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Symptom Burden, Communication Difficulties, and Psychological Distress as Predictors of Outcomes in Mechanically Ventilated Patients

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ABSTRACT:

Background: Mechanical ventilation is essential for patients with acute respiratory failure but is frequently associated with pain, anxiety, breathlessness, symptom burden, and communication difficulties. Early recognition of these concerns is important for patient-centered intensive care.

Objective: To assess symptom burden, communication difficulties, and psychological distress as predictors of clinical outcomes among patients receiving invasive mechanical ventilation.

Design/Methods: A quantitative, prospective observational study was conducted among 60 adults receiving invasive mechanical ventilation for at least 24 hours in selected intensive care units. Data were collected using demographic and clinical records, the Puntillo 10-Item ICU Symptom Assessment Checklist, Ease of Communication Scale (ECS), and Faces Anxiety Scale (FAS). Descriptive and inferential statistics were used to examine associations between patient-reported experiences and ventilator-derived clinical parameters.

Results: Among the 60 participants, 61.7% were male and 40.0% were aged 41–60 years. Significant positive correlations were observed between ventilator parameter severity and physical symptom burden ($r = 0.615$, $p < 0.01$), communication difficulties ($r = 0.542$, $p < 0.01$), and anxiety ($r = 0.488$, $p < 0.01$). Greater symptom burden, communication difficulties, and anxiety were therefore associated with greater severity of ventilator-derived parameters.

Conclusion: Mechanically ventilated patients experience substantial physical and psychological distress, accompanied by communication difficulties. Higher symptom burden, impaired communication, and anxiety were significantly associated with greater ventilator parameter severity. Routine assessment of these domains may facilitate early identification of patient needs. Integrating systematic symptom assessment, alternative communication strategies, and psychological support into ICU nursing care may enhance comfort and individualized patient-centered management.

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INTRODUCTION

Mechanical ventilation is an essential supportive therapy in intensive care and is frequently required for patients with acute respiratory failure, severe pneumonia, acute respiratory distress syndrome, sepsis, postoperative respiratory complications, neurological disorders, and other critical illnesses (Brambilla *et al.*, 2025). Although invasive mechanical ventilation helps maintain adequate oxygenation and ventilation while the underlying disease is treated, it can be a physically uncomfortable and psychologically distressing experience for patients. Individuals receiving mechanical ventilation may experience pain, dyspnea, thirst, fatigue, muscle weakness, sleep disruption, limited mobility, discomfort caused by invasive devices, and uncertainty regarding their illness and recovery (Widaryati *et al.,* 2026).

Endotracheal intubation further complicates the experience by restricting patients' ability to communicate verbally. Consequently, patients may struggle to convey their basic needs, physical discomfort, fears, and concerns. This communication limitation can contribute to anxiety, fear, frustration, helplessness, social isolation, anger, and psychological distress (Khalaila *et al.*, 2011). Research has demonstrated that impaired communication during mechanical ventilation is strongly associated with negative emotional experiences and psychological distress, particularly feelings of fear and anger (Happ *et al.,* 2011). Therefore, providing effective alternative communication strategies and individualized psychological support is an important aspect of comprehensive patient-centered ICU nursing care (Brambilla *et al.*, 2025; Zeadnih *et al.*, 2025). Contemporary intensive care practice has shifted away from the routine use of deep sedation and instead promotes a patient-centered approach that prioritizes effective pain management, individualized sedation, prevention and early recognition of delirium, early mobilization, and active involvement of patients and their families (Brambilla *et al.*, 2025).

Therefore, understanding how symptom burden evolves during mechanical ventilation and its relationship to clinical outcomes is an important priority for critical care practice and research. A central contributor to distress among mechanically ventilated patients is the inability to speak and communicate effectively because of endotracheal or tracheostomy tubes Dithole *et al.,* 2017. Difficulty in communication has been consistently reported as one of the most stressful aspects of ICU care, negatively affecting patients' relationships with staff and family, their sense of safety, and their emotional well-being. Patients describe frustration, fear, and a sense of "being lost" when they cannot express basic needs, ask questions, or participate in decisions about their care. These communication barriers may increase anxiety and anger in the acute phase and contribute to intrusive memories, nightmares, and post-traumatic symptoms long after ICU discharge. (Brambilla *et al.,* 2025**)**

