yes			
No	10 (27.1)	4 (23.5)	6 (30)
	27 (72.9)	13(76.5)	14 (70)
Frequency of performing palliative extubation			
Annually			
Every six-months	9 (24.3)	5 (29.4)	4 (20)
Every month	17 (45.9)	6 (35.3)	11 (55)
Weekly	10 (27)	5 (29.4)	5 (25)
Daily	1 (2.8)	1 (5.9)	0
	0	0	0
Confidence and positive feelings when performing a palliative extubation			
Yes	34 (91.9)	16 (94.1)	18 (90)
No	3 (8.1)	1 (5.9)	2 (10)

Legend: ICU: Intensive Care Unit; n: sample size; PC: Palliative Care, %: percentage.

Table 2. Physiotherapists responses regarding palliative extubation decision-making.

	Total sample (%) N=37	Without PC training n=17(%)	With PC training N=20(%)
Palliative extubation - Decision-making associated factors			
Age			
Comorbidities	17 (45.9)	7 (35)	10 (58.9)
Previous quality of life	32 (86.4)	13 (5)	19 (58.9)
Expected quality of life after ICU	28 (75.6)	13 (65)	15(88.2)
Patient's wishes	32 (86.4)	16 (94.1)	16(80)
Family's wishes	29 (78.3)	13 (94.1)	16(80)
Severity scores	31 (83.7)	14(82.3)	17(85)
Prognosis	29 (78.3)	13(76.4)	16(80)
Diagnosis	35 (94.5)	17(100)	18(90)
MV / hospital duration	24(64.8)	11(64.7)	13(65)
Functionality tests or scales	14(37.8)	5(29.4)	9(45)
Others	23(62.1)	12(70.5)	11(55)
	2(5.4)	2(11.7)	0
Population physiotherapists assisted where they performed palliative extubation			
Internal medicine	34 (91.8)	16 (94.1)	18(90)
Oncologic	33 (89.1)	16 (94.1)	17(85)
Surgical	13(35.1)	8(47)	5(25)
Participation in family conferences for palliative extubation decision making			
Yes	26 (70.2)	13 (76.5)	13 (65)
No	11 (29.8)	4 (23.5)	7 (35)

Legend: ICU: Intensive care unit; N: sample size; MV: mechanical ventilation, %: percentage.

Table 3. Physiotherapy practices during palliative extubation.

Survey question	Responses (%) N=37	Without PC training N=17 (%)	With PC training N=20 (%)
Physiotherapy practices prior to a palliative extubation			
Endotracheal suctioning			
Oral suctioning	35 (94.5)	17 (100)	18 (90)
Chest maneuvers	36 (97.2)	17 (100)	19 (95)
Change in MV parameters	13 (35.1)	7 (41.1)	6 (30)
Semi recumbent position (45°)	30 (81)	13 (76.4)	17 (85)
Cuff exsufflation	35 (94.5)	16 (94.1)	19 (95)
Others	37 (100)	17 (100)	20 (100)
	8 (21.6)	4 (23.5)	4 (20)
MV before palliative extubation			
FiO ₂ 21%, PEEP 5 e PS 7cmH ₂ O	19 (51.4)	8 (47.2)	11 (55)
FiO ₂ 50%, PEEP 6-8 e PS 7 - 9 cmH ₂ O	4 (10.8)	2 (11.7)	2 (10)
Others	14 (37.8)	7 (41.1)	7 (35)
Physiotherapy practices after a palliative extubation			
High flow nasal cannula			
Non-invasive mechanical ventilation	1 (1.9)	0	1 (5)
Oxygen therapy (1 - 4L/min)	1 (9.3)	0	1 (5)
Oxygen therapy (4 - 8 L/min)	7 (22.2)	4 (23.5)	3 (15)
Oxygen therapy (8 - 15 L/min)	2 (9.3)	0	2 (10)
Do not include respiratory support	0	0	0
Other	16 (35.2)	7 (41.1)	9 (45)
	10 (22.2)	6 (35.9)	4 (20)
Palliative extubation complications			
Dyspnea	24 (64.8)	11 (64.7)	13 (65)
Laryngeal stridor	22 (59.4)	12 (70.5)	10 (50)
Death rattle	27 (72.9)	11 (64.7)	16 (80)
Agitation	14 (37.8)	7 (41.7)	7 (35)
Other	8 (21.6)	4 (23.5)	4 (20)

