

# Emotional impact of compassionate extubation on respiratory therapists and nurses: A pilot study

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**Background:** Compassionate extubation (CE) refers to withdrawing mechanical ventilation and allowing a patient to die peacefully at the end of life. The primary objective of this pilot study was to quantify the emotional impact of CE on Respiratory Therapists (RT) and Registered Nurses (RNs).

**Methods:** This pilot survey was conducted between March and April 2021 at an academic medical center among RTs and RNs. It included questions on participants' demographics, work characteristics, and Impact of Events (IES) scale to assess the subjective stress caused by CE. Data were analyzed using descriptive and  $\chi^2$  statistics.

**Results:** Among 20 participants, 18 (90%) were females, 12 (60%) were in the 20–40-year age group, 12 (60%) were RTs, and 8 (40%) RNs. Around 15 (75%) participants worked day shifts with a weekly average of 3–4 shifts, and 14 (70%) performed/observed CE within 1 month before taking this survey. CE performed/observed in a month was  $\leq 2$  among 15 (75%) and 3–5 among 4 (20%) participants. Mean total IES score was 16.7 (12.3) among all participants representing 7 (35%) having low, 6 (30%) moderate, and 7 (35%) high emotional impact when performing CE. Risk of developing post-traumatic stress disorder (PTSD) was present in 6 (30%) participants. A significantly higher number of participants in the low impact group were satisfied with the institutional CE process ( $p = 0.043$ ) than those in the medium/high impact group.

**Conclusion:** This pilot study findings reveal that RTs and RNs experience moderate to high levels of subjective stress when performing CE. One-third of the survey participants were at risk of developing PTSD.

**Key Words:** palliative ventilator withdrawal; compassionate extubation; terminal extubation; end of life ventilator withdrawal; post-traumatic stress disorder

## INTRODUCTION

Mechanical ventilation is a life-supporting intervention commonly used to provide oxygenation and ventilatory support to those suffering from respiratory illnesses. However, in patients with terminal illnesses, this practice often prolongs unnecessary suffering in the dying process [1]. Mechanical ventilation is frequently withheld or withdrawn in anticipation of death when delivering comfort-based, patient-oriented, end of life care [2–4]. Around 20% of mechanically ventilated patients progress to ventilator withdrawal at the end of life [2]. Compassionate extubation (CE) is the process of terminating mechanical ventilation and subsequent removal of the endotracheal tube at the end of life [5, 6]. The goal of CE is to alleviate suffering and minimize respiratory distress at the end of life, as on average, death occurs within an hour after ventilator withdrawal. Despite the intent of easing suffering, a recent study showed that around 19%–30% of patients undergoing palliative ventilator withdrawal experience severe tachypnea (respiratory rate  $> 30$  breaths/min) after CE [7, 8]. This experience may create additional emotional stress for family members and healthcare providers.

Burnout and secondary traumatic stress among critical care clinicians who care for critically ill patients is common due to their frequent exposure to high levels of occupational stress [9–12]. Caring for a dying patient is shown to be independently associated with burnout

syndrome among critical care nurses [13]. With increased integration of palliation within intensive care, more patients are opting for palliative ventilator withdrawal processes, which can take an emotional toll on the healthcare providers involved in patient care. Data suggest that female clinicians and those who spend significant time caring for dying patients are highly vulnerable to experiencing emotional discomfort after a patient death, especially if they are witnessing respiratory distress after extubation [14, 15]. Previous studies have depicted the presence of agonal breathing (gaspings respiration) after CE and its significant association to subjective emotional distress among healthcare workers [16]. Despite the perceived emotional burden associated with CE, there is limited data quantifying the psychological impact on healthcare workers such as Respiratory Therapists (RTs) and Registered Nurses (RNs). Therefore, the primary objective of this pilot survey study was to quantify the emotional impact of performing or observing CE on RTs and RNs working in intensive care units, as most often, RTs and RNs, along with the family members, are present at the bedside during this process.

## METHODS

This was a pilot, cross-sectional survey study conducted between March 2021 and April 2021 at a 664 bed, academic medical center located in

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Chicago, Illinois. It includes 112 adult intensive care unit (ICU) beds to provide medical, cardiac, surgical, and neurological care. The rate of CE at this institution is around 20% which is similar to the rate reported in previous studies [2]. The study protocol was approved by our institutional review board (21020404-IRB01). RTs who worked primarily in adult ICUs and RNs who worked in the medical ICU at the study institution and met the study criteria were enrolled. Study inclusion criteria included any RT and RN that performed CE on an adult within the last 6 months. Any healthcare workers other than RTs or RNs present during the CE were excluded from the study. A link to the survey was distributed via REDCap and responses were recorded anonymously.