Anxiety is a significant concern among critically ill patients, as it can occur alongside physiological instability and may intensify the overall burden of critical illness (Kross *et al.,* 2011; Dithole *et al.,* 2017). Factors such as dyspnea, airway suctioning, unfamiliar ICU surroundings, monitor alarms, inability to communicate verbally, limited physical movement, and fear of death may contribute to persistent psychological distress (Rotondi *et al.,* 2002). Anxiety can also stimulate sympathetic nervous system activity, potentially leading to elevations in heart rate, respiratory rate, and blood pressure. Sedatives and analgesics are commonly administered to relieve anxiety and discomfort in patients undergoing mechanical ventilation (Kross *et al.,* 2011). Although pharmacological therapy is appropriate and necessary for some critically ill patients, excessive or prolonged sedation may increase the risk of adverse clinical outcomes.

In this context, a prospective observational study evaluating the relationships among symptom burden, communication difficulties, psychological distress, and key clinical outcomes in patients in the ICU on mechanical ventilation will provide timely and clinically relevant evidence for the equivalent (Karlsson and Bergbom, 2015). By identifying which aspects of patients' subjective experiences are most strongly associated with adverse outcomes, this study can guide priority areas for nursing assessment, communication support and psychological care in the ICU.

Literature-Based Research Gap

Previous studies have shown that mechanically ventilated patients experience a range of physical and psychological difficulties during their ICU stay. Puntillo *et al.* (2010) reported that critically ill patients experience multiple distressing symptoms, highlighting the importance of systematic symptom assessment in intensive care. Happ *et al.* (2011) identified anxiety and agitation as important experiences among patients receiving prolonged mechanical ventilation, emphasizing the need for appropriate recognition and management of psychological distress.

Communication difficulties are also a major concern among mechanically ventilated patients. Khalaila *et al.* (2011) found that communication difficulties were positively associated with psychological distress, fear, and anger among patients receiving mechanical ventilation. Dithole et al. (2016) further reported in a structured review that mechanical ventilation can interfere with patients' ability to communicate their needs and may contribute to frustration, distress, and anger. Subsequent studies have explored different approaches to improve communication. Holm and Dreyer (2018) reported that communication tools could be helpful for some mechanically ventilated patients but emphasized that systematic communication strategies initiated by nurses were important. Dithole *et al.* (2017) also demonstrated the importance of communication skills in reducing communication-related difficulties among mechanically ventilated patients.

Despite growing evidence on psychological distress and communication challenges during mechanical ventilation, the interrelationships among physical symptom burden, communication difficulties, anxiety, and objectively measured ventilator parameters remain insufficiently characterized, particularly in patients with COPD (Martinho and Rodrigues, 2016). Recent qualitative evidence continues to demonstrate the emotional and care-related consequences of communication difficulties among mechanically ventilated patients and emphasizes the need for further research on individualized communication and psychological support. (Brambilla *et al.,* 2025). Henceforth, a gap remains in understanding how patients' physical symptom burden, communication difficulties, and anxiety are related to ventilator-derived parameters in mechanically ventilated ICU patients (Fonseca *et al.*, 2026). The present prospective observational study was undertaken to address this gap by simultaneously assessing these patient-centered factors and examining their relationships with ventilator-derived parameters.

Objective: To assess symptom burden, communication difficulties, and psychological distress as predictors of clinical outcomes in patients receiving invasive mechanical ventilation**.**

Hypotheses:

H_1: There will be a significant positive relationship between the physical symptom burden and the severity of ventilator-derived parameters among mechanically ventilated patients.

H2: There will be a significant positive relationship between communication difficulties and the severity of ventilator-derived parameters among mechanically ventilated patients.

H3: There will be a significant positive relationship between anxiety levels and the severity of ventilator-derived parameters among mechanically ventilated patients.