Legend: MV: mechanical ventilation; PEEP: positive end expiratory pressure; PS: Pressure Support, FiO₂: Oxygen inspired fraction, %: percentage

Semi-structured interviews results

Fifteen professionals participated in the semi-structured interviews. Data saturation was achieved. The most frequently observed themes in the interviewees' statements, along with their definitions and frequencies, are described in Table 4.

Table 4. Themes, definitions and frequencies of discourse analysis of the semi-structured interviews (n=15).

Themes	Definitions	n(%)
Perceptions about ventilatory support	View of the interviewee about the standardization of VM parameters and physiotherapy actions during palliative extubation	4 (26,7%)
Scientific knowledge to support palliative extubation	Interviewee's reports about the main guidelines and protocols and literature as a tool for decision making in a palliative care extubation	7(46.6%)
Using or not using oxygen after palliative extubation?	Opinions about the need or its absence of oxygen after tube removal	5(33.3%)
Perceptions about family and patients support during palliative extubation	Reports about the family support and professional readiness for a palliative extubation	5(33.3%)
Family instructions after tube removal is important	Report regarding family guidance and instructions about the procedure	6(40%)

Table 4 (Continued)

Differentiation of personalized and standardized physiotherapy actions in a palliative extubation	Interviewee's opinion about possible comparisons of physiotherapy actions used during the steps of a palliative extubation	4(26.7%)
---	--	----------

Legend: n: sample size, %: percentagem, VM: mechanical ventilation.

Theme: Perceptions Related to Ventilatory Support: For some participants (n=4), standardization of mechanical ventilation parameters before palliative extubation is crucial to facilitate symptom management in the future, in addition to techniques such as aspiration and positioning (n=4). However, others (n=2) believe that team alignment and patient awareness level should be standardized.

"I think the issue of whether to wean from ventilation first or extubate with elevated parameters should be standardized." - Interviewee 12

Theme: Scientific Knowledge for Palliative Extubation: The lack of literature and scientific studies on palliative extubation protocols led to various sources of research and education to support decision-making and palliative extubation planning. Some interviewees (n=7) reported they followed the guidance of a national scientific association, scientific articles (n=6), and institutional protocols (n=5) as sources of support, while some (n=2) acknowledged the scarcity of literature to guide their practices.

"For palliative extubation in physiotherapy, there are no specific guidelines if we think about it; specific guidelines don't exist." - Interviewee 8

"In our hospital, we have an (name of the hospital) protocol for palliative extubation, and we rely on it." - Interviewee 3

"I rely on scientific articles (...), the (reference private hospital) protocol, and the institution I work at does not have a palliative extubation protocol." - Interviewee 5

"I find it very similar to the pre-extubation criteria for a patient undergoing curative treatment, based on mechanical ventilation consensus, some guidelines like (national association for intensive care) (...) taking into account scientific articles in palliative care and palliative care manuals." - Interviewee 6

"We have an institutional protocol, which was based on (physiotherapist name) protocol." - Interviewee 10

Theme: Post-Palliative Extubation Oxygen Therapy: When asked about the measures to be taken after tube removal, certain interviewees (n=5) discussed the use of oxygen therapy. In contrast, (n=2) asserted that, at this point, patients should neither be re-intubated nor exposed to oxygen therapy.

"I believe that post-extubation, for example, aspiration and oxygen therapy, it would be interesting to have some form of guidance." - Interviewee 6

"(...) standardize the goals after extubation, do not administer O2 or NIV. I think the major issue is whether oxygen will be available." - Interviewee 7

Theme: Patient and Family Perceptions During Palliative Extubation: Prior to palliative extubation, participants (n=5) emphasized the importance of communicating with the patient's family and their presence during the extubation procedure as crucial for the success and safety of the multidisciplinary team. Additionally, some interviewees (n=2) mentioned music therapy as a means of providing comfort during palliative extubation.