### Data collection and survey instrument

The survey collected participant demographic data including age, gender, and personal variables such as professional role (RT/RN), years of experience, primary working shift (day/night), and the number of shifts worked in a week. Additionally, the survey included questions related to CE practices, such as whether CE was performed/observed in the last month and approximate number of CE performed each month. Furthermore, study participants were asked to rate on a scale of 0 (least satisfied) to 10 (most satisfied), their satisfaction with the current institutional CE processes.

The Impact of Events Scale (IES) was utilized to measure the level of emotional impact. The original IES is a 15-item survey tool commonly used to measure avoidance (7 items) and intrusive (8 items) thoughts caused by a stressful event [17]. Intrusive thoughts refers to repeated occurrence of the feelings related to the inciting event and avoidance refers to intentional attempt to control the occurrence of intrusive thoughts related to the event. Participants were asked to rate, on a 4-point Likert scale (0 = not at all, 1 = rarely, 3 = sometimes, and 5 = often), how frequently they attempted to avoid or had intrusive thoughts experienced during or past 7 days of performing CE. The IES yields a total score between 0 and 75, with higher scores indicating increased presence of intrusive thoughts and avoidance attempts. The total points are divided between 2 subscales, with the intrusion subscale ranging from 0 to 40, and the avoidance scale ranging from 0 to 35. Based on the total IES score, the symptom/concern/impact level is considered low for scores <8.5, medium for scores between 8.6 and 19, and high for scores >19 [18]. For post-traumatic stress disorder (PTSD) screening, a cutoff score of  $\geq 27$  has been reported as optimal with a 91% sensitivity and a 72% specificity [19].

### STUDY OUTCOME

The primary study outcome was to assess the emotional impact on RTs and RNs of performing CE, measured by IES.

### STATISTICAL ANALYSIS

Categorical variables are expressed as frequency (percentage). Continuous variables are presented as means  $\pm$  standard deviation (SD) or as medians and interquartile ranges (IQR). All statistical analyses were performed by using SPSS software (version 26.0 for Windows; SPSS Inc, Chicago).

### RESULTS

A total of 21 participants filled out the survey. One participant was excluded from the study due to incomplete data. In this survey, 12 (60%) participants belonged to the 20–40-year age group, 18 (90%) were female, and 12 (60%) were RTs (Table 1). There was a wide range of professional experience, with 6 (30%) with 0–3 years of experience, 8 (40%) with 4–10 years of experience, and 6 (30%) with >10 years of experience. Most (75%,  $n = 15$ ) participants primarily worked the day shift. The approximate number of shifts worked per week was between 3 and 4 among all study participants, 14 (70%) had either performed or observed the CE in the last month, and 10 (50%) either performed or observed the CE during the survey month, with 15 (75%) of them experiencing <2 in the last month. When asked to rate the satisfaction level of CE processes in the ICU on a 0 (least satisfied) to 10 (most satisfied) scale, participants reported a median of 8 (IQR 7–9). Additionally, the

mean intrusion score reported was 6.65 (SD 5.28), and the mean avoidance score was 10 (SD 7.95), with a total mean IES score of 16.7 (SD 12.3) reflecting moderate emotional impact, as reported by all study participants. Using the IES ratings, the impact level was found to be low among 7 (35%), moderate among 6 (30%), and high among 7 (35%) of the survey participants. Also, the risk of PTSD (a score  $\geq 27$ ) was noted among 6 (30%) of the survey participants.

Among those with medium to high emotional impact ( $n = 13$ ), there was a higher number of participants within the 20–40 year age group (61.5%) and most of the participants were females (92.3%). Moreover, the incidence of medium to high levels of emotional impact was higher among RTs (69.2%) than the RNs (30.8%). When comparing the low impact group ( $n = 7$ ) with the moderate/high impact group ( $n = 13$ ), we did not see any significant difference in age, gender, professional role, or professional experience. Additionally, the two groups did not significantly differ in terms of primary shifts worked, whether CE was observed/performed in the last month, or approximate number of CEs performed/observed in the last month. The participants in the low emotional impact group were significantly more satisfied with the institutional CE process as compared to those in the medium/high emotional impact group (median satisfaction score 9 (8–10) versus 8 (7–8.75);  $p = 0.043$ ).

Among participants at risk of developing PTSD ( $n = 6$ ), all (100%) were females, 4 (67%) were within the age of 20–40 years, 4 (67%) were RTs, and 5 (83.3%) worked the day shift (Table 2). Half of those at risk for PTSD had professional experience (between 4 and 10 years) and 67% had observed/performed CE within the last month. The median satisfaction level with institutional CE process was lower among those at risk of PTSD as compared to those with no risk of PTSD (7.5 (IQR 6.75–8.25) vs. 8.5 (IQR 8–9.75)).