Sample Size

Effect Size Calculation

The formula used to calculate Cohen's effect size (f^2) from the coefficient of determination (R^2) is

- $f^2 = R^2 / (1 - R^2)$
- Substituting the provided value of $R^2 = 0.178$
- $f^2 = 0.178 / (1 - 0.178) = 0.178 / 0.822 \approx 0.2165$

Parameters:

- R^2 = 0.178
- Effect size f^2 = 0.2165
- α = **0.05**
- Power = **80%**
- Predictors = **3**

The sample size was estimated using a priori power analysis for a fixed-effects multiple linear regression model (R^2 deviation from zero). Based on the expected coefficient of determination (R^2) of 0.178 from a previous study, the corresponding effect

size (f^2) was calculated as 0.2165. With a significance level of 0.05, statistical power of 80%, and three predictors, the minimum required sample size was estimated to be 55. To provide an adequate margin for potentially incomplete data, a total of 60 participants were considered for the study.

Sampling technique:

Purposive sampling was used in this study..

Inclusion Criteria: Adult ICU patients with

1. All patients were aged between 18 and 60 years.

2. Both male and female Patients.

3. All patients who received invasive mechanical ventilation.

4. All Patients Able to communicate using at least one modality (e.g., mouthing words, nodding/shaking head, writing, communication board), nodding/shaking head, writing, communication board, or gesture-based system.

5. Written informed consent was obtained from the patient or legally authorized representative, as per the ethics requirements.

Exclusion Criteria

1. Patients aged < 18 years.

2. Receiving noninvasive ventilation or respiratory support other than invasive mechanical ventilation.

3. Patients who were unconscious or too sedated to respond to the assessment questions.

4. Severe cognitive or neurological problems that prevented communication or participation in the assessment.

5. Patients who were clinically unstable and unable to participate in the assessment.

6. Patients who had difficulty communicating due to a condition unrelated to mechanical ventilation, making the assessment of the study variables difficult.

7. Patients who were transferred to another hospital or ICU before completion of the required assessments.

8. Patients or their legally authorized representatives who did not consent to participate in the study.

METHODS

Study Design and Population

This prospective observational study was conducted among 60 adult patients receiving invasive mechanical ventilation in an intensive care unit. The study was conducted from April 2026 to July 2026. Patients aged 18 years and above who met the eligibility criteria were recruited using purposive sampling (Barr *et al.*, 2013).

Setting

The study was conducted in the intensive care unit of a tertiary care hospital in Erode, Tamil Nadu, India. The ICU setting was appropriate for this study because mechanically ventilated patients commonly experience physical discomfort, difficulties in communicating their needs, and psychological distress during critical illness (Zaga *et al.*, 2019).

Participants and Sample

The study included 60 adults who received invasive mechanical ventilation. Patients aged ≥ 18 years who fulfilled the predefined eligibility criteria were recruited using purposive sampling during the study period from April 2026 to July 2026. Written informed consent was obtained from the patients or their legally authorized representatives prior to participation.

Data Collection Tools

Baseline demographic and clinical characteristics were collected using a structured data collection form. Patient-reported symptom burden, communication difficulties, and anxiety were assessed using standardized assessment tools, including the Puntillo 10-item ICU Symptom Assessment Checklist, Ease of Communication Scale (ECS), and Faces Anxiety Scale (FAS), respectively (Puntillo *et al*., 2010). Ventilator-derived parameters and relevant clinical information were recorded during the mechanical ventilation period. Clinical outcomes, including duration of mechanical ventilation, ICU length of stay, ventilator-associated complications, and clinical status at ICU discharge, were also documented.

Validity of The Tool:

A panel of experts in Critical Care Nursing, Medical-Surgical Nursing, Nursing Research, and Critical Care Medicine reviewed the developed tools to ensure content validity. These experts evaluated each item for relevance, clarity, comprehensiveness.

Reliability:

To ensure consistency and reliability of the research tools, appropriate assessment procedure were followed. Inter-rater reliability was established for the observational checklist items through independent simultaneous observations by two observers. For multi-item questionnaires, internal consistency reliability was determined using Cronbach's alpha. Additionally, the Faces Anxiety Scale, originally developed by McKinley *et al.,* (2003) was used to assess perceived anxiety. It is a simple visual pictorial chart consisting of five facial expressions to extreme fear—enabling patients to their perceived anxiety easily"

Pilot Study

A pilot study was conducted among six eligible mechanically ventilated patients representing approximately 10% of the planned sample size. The pilot study was undertaken to assess the feasibility of the data collection procedure, clarity, and applicability of the tools, time required for assessment, and practical difficulties encountered in the intensive care setting (Kuruppu *et al*, 2023). The participants in the pilot study were not included in the final study sample.