"During extubation, especially, we need to be confident in what we, as physiotherapists, are going to do and be prepared for the presence of family members, in particular." - Interviewee 2

"I had patients who requested and made it clear that they wanted a particular song (...), support for the family, each family will have a different perception of what is happening." - Interviewee 8

Theme: Family guidance after tube removal is important: Some of the interviewees (n=6) believe that providing guidance to the family after palliative extubation is crucial for understanding the necessity of the procedure, improving quality of life, and reducing the suffering and anguish of those involved. However, others (n=2) emphasize symptom control as crucial at this moment.

"After extubation, family guidance should be personalized, along with the patient, so they understand that the endotracheal tube would not resolve or reverse the disease and that it would only bring more discomfort. So, it involves attending to the family as well, as they are part of our treatment unit." - Interviewee 1.

"After extubation, it should be clear that any intervention will be solely for comfort, minimizing dyspnea, therapeutic futility, therapeutic obstinacy, and that the patient, even if initially uncomfortable, will not return to mechanical ventilation and the tube." - Interviewee 9

"Based on our experiences with the family throughout the treatment, I think this conversation should be personalized with the family, but certain points that need to be discussed should be standardized." - Interviewee 4

Theme: Differentiation between standardized and personalized physiotherapist actions in a palliative extubation:

Before palliative extubation, interviewees believed that certain techniques and actions should be standardized, such as suctioning (n=4), patient positioning (n=4), and oxygen therapy (n=2). In contrast, one interviewee believed that patient positioning should be personalized. During palliative extubation, some interviewees (n=3) thought that mechanical ventilation parameters, weaning, and cuff deflation should be standardized, while others (n=2) agreed that physiotherapy care should be personalized. In the post-extubation period, some interviewees (n=5) believed that the decision to use oxygen or not should be standardized.

"The key is to be able to standardize and align ventilatory parameters for extubation (...) preparation not only for the technique we are going to perform but also for our emotional, psychological, and spiritual preparedness." - Interviewee 2.

"The post-tube removal care, such as mobilization (...), airway aspiration, can be personalized." - Interviewee 11

"Extubation itself is already a standardized procedure, following the steps of aspiration, oral cavity check, positioning the patient, checking hemodynamic stability (...) sometimes we may not achieve proper positioning, or the patient's level of consciousness may not be suitable." - Interviewee 6

DISCUSSION

In the present study, the perspective and experiences of Brazilian physiotherapists in the context of palliative extubation were explored, based on a national survey with physiotherapists who have experienced doing a palliative extubation, and further explored through a thematic analysis with some of these therapists. Investigating the experiences and perspectives of physiotherapeutic practices before, during, and after palliative extubation may improve planning, safety and guide professional education.

Experiences from previous work in palliative care units and additional training through specialization programs are responsible for generating new knowledge, improving professional skills and competencies, and this reflects in their ability to address the complex care demands of the patient.¹² Half of the respondents (46%) have no specific training in PC, which highlights the possibility of these professionals are learning through autonomous ways or by continuous learning programs in hospitals or scientific events. Since their practices do not change considerably compared to those with PC training, this may present as competency-acquiring process possibility. This possibility is corroborated by the fact that both professionals with or without PC training reports positive feelings and confidence when performing a palliative extubation.

When patients experience a palliative extubation, they, their families and health professionals expect it would abbreviate the period experiencing the suffering associated with mechanical ventilation^{12,20}. However, the way this procedure is conducted might lead patients to experience more or less intense suffering, such as respiratory symptoms and anxiety, which would influence patients' and families' quality of life.

Another moment that could impact patients and family is the decision-making process to promote a palliative extubation, since this step involves managing emotions and expectations, health professionals might not be trained to deal appropriately with this moment. Some studies demonstrate certain difficulty of the healthcare team with the topic, even in countries where palliative care is more developed, and some argues there is a scarcity of evidence about palliative extubation.^{2,11} In our study, a high percentage of the respondents participated in the decision-making process, which indicates physiotherapists are increasingly improving their participation in such moments, when they present professional competencies to contribute.