Furthermore, RTs and RNs reported similar mean intrusion scores (6.75  $\pm$  5.34 vs. 6.5  $\pm$  5.48), but the mean avoidance score was higher among RTs (12.58  $\pm$  8.43) as compared to the RNs (6.25  $\pm$  5.7) (Figure 1). Similarly, the mean total IES was higher among RTs (19.33  $\pm$  13.3) than the RNs (12.75  $\pm$  10.14). When assessing the emotional impact based on age, participants that were older than 40 years had slightly lower mean intrusion score (6.42  $\pm$  5.12 vs. 7  $\pm$  5.85), higher mean avoidance (10.67  $\pm$  7.14 vs. 9.13  $\pm$  9.48), and higher total IES score (17.08  $\pm$  11.87 vs. 16.13  $\pm$  13.74) as compared to those that were younger than 40 years old (Figure 2). Lastly, participants who performed CE within the last month had lower mean intrusion scores (6.14  $\pm$  5.43 vs. 7.83  $\pm$  5.19), higher avoidance scores (10.21  $\pm$  8.42 vs. 9.67  $\pm$  7.45), and lower total IES (16.36  $\pm$  13.57 vs. 17.5  $\pm$  9.73) when compared to those who did not perform/observe CE within the last month (Figure 3).

### DISCUSSION

Ventilator withdrawal at the end of life is an ethically and emotionally complex process. When death is imminent, it has become an acceptable action to withhold or withdraw artificial ventilatory support to alleviate patient suffering at the end of life [20–22]. Despite this established reasoning [23], reports have shown that patients can still experience intense respiratory events that may lead to unnecessary suffering following ventilator withdrawal, which can trigger traumatic responses or discomfort in those that may witness it [3, 8, 24]. However, there is currently a paucity of information regarding the emotional impact of witnessing patients struggle after palliative ventilator withdrawal among healthcare providers. In this study, we demonstrated a significant degree of emotional burden associated with performing CE on the healthcare providers that were present during the CE.

To our knowledge, this is the first survey study to quantify the emotional impact and risk of developing PTSD among healthcare workers commonly tasked with performing CE at the end of life, such as RTs and RNs. The most significant finding of this study is that around 65% of clinicians involved with the CE process experienced moderate to high levels of emotional distress. Furthermore, the results showed that clinicians with lower levels of satisfaction with the institutional CE process suffered significantly higher levels of emotional distress. Additionally,

**TABLE 1**  
Participant characteristics and emotional impact

Variables	Total (n = 20)	Low impact (n = 7)	Medium/ high impact (n = 13)	P
<b>Age, n (%)</b>				1.0
20–40 years	12 (60)	4 (57.1)	8 (61.5)	
Above 40 years	8 (40)	3 (42.9)	5 (38.5)	
<b>Gender</b>				1.0
Male	2 (10)	1 (14.3)	1 (7.7)	
Female	18 (90)	6 (85.7)	12 (92.3)	
<b>Professional role, n (%)</b>				0.36
Respiratory Therapist	12 (60)	3 (42.9)	9 (69.2)	
Registered Nurse	8 (40)	4 (57.1)	4 (30.8)	
<b>Professional experience, n (%)</b>				0.62
0–3 years	6 (30)	2 (28.6)	4 (30.8)	
4–10 years	8 (40)	2 (28.6)	6 (46.2)	
>10 years	6 (30)	3 (42.9)	3 (23.1)	
<b>Primary shift, n (%)</b>				1.0
Days	15 (75)	5 (71.4)	10 (76.9)	
Nights	5 (25)	2 (28.6)	3 (23.1)	
<b>Number of shifts in a week (n = 19), n (%)</b>				
3–4	19 (100)	6 (100)	13 (100)	
<b>Performed/observed a compassionate extubation in the last month, n (%)</b>				0.66
Yes	14 (70)	5 (71)	9 (69)	
No	6 (30)	2 (29)	4 (31)	
<b>Approximate number of compassionate extubation performed/observed in a month, n (%)</b>				1.0
Less than 2	15 (75)	5 (71.4)	10 (76.9)	
More than 2	5 (25)	2 (28.6)	3 (23.1)	
<b>Compassionate extubation process satisfaction level (scale 0–10), median (IQR)</b>				0.043
Intrusion score, mean (SD)	6.65 (5.28)	2 (2)	9.15 (4.78)	
Avoidance score, mean (SD)	10 (7.95)	2.29 (1.98)	14.23 (6.64)	
Total IES score, mean (SD)	16.7 (12.3)	4.29 (2.5)	23.28 (9.9)	
<b>Impact level, n (%)</b>				—
Low	7 (35)	—	—	
Moderate	6 (30)	—	—	
High	7 (35)	—	—	
<b>Risk of PTSD (IES ≥ 27), n (%)</b>	6 (30)	—	—	

Note: IQR = interquartile range, SD = standard deviation, PTSD = post-traumatic stress disorder, IES = impact of event scale.

this study revealed that around 30% of the participants experiencing moderate to high levels of emotional distress were at risk of potentially developing PTSD.