Ethical Considerations

The study was approved by the Institutional Review Board of SMCH Hospital (EC-Ref Number-003-05-2026-IEC-SMCH, dated 11-5-2026). Informed consent was obtained from the patients or their legally authorized representatives, and the confidentiality and anonymity of all participant data were strictly maintained throughout the study period.

Fieldwork/Procedure

This study was conducted prospectively among 60 adult patients receiving invasive mechanical ventilation in the intensive care unit from April 2026 to July 2026. Eligible participants were recruited using purposive sampling. Administrative Approval: Written permission was obtained from the hospital and ICU administration, and ethical clearance was obtained from the Institutional Ethics Committee before the study was initiated. Screening and Recruitment of Participants: Patients admitted to the ICU were screened based on the predetermined inclusion and exclusion criteria (Ten Hoorn *et al*., 2016). Those who met the eligibility criteria were included in the study after obtaining informed consent. Baseline Assessment: The information included age, sex, educational status, occupation, primary diagnosis, co-morbid conditions, and relevant baseline ventilator parameters (Morandi *et al*., 2017). Physical symptom burden, communication difficulties, and anxiety were assessed using the Puntillo 10-item ICU Symptom Assessment Checklist, Ease of Communication Scale, and Faces Anxiety Scale (McKinley *et al*., 2003), respectively. Relevant ventilator-derived parameters were recorded during mechanical ventilation (Ramnani *et al*., 2026). Clinical outcomes, including duration of mechanical ventilation, ICU length of stay, ventilator-associated complications, and clinical status at ICU discharge, were documented prospectively. Completed data collection forms were reviewed for completeness and consistency before data entry.

Statistical Analysis

Data were analyzed using appropriate statistical methods. Descriptive statistics were used to summarize participant characteristics and study variables. Pearson 'correlation was used to examine the relationships between physical symptom burden, communication difficulties, anxiety, and the severity of ventilator-derived parameters. Multiple linear regression was

used to determine the predictive contribution of physical symptom burden, communication difficulties, and anxiety to the severity of ventilator-derived parameters. Statistical significance was set at $p < 0.05$.

DATA ANALYSIS

Demographic Characteristics of the Participants

Table 1 presents the demographic and clinical characteristics of the participants included in the study (N = 60). Regarding sex, the majority of the participants were male (37, 61.7%), while 23 (38.3%) were females. Regarding age, 16 participants (26.3%) were between 18 and 30 years, 20 (33.3%) were between 31 and 40 years, and 24 (40.0%) were between 41 and 60 years. Thus, the largest proportion of participants belonged to the 41–60-year age group. The participants had a range of medical diagnoses. Chronic kidney failure was reported in nine participants (15.0%), while ARDS and poisoning were each reported in eight participants (13.3%). Sepsis with respiratory failure was also present in eight participants (13.3%). Six participants (10.0%) had a history of snake bite, five (8.3%) had pulmonary edema, four (6.7%) had DKA, and three (5.0%) had pneumonia. Cardiac conditions were reported in five participants (8.3%), while four participants (6.7%) had other medical conditions.

Regarding educational status, 28 participants (46.7%) had primary-level education, 20 (33.0%) had secondary-level education, and 12 (20.0%) were graduate. In terms of marital status, most were married (50, 83.3%), whereas 10 participants (16.7%) were unmarried. Regarding comorbid conditions, diabetes mellitus was reported in 18 participants (30.0%), hypertension in 15 (25.0%), and other comorbid conditions in 27 (45.0%). Overall, the participants represented a diverse range of demographic and clinical characteristics, which provides important context for interpreting the study findings.

2: Descriptive Statistics of Study Variables (N = 60)

Descriptive statistics were used to summarize the distribution of scores for the major study variables among the 60 participants in this study. The Ease of Communication Scale (ECS) scores were distributed across three categories. Eight participants (13.3%) scored 22, 21 participants (35.0%) scored 33, and 31 participants (51.7%) scored 45. The overall mean ECS score was 37.73 (± 7.15).

For the Faces Anxiety Scale (FAS), eight participants (13.3%) reported a score of 2, 17 participants (28.3%) reported a score of 3, 15 participants (25.0%) reported a score of 4, and 20 participants (33.3%) reported a score of 5. The mean FAS score was reported as 33.78 ± 0.72.