Physiotherapist presence during multidisciplinary meetings is essential to ensure that the procedure is carried out confidently and safely by the entire team, contributing to the integration of specific knowledge.¹⁵ In the present study, it was observed that a total of 70.2% (n=26) of the respondents participated in multidisciplinary and family meetings, while 29.8% (n=11) did not. There is a high frequency of professionals included in meetings in Brazil with the advancement of technical and scientific knowledge in palliative care. These findings contradict the literature of Louro et al., who observed in their study that physiotherapists are rarely involved in multidisciplinary team and family meetings, and even when some participate, they reported the low importance of their participation and role.¹⁶ Grandhige et al., in their survey study collecting experiences of physiotherapists in palliative extubation, reported that 47.5% of the respondents are present and involved in discussions of planning and procedures in palliative care with the multidisciplinary team and family members, compared to 6 to 10% of physiotherapists who are not frequently involved.¹⁰ The presence of this professional improves the patient's

quality of life, avoids respiratory discomfort symptoms, respiratory secretion accumulation, and provides relief measures at the end of life.^{11,17}

The data show that both professionals with (90%/18) and without (94, 1%/16) specialization in Palliative Care perform palliative extubation safely. However, the literature suggests that specific specialization contributes to greater confidence in performing the procedure, highlighting the importance of targeted education for physiotherapists working in this area. Mastery of clinical practice may influence the accuracy of care provided, and the lack of proper preparation and support has been associated with increased stress and anxiety related to death among healthcare professionals. These findings indicate that, although safety in performing palliative extubation is not limited to specialization, specific training may enhance emotional and professional security in managing these patients¹².

There are multiple factors associated with the initiation of the discussion regarding palliative extubation. In the present study, the main factors reported by physiotherapists about when start considering palliative extubation were prognosis at 94.5% (n=35), quality of life before and after ICU admission at 86.4% (n=32), and the desires of family members at 83.7% (n=31). Prognosis is an important factor in decision-making for interventions, care planning, facilitating patient-centered care, and sharing decisions with the family.¹³ A systematic review found that the proportion of patients who die when clinicians predict they will die ranged from 13.9% to 78.6%.¹⁴

Patient evaluation is essential in palliative care, before, during, and after treatment.¹¹ In the present study, respondents reported a high frequency of the use of endotracheal aspiration technique at 94.5% (n=35) and oral aspiration at 97.2% (n=36) in the pre-palliative extubation period, corroborating with the study by Zalaf et al., who observed a significant number of assessed physiotherapists using aspiration regularly, which may result from an automated routine.¹⁸ Aspiration is considered a procedure that can cause discomfort, trauma, hypoxemia, and hemodynamic instability and should not be systematically performed, but only when necessary [19]. In addition, techniques such as positioning the patient at a 45° angle on the bed at 94.5% (n=35), cuff deflation at 100% (n=37), and reduction of MV parameters at 81% (n=30) were reported. According to Yeow et al., positioning in bed allows postural drainage and can be useful, as well as gentle oral suction in pre-extubation patients.⁸

Terminal weaning is done through progressive reduction of ventilatory parameters until complete extubation, always with the concern of preventing any signs of discomfort before or after extubation.^{20,21} In the present study, the majority of respondents, (51.3%, n=19), stated they use FiO2 21%, PEEP 5, and PS 7cmH2O as minimum mechanical ventilation parameters in the proximal period of tube removal. Long et al. observed that FiO2, PEEP, and static pressure in the time-period closest to ventilator withdrawal were predictive of shorter time to death and discomfort for patients. From a physiological perspective, patients requiring prolonged ventilatory support have a high probability of rapid deterioration in oxygenation and ventilation.²¹ The creation of protocols that address respiratory dysfunctions through the incorporation of variables such as FiO2, PEEP, and static pressures can serve as a valuable tool to help communication between the multidisciplinary team and family members when discussing ventilator withdrawal for comfort and extended communication time with the family.^{22,23}