A common psychological response to a traumatic/stressful situation is initial repetitive intrusive thoughts followed by subsequent suppression of the emotions by deliberately avoiding thinking about the event [25]. Therefore, utilization of an effective tool to measure the psychological impact of a traumatic event, is vital to the objectives of this study, hence the justification of using a quantitative measure such as the IES. According to Horowitz et al. [26], “intrusive experience and psychic numbing after a stressful event are two major symptoms that lead to a diagnosis of post-traumatic stress disorder (PTSD).” The original IES measures these two psychological domains to study the effect of a traumatic/stressful event on an individual. The survey tool is validated and widely used in clinical research to measure stress associated with events like combat, natural disaster, and bereavement [17, 25–27]. This instrument was initially designed to measure war-related stress but later gained popularity to evaluate post-traumatic stress among other groups including emergency services personnel, natural disaster, and assault victims [28]. Overall, this self-reported tool is a reliable and valid measure to evaluate the

**TABLE 2**  
Participant characteristics and PTSD risk

Variables	No PTSD risk (n = 14)	PTSD Risk (n = 6)
<b>Age, n (%)</b>		
20–40 years	8 (57)	4 (67)
Above 40 years	6 (43)	2 (33)
<b>Gender</b>		
Male	2 (14.3)	0
Female	12 (85.7)	6 (100)
<b>Professional role, n (%)</b>		
Respiratory Therapist	8 (57)	4 (67)
Registered Nurse	6 (43)	2 (33)
<b>Professional experience, n (%)</b>		
0–3 years	5 (35.7)	1 (16.7)
4–10 years	5 (35.7)	3 (50)
>10 years	4 (28.6)	2 (33.3)
<b>Primary shift, n (%)</b>		
Days	10 (71.4)	5 (83.3)
Nights	4 (28.6)	1 (16.7)
<b>Performed/observed a compassionate extubation in the last month, n (%)</b>		
Yes	10 (71.4)	4 (67)
No	4 (28.6)	2 (33)
<b>Compassionate extubation process satisfaction level (scale 0–10), median (IQR)</b>	8.5 (8–9.75)	7.5 (6.75–8.25)

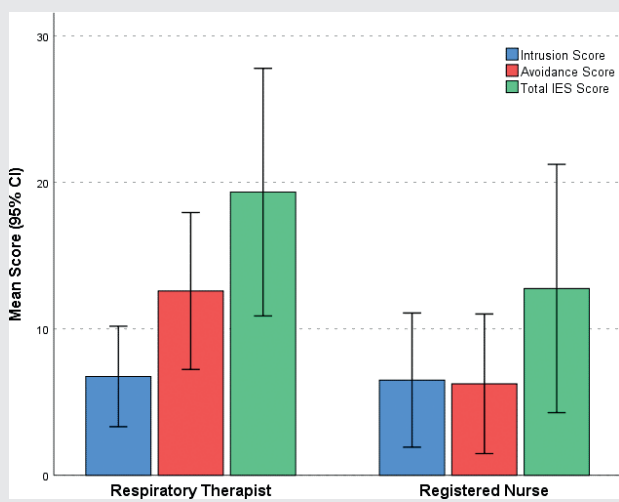
Note: IQR = interquartile range, PTSD = post-traumatic stress disorder.

psychological stress after negative life events but has limited content validity as a sole measure of PTSD due to the lack of hyperarousal symptoms assessment [18]. This scale is commonly used as a screening tool to differentiate between individuals who are at risk of developing PTSD. A recent survey study by Lasalvia et al. [29] used IES-revised version to assess the psychological distress among health-care workers during the coronavirus disease (COVID-19) pandemic and found that 53.8% of the participants showed symptoms of post-traumatic distress. RTs who commonly work with critically ill patients are at risk for developing occupation-induced secondary traumatic stress. Burr et al. [12] recently studied the prevalence of occupation-induced secondary traumatic stress and PTSD among RTs and reported that symptoms of secondary traumatic stress were present among 79% of the participants, and PTSD occurred among 36% of the RTs. Similar to this study, we found around 30% of the participants were at risk of developing PTSD (cutoff score of  $\geq 27$  for total IES) when performing CE.