Regarding the Puntillo 10-item scale, four participants (6.7%) obtained a score of 1, 17 participants (28.3%) obtained a score of 2, and 39 participants (65.0%) obtained a score of 3. The mean score for the Puntillo 10-item scale was 2.58 ± 0.59.

Overall, the findings indicate considerable variation in communication difficulties and anxiety-related symptoms among mechanically ventilated patients, highlighting the need for systematic assessment and individualized nursing care.

Part III: Clinical Outcomes

Part III assessed the clinical outcomes of the participants using an observational rating scale comprising 12 ventilator-derived and physiological parameters: positive end-expiratory pressure (PEEP), peak airway pressure, plateau pressure, tidal volume, minute ventilation, fraction of inspired oxygen (FiO_2), arterial oxygen partial pressure (PaO_2), inspiratory-to-expiratory (I: E) ratio, Respiratory rate, heart rate, blood pressure, and oxygen saturation (SpO_2).

The total score was categorized into three levels of clinical severity as follows:

Respiratory Parameters	Max score	SCORE RANGE
Respirator rate	2	Total score range 0-4-= low level Total score range 5-9=moderate level
Oxygen saturation	2	
Partial Pressure of Oxygen(PaO2)	1	
Partial Pressure of Carbon-Dioxide(PaCO2)	1	
Heart rate	2	

Peak airway pressure	2	Total score range 10-18 =severe level
Plateau pressure	2	
Positive end expiratory pressure (PEEP)	1	
Tidal Volume	2	
Minute Volume	1	
Fraction of inspired oxygen(FiO2)	1	
I:E(Inspiratory To Expiratory	1	
TOTAL SCALE	18	

Scoring procedure:

Level of ventilator derived parameters	**Frequency(n)**	**Percentage%**
Low level frequency	15	25%
Moderate level frequency	22	37%
Severe level frequency	23	38

The scoring procedure for the ventilator-derived parameters classified the 60 participants into three levels of clinical severity, based on a maximum possible score of 18 points. Among the participants, 15 (25.0%) were classified as having low clinical severity, 22 (37%) had moderate clinical severity, and 23 (38%) had severe clinical disease. The severe clinical category accounted for the largest proportion of participants.

Table.3 presents the correlation between the study variables, symptom burden, communication difficulties, and anxiety, and the severity of ventilator-derived parameters among 60 participants. A statistically significant positive correlation was observed between the Ease of Communication Scale (ECS) scores and ventilator-derived parameters ($r = 0.542$, $p < 0.001$). Similarly, the Faces Anxiety Scale (FAS) scores showed a statistically significant positive correlation with ventilator-derived parameters ($r = 0.488$, $p < 0.001$). The Puntillo 10-item Scale demonstrated a strong positive and statistically significant correlation with ventilator-derived parameters ($r = 0.615$, $p < 0.001$). Overall, the findings indicate that higher levels of symptom burden, communication difficulties, and anxiety were significantly associated with greater severity of ventilator-derived parameters among mechanically ventilated patients.

Description and Interpretation

Table. 3 presents the correlations between symptom burden, communication difficulties, anxiety, and the severity of ventilator-derived parameters among patients who were mechanically ventilated ($N = 60$). A statistically significant positive correlation was observed between the Ease of Communication Scale (ECS) and ventilator-derived parameters ($r = 0.542$, $p < 0.001$). Similarly, the Faces Anxiety Scale (FAS) demonstrated a statistically significant positive correlation with ventilator-derived parameters ($r = 0.488$, $p < 0.001$). The Puntillo 10-item Scale showed the strongest positive correlation with ventilator-derived parameters ($r = 0.615$, $p < 0.001$). All three correlations were found to be statistically significant.

The findings demonstrate significant positive relationships between symptom burden, communication difficulties, anxiety, and the severity of ventilator-derived parameters. Among the three study variables, symptom burden showed the strongest association with ventilator-derived parameters ($r = 0.615$), followed by communication difficulties ($r = 0.542$) and anxiety ($r = 0.488$). This pattern indicates that participants with higher scores on these patient-reported measures tended to have higher severity scores for the ventilator-derived parameters. These findings emphasize the importance of considering symptom burden, communication difficulties, and anxiety when assessing the clinical status of mechanically ventilated patients. Since the analysis was correlational, the observed relationships indicate association rather than a causal effect.