Supplemental oxygen is often prescribed for palliative care patients to control their dyspnea at the end of life, even if they are not hypoxemic.^{24,25} In a survey sent to 648 palliative care specialists, 70% of them responded that they had prescribed palliative oxygen if the patient was dyspneic.²⁵ However, in the present study, 35.2% (n=16) of the total respondents do not use oxygen therapy after extubation. This change in practice is due to the increasing publications mentioning that oxygen supplementation is unnecessary and lacks benefits, especially in controlling dyspnea at the end of life.²⁶⁻³⁰ Uronis et al. conducted a systematic review to determine the effect of supplemental oxygen on relieving dyspnea in individuals with cancer, who were mildly hypoxemic or non-hypoxemic. The pooled data from this review indicated that oxygen was not effective in reducing the sensation of dyspnea in this patient population.²⁸ The use of oxygen in patients receiving palliative care is widely prescribed. However, the evidence supporting this practice is essentially nonexistent regarding dyspnea relief unless there is some degree of hypoxemic reversibility.³¹

Some complications may be observed after the removal of the endotracheal tube. Our results showed the main complications physiotherapists experienced after an palliative extubation was dyspnea (64.8%, n=24), laryngeal stridor (59.4%, n=22), and death rattle (72.9%, n=27), corroborating with Yeow et al., who observed that after the removal of the endotracheal tube, saliva and secretions can accumulate in the back of the oropharynx and the tracheobronchial tree, leading to strident sounds during inspiration and expiration. This phenomenon, sometimes called death rattle, tends to occur in the terminal phase in patients after MV withdrawal, who are too weak for effective expectoration. Death rattle is observed in 23% to 90% of end-of-life patients. Although death rattle is thought to not be extremely distressing to the patient, caregivers may feel distress that their loved one is choking.⁸

The present study highlights the importance of patient and family involvement in decision-making along with the multidisciplinary team. The importance of involved family is in line with previous literature findings.^{32,33} In contrast to the mixed results observed in family satisfaction and psychological distress, several studies have found that primary palliative

care interventions focused on the family are consistently associated with a decrease in the use of intensive care at the end of life.^{34,35} In Brazil, it is quite uncommon for families to talk about death. This cultural aspect brings some challenges when discussing palliative extubation with family members. Sometimes, the meeting with family members can even be described as a painful moment. However, it takes longer for relatives to understand their loved one's prognosis and that artificial life support can lead to suffering.³⁶

The study presented some limitations. The questionnaire was not validated, and closed-ended questions could have some influence on the volunteer's response. In addition, not all respondents answered the entire questionnaire.

CONCLUSION

Brazilian physiotherapists are commonly present during a palliative extubation and the ones who perform it are usually confident regarding conducting the procedures, especially those with palliative care specialized training. There was a lack of protocols regarding the actions conducted by physiotherapists during the steps of palliative extubation (pre, during and post procedure), which reflected patients' comfort as a priority. Low ventilatory parameters, not adopting oxygen therapy and high-quality communication with family and patient were listed as actions of these professionals.