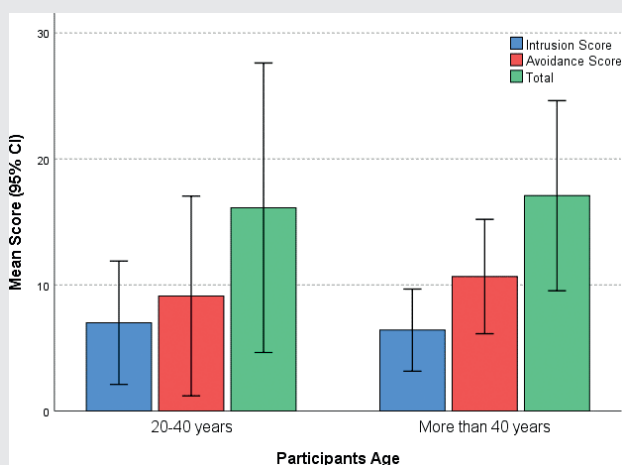
There are several contributing factors towards the negative consequences of performing CE among RTs and RNs. First, when performing CE, the sight of death or impending death may invoke “death anxiety”, which refers to the upsurge of negative emotional reactions when confronted with a situation, raising awareness of one’s own mortality [30]. Attitude towards death is heavily influenced by an individual’s cultural, social, and spiritual belief systems, which further shapes our attitude towards dying patients [31]. Past evidence suggests that RNs with a high level of death anxiety carry negative attitudes towards end-of-life patients [31, 32]. It is plausible that in this study, the personal experiences of RTs and RNs could have influenced the emotional distress experienced when performing CE.

Second, we learned that dissatisfaction with institutional CE procedures and protocols was associated with a higher emotional impact. For patients with non-terminal illnesses undergoing mechanical ventilation, ventilator liberation often involves a systematic, protocol-based approach. Each patient undergoes a screening process and assessment to determine their ability to breathe without the ventilator [33]. However, there is a wide variation in extubation processes for patients undergoing palliative ventilator withdrawal with no standard protocol

**FIGURE 1**  
Impact of event (IES) scale score among Respiratory Therapists and Registered Nurses.



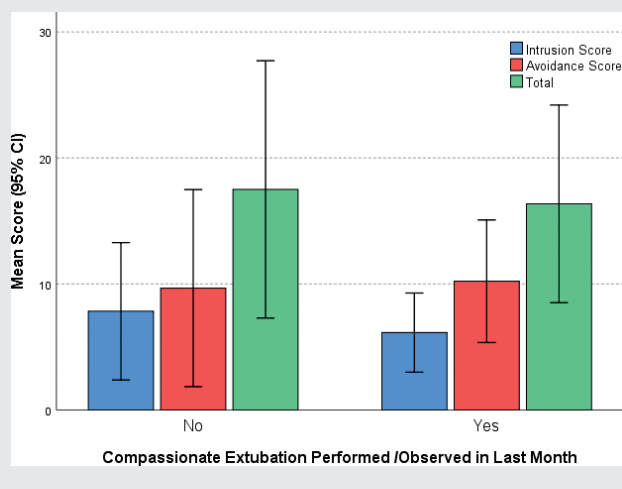
**FIGURE 2**  
Impact of event scale score based on age.



or methods established [16, 34, 35]. During CE, a common clinical practice utilized by RTs is to directly remove the endotracheal tube without any prior weaning/ventilator adjustments [16]. Ventilator weaning, or the gradual lowering of the ventilator support, is thought to prolong the dying process and thus is infrequently utilized [36]. However, immediate extubation has been associated with increased airway obstruction and gasping breaths [37]. Currently, there is no standard protocol, method, or optimal evidence-based strategy that could be used to assure a peaceful and compassionate withdrawal of life support at the end of life. Furthermore, hospital administration could help lessen the emotional impact in healthcare workers by ensuring that appropriate measures are put in place to provide mental support/counselling resources to the healthcare workers that often engage CE processes.

Physicians are not always present at the time of CE [16]. If patients experience significant respiratory distress after CE, RTs and RNs may

**FIGURE 3**  
Impact of event scale based on compassionate extubation performance month.



have moral obligations to intervene to reduce the distress [9, 38–40]. The absence of a physician at the bedside can make it challenging for bedside clinicians such as RNs and RTs to provide timely symptomatic relief aimed at alleviating patient suffering after ventilator withdrawal. It is not clear if physician presence itself improves the CE process and reduces clinician burden, but it is likely that a clear process that RTs and RNs can follow in the absence of a physician to ease patients' suffering is ideal, but this needs further investigation.