The study was approved by the Institutional Review Board of SMCH Hospital (reference number EC-Ref Number-003-05-2026-IEC-SMCH, dated 11-5-2026). Informed consent was obtained from the patients or their legally authorized representatives, and the confidentiality and anonymity of all participant data were strictly maintained throughout the study period.

RESULTS

The baseline demographic and clinical characteristics of the study participants (n = 60) are summarized in **Table 1.** Of the 60 participants, the majority were male (n = 37, 61.7%), while female participants accounted for 38.3% (n = 23). Regarding age distribution, participants aged 41–60 years formed the largest group (n = 24, 40%), followed by those aged 31–40 years (n = 20, 33.3%) and 18–30 years (n = 16, 27%). In terms of primary medical admission diagnoses, conditions included ARDS (13.3\%), snake bite (10%), poisoning (13.3%), chronic kidney failure (15%), pulmonary edema (8.3%), DKA (6.7%), sepsis with respiratory failure (13.3%), pneumonia (5%), cardiac conditions (8.3%), and others (6.7%). Regarding educational status, nearly half had primary education (n = 28, 47%), followed by secondary education (n = 20, 33%) and graduation (n = 12, 20%). Most participants were married (n = 50, 83.3%). An analysis of comorbid conditions indicated that diabetes mellitus (30%) and hypertension (25%) were the most prevalent co-existing illnesses.

Furthermore, **Table.2** outlines the descriptive statistics and score distributions of the study variables among the 60 participants: the Ease of Communication Scale (ECS) yielded a mean score of 37.73 ± 7.15, with the majority of participants scoring in the higher bracket (n = 31); 33.78 ± 0.72 the Faces Anxiety Scale (FAS) recorded a mean score of 4.45 ± 0.72, with one-third falling under score 5 (n = 20, 33.3%); and the Puntillo 10-item scale showed an overall mean score of 2.57 ± 0.59, where the majority achieved a score of 3 (n = 39, 65%).

Level of Ventilator-Derived Parameters

The observation data revealed the distribution of ventilator-derived parameter severity among the patients: 25% (n = 15) presented with low-level frequency scores, 37% (n = 22) fell into the moderate-level frequency category, and the majority, accounting for 38% (n = 23), experienced severe-level frequency scores in their ventilator-derived parameters.

Correlation Analysis

Table. 3 illustrates the correlation between patient-reported variables (communication difficulties, anxiety, and symptom burden) and the severity of ventilator-derived parameters among patients who were mechanically ventilated (N = 60). A strong, positive, and statistically significant correlation was observed between the Puntillo symptom assessment scores and ventilator parameter severity ($r = 0.615$, $p < 0.001$), indicating that as the physical symptom burden increased, the severity of ventilator-derived metrics also significantly increased. Similarly, the analysis revealed a moderate-to-strong positive correlation between the Ease of Communication Scale (ECS) scores and ventilator-derived parameters ($r = 0.542$, $P < 0.001$). Furthermore, the Faces Anxiety Scale (FAS) scores showed a significant positive correlation with ventilator parameters ($r = 0.488$, $p < 0.001$), highlighting that elevated psychological distress contributes to heightened ventilator parameter severity.

DISCUSSION

The present study demonstrates that mechanically ventilated patients experience substantial symptom burden, communication difficulties, and psychological distress, with each domain showing a significant positive association with the severity of ventilator-derived parameters. The predominance of middle-aged and male participants reflects the heterogeneous clinical population requiring invasive mechanical ventilation, while the high prevalence of diabetes mellitus and hypertension indicates the substantial comorbidity burden commonly encountered in critically ill patients.

Furthermore, 38% of mechanically ventilated patients demonstrated severe-level ventilator-derived parameter scores, while 37% had moderate and 25% had low-level scores. This distribution suggests that a substantial proportion of patients required relatively intensive ventilatory support, reflecting the clinical complexity and respiratory compromise of the study population. Greater ventilator requirements may be associated with increased dyspnea, discomfort, anxiety, and difficulty communicating, potentially contributing to a more distressing ICU experience. Previous evidence indicates that mechanically ventilated patients commonly experience multiple concurrent physical and psychological symptoms, with symptom intensity influenced by illness severity and the intensity of critical care interventions (Puntillo *et al.*, 2010; Tate *et al.*, 2012). Therefore, continuous monitoring

of ventilator parameters alongside systematic assessment of patient-reported symptoms may facilitate early recognition of distress and support individualized nursing management (Karlsen *et al.,* 2023).