REFERENCES

1. Brochard LJ. Clinical challenges in mechanical ventilation. *Lancet*. 2016;387(10030):1856-1866. DOI: 10.1016/S0140-6736(16)30176-3
2. Willms D, Brewer JA. Survey of respiratory therapists' attitudes and concerns regarding terminal extubation. *Respir Care*. 2005;50(8):1046-1049. PMID: 16225709.
3. Huynh TN, Walling AM, Le TX, et al. Factors associated with palliative withdrawal of mechanical ventilation and time to death after withdrawal. *J Palliat Med*. 2013;16(11):1368-1374. DOI: 10.1089/jpm.2013.0142
4. Lage JSS, Pincelli ASM, Furlan JAS, et al. Extubação paliativa em unidade de emergência: relato de caso. *Rev Bioét*. 2019;27(2):313-317. DOI: 10.1590/1983-80422019272315
5. Marengo MO, Flávio DA, Silva RHA. Terminalidade de vida: bioética e humanização. *Med (Ribeirão Preto)*. 2009;42(3):350-357. DOI: 10.11606/issn.2176-7262.v42i3p350-357
6. Von Gunten C, Weissman DE. Ventilator withdrawal protocol. *J Palliat Med*. 2003;6(5):773-774. DOI: 10.1089/109662103322515293
7. Truog RD, Cist AFM, Brackett SE, et al. Recommendations for end-of-life care in the intensive care unit: The Ethics Committee of the Society of Critical Care Medicine. *Crit Care Med*. 2001;29(12):2332-2348. DOI: 10.1097/CCM.0B013E3181659096
8. Yeow ME, Chen E. Ventilator withdrawal in anticipation of death: The simulation lab as an educational tool in palliative medicine. *J Pain Symptom Manage*. 2020;59(1):165-171. DOI: 10.1016/j.jpainsymman.2019.09.025
9. Prendergast TJ. Withholding or withdrawal of life-sustaining therapy. *Hosp Pract* (1995). 2000;35(6):91-100. DOI: 10.1080/23771003.2000.12451630
10. Grandhige AP, Timmer M, O'Neill MJ, et al. Respiratory therapists' experiences and attitudes regarding terminal extubations and end-of-life care. *Respir Care*. 2016;61(7):891-896. DOI: 10.4187/respcare.04168.
11. Almeida SS, Rigo FL, Leite EIA. Perception of the multiprofessional team about palliative extubation in a pediatric care unit. *Enferm Foco*. 2022;13:e-202213. DOI: 10.21675/2357-707X.2022.v13.e-202213
12. Mercadante S, Gregoretti C, Cortegiani A. Palliative care in intensive care units: Where, what, who, when, how. *BMC Anesthesiology*. 2018;18:106. DOI: 10.1186/s12871-018-0574-9
13. Ribeiro JR, Poles K. Palliative Care: Practice of Family Health Strategy Physicians. *Revista Brasileira de Educação Médica*. 2019;43(3):62-72. DOI: 10.1590/1981-52712015v43n3RB20180172
14. Chu C, White N, Stone P. Prognostication in palliative care. *Clinical Medicine*. 2019;19(4):306-310. DOI: 10.7861/clinmedicine.19-4-306
15. White N, Kupeli N, Vickerstaff V, Stone P. How accurate is the 'surprise question' at identifying patients at the end of life? A systematic review and meta-analysis. *BMC Medicine*. 2017;15:139. DOI: 10.1186/s12916-017-0907-4
16. Louro B, Paiva BKR, Estevão A. Extubação Paliativa em pacientes terminais: revisão integrativa. *Revista Brasileira de Cancerologia*. 2020;66(4):e-111212. DOI: 10.32635/2176-9745.RBC.2020v66n4.1098
17. Wang JS. Effect of joint mobilization and stretching on respiratory function and spinal movement in very severe COPD with thoracic kyphosis. *Journal of Physical Therapy Science*. 2015;27(10):3329-3331. DOI: 10.1589/jpts.27.3329
18. Zalaf A LR, Bianchim MS, Alveno DA. Assessment of knowledge in palliative care of physical therapists students at a university hospital in Brazil. *Brazilian Journal of Physical Therapy*. 2017;21(2):114-119. DOI: 10.1016/j.bjpt.2017.03.006
19. Marcucci FCI. O papel da fisioterapia nos cuidados paliativos a pacientes com câncer. *Revista Brasileira de Cancerologia*. 2005;51(1):67-77. DOI: 10.32635/2176-9745.RBC.2005v51n1.1999