Lastly, this study was conducted during a pandemic caused by COVID-19 which may have already contributed an overwhelming sentiment of exhaustion and burnout among healthcare workers globally [41, 42]. To prevent virus transmission, family visitation restrictions were implemented in hospital settings and as a result, some of the CEs were performed without having any family members physically close to the patient to provide support at the end of life [43]. This experience could be psychologically straining for healthcare workers as they witnessed their patients die without the presence of families during the final moments of life [44]. Kaur et al. [45] found the rate of emotional discomfort among RTs increased by 88% (pre COVID-19: 35.5% vs. during COVID-19: 66.7%) when performing CEs. Thus, natural disasters such as a viral pandemic impose an even greater emotional burden, especially on the healthcare workers who perform end of life procedures such as CE [46].

This study has several limitations. First, the major limitation is the pilot nature of the study with a small sample size. This study intended to gather preliminary data to describe the emotional burden that healthcare workers endure when performing a challenging life-altering procedure such as CE. Second, this study was based on a single center and only included medical ICU RNs and adult RTs and most of the survey takers were females. Third, due to the COVID-19 pandemic, there is a probable correlation to the frustration of healthcare workers caused by an increased patient surge. Lastly, in this study we did not collect quantitative data on how many CEs each participant performed. This information could provide insight into whether performing more CEs could lead to improved comfort with the procedure and thus less emotional impact or lead to increased avoidance. Therefore, future studies designed to study the impact of CE should be conducted in a non-pandemic setting; include a larger sample size; include male clinicians, physicians, and other healthcare workers; and quantify the CEs performed or observed by each clinician. Lastly, the impact of providing emotional support to those performing CE could also be assessed.

## CONCLUSION

This survey-based pilot study found that around 65% of RTs and RNs who perform or observe CE among adult patients experience a moderate to a high level of subjective emotional stress. Furthermore, this study revealed that among RTs and RNs that experience a moderate to high level of stress, around 30% were at risk of developing PTSD. Future large-scale studies are needed to explore these research findings and identify measures to lessen the emotional burden associated with CE.

## DISCLOSURES

## Funding support

None.

## Ethical approval

The study protocol was approved by our institutional review board (21020404-IRB01).

## Declaration of interests

RK discloses research funding from American Association of Respiratory Care. DV discloses research funding from Teleflex Medical, Inc. and Rice Foundation, and speaker fees from Theravance Biopharma. JBS discloses research funding from Teleflex and speaker fees from Aerogen and Medline Industries, LC. EC, AF and VJL reports no potential conflict of interest.

## Contributors

RK and AF conceived the idea, RK, VJL and AF implemented the study. RK, VJL and AF supervised the study. RK and AF conducted data analysis. RK, AF, EC, DV and JBS interpreted the data. RK drafted the manuscript, all authors reviewed the manuscript for important intellectual content, and approved the final manuscript.