The mean Puntillo symptom score indicates a clinically relevant burden of physical symptoms during mechanical ventilation. This finding is consistent with previous evidence showing that critically ill patients commonly experience pain, fatigue, dyspnea, thirst, anxiety, fear, and other distressing symptoms, with symptom intensity influenced by disease severity and intensive care interventions (Bhadade *et al.*, 2023). Puntillo et al. (2010) emphasized the importance of systematic symptom assessment because multiple symptoms may occur concurrently and substantially affect the patient's ICU experience.

Communication difficulties were also prominent in the present cohort. The positive correlation between ECS scores and ventilator-derived parameter severity ($r = 0.542$, $p < 0.001$) suggests that patients requiring more intensive ventilatory support may experience greater difficulty expressing needs and interacting with healthcare professionals. Mechanical ventilation, particularly when accompanied by an artificial airway, can substantially restrict verbal communication and contribute to frustration, fear, helplessness, and unmet needs. Previous studies have similarly identified communication impairment as a major source of distress among mechanically ventilated patients and have highlighted the importance of alternative communication strategies (Doña-López *et al.*, 2026; Han *et al.*, 2010).

Anxiety was significantly associated with ventilator-derived parameter severity ($r = 0.488$, $p < 0.001$). This finding supports evidence that mechanically ventilated patients frequently experience anxiety and agitation related to breathlessness, inability to communicate, environmental stressors, and perceived loss of control (Leung *et al.*, 2018). Psychological distress may also interact bidirectionally with respiratory distress (Puntillo *et al.*, 2010): increasing ventilatory requirements may intensify anxiety, while anxiety-related agitation and increased respiratory demand may complicate patient–ventilator interaction (Doña-López *et al.*, 2026).

The strongest association in this study was observed between physical symptom burden and ventilator parameter severity ($r = 0.615$, $p < 0.001$). This finding suggests that objective indicators of respiratory support may parallel the subjective experience of physical distress. However, the observational design precludes causal inference. Ventilator severity may contribute to symptom burden, while underlying illness and other clinical factors may independently influence both (Holm *et al*, 2020). Therefore, these findings should be interpreted as clinically meaningful associations rather than evidence of direct causality (Tuinman *et al.,* 2016).

Collectively, the findings support an integrated approach to assessment of mechanically ventilated patients. Objective ventilator parameters should be considered alongside systematic assessment of symptoms, communication ability, and psychological distress (Doña-López *et al.*, 2026; Kuruppu *et al.*, 2025). Early identification of these problems may enable individualized nursing interventions, including symptom-directed care, communication aids, reassurance, environmental modification, and psychological support (Tate *et al.*, 2012). Such multimodal assessment may strengthen patient-centered ICU care and potentially improve the overall experience of mechanical ventilation.

Conclusion:

This prospective observational study concludes that mechanically ventilated patients experience a considerable burden of symptoms, communication difficulties, and psychological distress during their ICU stay. Among the 60 participants, communication difficulty, anxiety, and symptoms such as pain, dyspnea, thirst, fatigue, and sleep disturbance were important concerns. The majority of participants demonstrated moderate-to-severe ventilator-derived clinical parameters, and correlation analyses established that higher symptom burdens, communication barriers, and anxiety levels significantly drive up ventilator parameter severity. The findings highlight that symptom burden, impaired communication, and psychological distress should be recognized as critical factors influencing respiratory mechanics and patient-ventilator interaction. Although the observational design does not establish a causal relationship, these factors clearly influence patients' comfort, ventilator management, and clinical recovery. Routine assessment using appropriate tools—such as the Puntillo ICU Symptom Assessment Checklist, Ease of Communication Scale, and Faces Anxiety Scale—can assist nurses in identifying unmet physical and emotional needs. Therefore, ICU nurses should incorporate regular symptom assessment, alternative communication methods, reassurance, emotional support, and appropriate management into routine patient-centered care to support better recovery among mechanically ventilated patients.