20. Lacerda FH, Checoli PG, Silva CMD, Brandão CE, Forte DN. Mechanical ventilation withdrawal as a palliative procedure in a Brazilian intensive care unit. *Revista Brasileira de Terapia Intensiva*. 2020;32(4):528-534. DOI: 10.5935/0103-507X.20200090
21. Long AC, Muni S, Treece PD, Engelberg RA, Nielsen EL, Fitzpatrick AL, Curtis JR. Time to Death after Terminal Withdrawal of Mechanical Ventilation: Specific Respiratory and Physiologic Parameters May Inform Physician Predictions. *Journal of Palliative Medicine*. 2015;18(12):1040-1047. DOI: 10.1089/jpm.2015.0115
22. Truog RD, Campbell ML, Curtis JR, Haas CE, Luce JM, Rubenfeld GD, Rushton CH, Kaufman DC; American Academy of Critical Care Medicine. Recommendations for end-of-life care in the intensive care unit: a consensus statement by the American College of Critical Care Medicine. *Critical Care Medicine*. 2008;36(3):953-963. DOI: 10.1097/CCM.0B013E3181659096
23. Curtis JR, White DB. Practical guidance for evidence-based ICU family conferences. *Chest*. 2008;134(4):835-843. DOI: 10.1378/chest.08-0235
24. Booth S, Wade R, Johnson M, Kite S, Swannick M, Anderson H; Expert Working Group of the Scientific Committee of the Association of Palliative Medicine. The use of oxygen in the palliation of breathlessness: a report of the expert working group of the scientific committee of the association of palliative medicine. *Respiratory Medicine*. 2004;98(1):66-77. DOI: 10.1016/j.rmed.2003.08.008
25. Luce JM, Luce JA. Perspectives on care at the close of life: management of dyspnea in patients with far-advanced lung disease: "once I lose it, it's kind of hard to catch it...". *JAMA*. 2001;285(10):1331-1337. DOI: 10.1001/jama.285.10.1331
26. Abernethy AP, Currow DC, Frith P, Fazekas BS, McHugh A, Bui C. Prescribing palliative oxygen: a clinician survey of expected benefit and patterns of use. *Palliative Medicine*. 2005;19(2):168-170. DOI: 10.1177/026921630501900219
27. Uronis HE, Currow DC, McCrory DC, Samsa GP, Abernethy AP. Oxygen for the relief of dyspnea in mildly or non-hypoxaemic patients with cancer: a systematic review and meta-analysis. *British Journal of Cancer*. 2008;98(2):294-299. DOI: 10.1038/sj.bjc.6604161
28. Abernethy AP, McDonald CF, Frith PA, Clark K, Herndon JE 2nd, Marcello J, Young IH, Bull J, Wilcock A, Booth S, Wheeler JL, Tulskey JA, Crockett A, Currow DC. Effect of palliative oxygen versus room air in relief of breathlessness in patients with refractory dyspnea: a double-blind, randomized controlled trial. *The Lancet*. 2010;376(9743):784-793. DOI: 10.1016/S0140-6736(10)61115-4
29. Quinn-Lee L, Gianlupi A, Weggel J, Moch SD, Mabin J, Davey S, Davis L, Williams K. Use of oxygen at the end of life: on what basis are decisions made? *International Journal of Palliative Nursing*. 2012;18(8):369-372. DOI: 10.12968/ijpn.2012.18.8.369
30. Campbell ML, Yarandi H, Dove-Medows E. Oxygen is nonbeneficial for most patients who are near death. *Journal of Pain and Symptom Management*. 2013;45(3):517-523. DOI: 10.1016/j.jpainsymman.2012.02.012
31. LeBlanc TW, Abernethy AP. Building the palliative care evidence base: lessons from a randomized controlled trial of oxygen vs room air for refractory dyspnea. *J Natl Compr Canc Netw*. 2014;12(7):989-992. DOI: 10.6004/jnccn.2014.0095
32. Davies JD. Noninvasive Respiratory Support at the End of Life. *Respir Care*. 2019;64(6):701-711. DOI: 10.4187/respcare.06618
33. Schulz V, Novick RJ. The distinct role of palliative care in the surgical intensive care unit. *Semin Cardiothorac Vasc Anesth*. 2013;17(4):240-248. DOI: 10.1177/1089253213505237
34. Alshehri HH, Olausson S, Öhlén J, Wolf A. Factors influencing the integration of a palliative approach in intensive care units: a systematic mixed-methods review. *BMC Palliat Care*. 2020;19(1):113. DOI: 10.1186/s12904-020-00616-y
35. Ito K, George N, Wilson J, Bowman J, Aaronson E, et al. Primary palliative care recommendations for critical care clinicians. *J Intensive Care*. 2022;10(1):20. DOI: 10.1186/s40560-022-00612-9
36. Rady MY, Verheijde JL. The standardization approach in end-of-life withdrawal of life-sustaining treatment: sacrificing patient-centered care? *Philos Ethics Humanit Med*. 2017;12(1):5. DOI: 10.1177/088506661557840