## REFERENCES

- Prendergast TJ, Luce JM. Increasing incidence of withholding and withdrawal of life support from the critically ill. *Am J Respir Crit Care Med* 1997;155(1):15–20. doi: 10.1164/ajrccm.155.1.9001282.
- Cook D, Rocker G, Marshall J, et al. Withdrawal of mechanical ventilation in anticipation of death in the intensive care unit. *N Engl J Med* 2003;349(12):1123–32. doi: 10.1056/NEJMoa030083.
- Long AC, Muni S, Treece PD, et al. Time to death after terminal withdrawal of mechanical ventilation: specific respiratory and physiologic parameters may inform physician predictions. *J Palliat Med* 2015;18(12):1040–7. doi: 10.1089/jpm.2015.0115.
- Cooke CR, Hotchkin DL, Engelberg RA, Rubinson L, Curtis JR. Predictors of time to death after terminal withdrawal of mechanical ventilation in the ICU. *Chest* 2010;138(2):289–97. doi: 10.1378/chest.10-0289.
- Huynh TN, Walling AM, Le TX, Kleerup EC, Liu H, Wenger NS. Factors associated with palliative withdrawal of mechanical ventilation and time to death after withdrawal. *J Palliat Med* 2013;16(11):1368–74. doi: 10.1089/jpm.2013.0142.
- Prendergast TJ, Claessens MT, Luce JM. A national survey of end-of-life care for critically ill patients. *Am J Respir Crit Care Med* 1998;158(4):1163–7. doi: 10.1164/ajrccm.158.4.9801108.
- Fehnel CR, Armengol de la Hoz M, Celi LA, et al. Incidence and risk model development for severe tachypnea following terminal extubation. *Chest* 2020;158(4):1456–63. doi: 10.1016/j.chest.2020.04.027.
- Morris D, Galicia-Castillo M. Dying with dyspnea in the hospital. *Am J Hosp Palliat Care* 2017;34(2):132–4. doi: 10.1177/1049909115604140.
- Moss M, Good VS, Gozal D, Kleinpell R, Sessler CN. An official critical care societies collaborative statement: burnout syndrome in critical care health care professionals: a call for action. *Am J Crit Care* 2016;25(4):368–76. doi: 10.4037/ajcc2016133.
- Chuang CH, Tseng PC, Lin CY, Lin KH, Chen YY. Burnout in the intensive care unit professionals: a systematic review. *Medicine (Baltimore)* 2016;95(50):e5629. doi: 10.1097/MD.0000000000005629.
- Embriaco N, Azoulay E, Barrau K, et al. High level of burnout in intensivists. *Am J Respir Crit Care Med* 2007;175(7):686–92. doi: 10.1164/rccm.200608-1184OC.
- Burr KL, O'Brien P, Brown JM, Penfil SH, Hertzog JH. Occupational-induced secondary traumatic stress and posttraumatic stress disorder in Respiratory Therapists. *Respir Care* 2020;65(7):1019–23. doi: 10.4187/respcare.06840.
- Poncet MC, Toullic P, Papazian L, et al. Burnout syndrome in critical care nursing staff. *Am J Respir Crit Care Med* 2007;175(7):698–704. doi: 10.1164/rccm.200606-806OC.
- Redinbaugh EM, Sullivan AM, Block SD, et al. Doctors' emotional reactions to recent death of a patient: cross sectional study of hospital doctors. *BMJ* 2003;327(7408):185. doi: 10.1136/bmj.327.7408.185.
- Demoule A, Similowski T. Respiratory suffering in the ICU: time for our next great cause. *Am J Respir Crit Care Med* 2019;199(11):1302–4. doi: 10.1164/rccm.201812-2248ED.
- Kaur R, Syed M, Erondu I, Stringer B, Chen E. Compassionate extubation in adult ICUs: a quality improvement project. *Chest* 2020;158(4):A1299. doi: 10.1016/j.chest.2020.08.1184.
- Schwarzwalz J, Solomon Z, Weisenberg M, Mikulincer M. Validation of the Impact of Event Scale for psychological sequelae of combat. *J Consult Clin Psychol* 1987;55(2):251–6. doi: 10.1037//0022-006x.55.2.251.
- Joseph S. Psychometric evaluation of Horowitz's Impact of Event Scale: a review. *J Trauma Stress* 2000;13(1):101–13. doi: 10.1023/A:1007777032063.
- Coffey SF, Gudmundsdottir B, Beck JG, Palyo SA, Miller L. Screening for PTSD in motor vehicle accident survivors using the PSS-SR and IES. *J Trauma Stress* 2006;19(1):119–28. doi: 10.1002/jts.20106.
- Aslakson RA, Curtis JR, Nelson JE. The changing role of palliative care in the ICU. *Crit Care Med* 2014;42(11):2418–28. doi: 10.1097/CCM.0000000000000573.
- Coelho CBT, Yankaskas JR. New concepts in palliative care in the intensive care unit. *Rev Bras Ter Intensiva* 2017;29(2):222–30. doi: 10.5935/0103-507X.20170031.
- Rubinfeld GD, Curtis JR; End-of-Life Care in the ICU Working Group. End-of-life care in the intensive care unit: a research agenda. *Crit Care Med* 2001;29(10):2001–6. doi: 10.1097/00003246-200110000-00025.
- Schmidt M, Demoule A, Polito A, et al. Dyspnea in mechanically ventilated critically ill patients. *Crit Care Med* 2011;39(9):2059–65. doi: 10.1097/CCM.0b013e31821e8779.
- Desbiens NA, Wu AW. Pain and suffering in seriously ill hospitalized patients. *J Am Geriatr Soc* 2000;48(S1):S183–6. doi: 10.1111/j.1532-5415.2000.tb03130.x.
- Kenardy JA, Webster RA, Lewin TJ, Carr VJ, Hazell PL, Carter GL. Stress debriefing and patterns of recovery following a natural disaster. *J Trauma Stress* 1996;9(1):37–49. doi: 10.1007/BF02116832.
- Horowitz MJ. Stress response syndromes. Northvale, NJ: Jason Aronson Press; 1986.
- Sundin EC, Horowitz MJ. Impact of Event Scale: psychometric properties. *Br J Psychiatry* 2002;180(3):205–9. doi: 10.1192/bjp.180.3.205.
- Sundin EC, Horowitz MJ. Horowitz's Impact of Event Scale evaluation of 20 years of use. *Psychosom Med* 2003;65(5):870–6. doi: 10.1097/01.PSY.0000084835.46074.F0.
- Lasalvia A, Bonetto C, Porru S, et al. Psychological impact of COVID-19 pandemic on healthcare workers in a highly burdened area of north-east Italy. *Epidemiol Psychiatr Sci* 2020;30:e1. doi: 10.1017/S2045796020001158.
- Peters L, Cant R, Payne S, et al. How death anxiety impacts nurses' caring for patients at the end of life: a review of literature. *Open Nurs J* 2013;7:14–21. doi: 10.2174/1874434601307010014.
- Rooda LA, Clements R, Jordan ML. Nurses' attitudes toward death and caring for dying patients. *Oncol Nurs Forum* 1999;26(10):1683–7.
- Braun M, Gordon D, Uziely B. Associations between oncology nurses' attitudes toward death and caring for dying patients. *Oncol Nurs Forum* 2010;37(1):E43–9. doi: 10.1188/10.ONF.E43-E49.
- Thille AW, Richard JC, Brochard L. The decision to extubate in the intensive care unit. *Am J Respir Crit Care Med* 2013;187(12):1294–302. doi: 10.1164/rccm.201208-1523CI.
- Faber-Langendoen K. The clinical management of dying patients receiving mechanical ventilation. A survey of physician practice. *Chest* 1994;106(3):880–8. doi: 10.1378/chest.106.3.880.
- Efstathiou N, Vanderspank-Wright B, Vandyk A, et al. Terminal withdrawal of mechanical ventilation in adult intensive care units: A systematic review and narrative synthesis of perceptions, experiences and practices. *Palliat Med* 2020;34(9):1140–64. doi: 10.1177/0269216320935002.
- Gilligan T, Raffin TA. Withdrawing life support: Extubation and prolonged terminal weans are inappropriate. *Crit Care Med* 1996;24(2):352–3. doi: 10.1097/00003246-199602000-00028.

37. Robert R, Le Gouge A, Kentish-Barnes N, et al. Terminal weaning or immediate extubation for withdrawing mechanical ventilation in critically ill patients (the ARREVE observational study). *Intensive Care Med* 2017;43(12):1793–807. doi: 10.1007/s00134-017-4891-0.
  38. Daly BJ, Thomas D, Dyer MA. Procedures used in withdrawal of mechanical ventilation. *Am J Crit Care* 1996;5(5):331–8. doi: 10.4037/ajcc1996.5.5.331.
  39. Chan JD, Treece PD, Engelberg RA, et al. Narcotic and benzodiazepine use after withdrawal of life support: association with time to death? *Chest* 2004;126(1):286–93. doi: 10.1016/S0012-3692(15)32925-1.
  40. Treece PD, Engelberg RA, Crowley L, et al. Evaluation of a standardized order form for the withdrawal of life support in the intensive care unit. *Crit Care Med* 2004;32(5):1141–8. doi: 10.1097/01.CCM.0000125509.34805.0C.
  41. Benfante A, Di Tella M, Romeo A, Castelli L. Traumatic stress in health-care workers during COVID-19 Pandemic: a review of the immediate impact. *Front Psychol* 2020;11:569935. doi: 10.3389/fpsyg.2020.569935.
  42. Gualano MR, Sinigaglia T, Lo Moro G, et al. The burden of burnout among healthcare professionals of intensive care units and emergency departments during the COVID-19 pandemic: a systematic review. *Int J Environ Res Public Health* 2021;18(15):8172. doi: 10.3390/ijerph18158172.
  43. Hart JL, Turnbull AE, Oppenheim IM, Courtright KR. Family-centered care during the COVID-19 era. *J Pain Symptom Manage* 2020;60(2):e93–7. doi: 10.1016/j.jpainsymman.2020.04.017.
  44. Wendlandt B, Kime M, Carson S. The impact of family visitor restrictions on healthcare workers in the ICU during the COVID-19 pandemic. *Intensive Crit Care Nurs* 2022;68:103123. doi: 10.1016/j.iccn.2021.103123.
  45. Kaur R, Faizi A, Erundu I, Chen E. Piloting a compassionate extubation protocol. *Resp Care* 2021;66 (Suppl 10):3603110.
  46. Duteil F, Mondillon L, Navel V. PTSD as the second tsunami of the SARS-Cov-2 pandemic. *Psychol Med* 2021;51(10):1773–4. doi: 10.1017/S0033291720001336.
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