Recommendations

- ICU nurses should routinely assess psychological distress, anxiety, symptom burden, and communication difficulties among mechanically ventilated patients.
- Individualized nursing interventions should be considered to address patients' communication and psychological needs during mechanical ventilation.
- ICU healthcare professionals should recognize psychological and symptom-related factors as important components of comprehensive patient-centred ICU care.
- Nursing education and continuing professional development programmes should include training on assessment and management of psychological distress and communication difficulties in mechanically ventilated patients.

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Conflict of Interest

The authors declare that they have no conflicts of interest related to this study.

REFERENCES

[1] Brambilla S, Ausili D, Locatelli G, Di Mauro S, Bellani G, Luciani M., 2025. Communication difficulties in mechanically ventilated voiceless patients in intensive care units: A qualitative study. Nursing in Critical Care. 30(3):e70037. doi:10.1111/nicc.70037.

[2] Widaryati W, Ismail S, Retnaningsih R, Margawati A, Subu MA., 2026. Limitations of Patients' Communication with Mechanically Ventilated Patients: A Scoping Review. Indonesian Contemporary Nursing Journal. 10(2):242–266. doi:10.20956/icon.v10i2.44513.

[3] Khalaila R, Zbidat W, Anwar K, Bayya A, Linton DM, Sviri S., 2011. Communication difficulties and psychoemotional distress in patients receiving mechanical ventilation. *American Journal of Critical Care*. 20(6):470–479. doi:10.4037/ajcc2011989.

[4] Happ MB, Garrett K, Thomas DD, Tate J, George E, Houze M, Radtke J, Sereika S., 2011. Nurse-patient communication interactions in the intensive care unit. *American Journal of Critical Care*. 20(2):e28–e40. doi:10.4037/ajcc2011433.

[5] Zeadnih RF, Al-Qaaneh AM, Hudhud HN, Bani Mohammad I., 2025. Communication with Mechanically Ventilated Patients: Nurses' Perspectives and Practice. Nursing Reports. 15(11):404. doi:10.3390/nursrep15110404.

[6] Rotondi AJ, Chelluri L, Sirio C, Mendelsohn A, Schulz R, Belle S, Im K, Donahoe MP, Pinsky MR., 2002. Patients' recollections of stressful experiences while receiving prolonged mechanical ventilation in an intensive care unit. *Critical Care Medicine*. 2;30(4):746–752. doi:10.1097/00003246-200204000-00004.

[7] Dithole K, Thupayagale-Tshweneagae G, Akpor OA, Moleki MM., 2017. Communication skills intervention: promoting effective communication between nurses and mechanically ventilated patients. *BMC Nursing*. 16:74. doi:10.1186/s12912-017-0268-5.

[8] Karlsson V, Bergbom I., 2015. Patient's thoughts and feelings during and after mechanical ventilation. *Nursing in Critical Care*. 20(2):88–96. doi:10.1111/nicc.12065.

[9] Kross EK, Engelberg RA, Gries CJ, Nielsen EL, Zatzick D, Curtis JR., 2011. ICU care associated with symptoms of depression and posttraumatic stress disorder among family members of patients who die in the ICU. *Chest.* 139(4):795–801. doi:10.1378/chest.10-0652.

[10] Puntillo KA, Arai S, Cohen NH, Gropper MA, Neuhaus J, Paul SM, Miaskowski C., 2010. Symptoms experienced by intensive care unit patients at high risk of dying. Crit Care Med. 38(11):2155–2160. doi:10.1097/CCM.0b013e3181f267ee.

[11] Martinho CIF, Rodrigues ITMR., 2016. Communication of mechanically ventilated patients in intensive care units. *Rev Bras Ter Intensiva.* 28(2):132–140. doi:10.5935/0103-507X.20160027

[12] Fonseca A, Amaral M, Ribeiro M, Encarnação R., 2026. Augmentative and alternative communication in ventilated patients in intensive care units: a scoping review. Australian Critical Care. 39(3):101596.

[13] Barr J, Fraser GL, Puntillo K., 2013. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. *Critical Care Medicine.* 41(1):263–306. doi:10.1097/CCM.0b013e3182783b72.

[14] Zaga CJ, Berney S, Vogel AP., 2019. The feasibility, utility, and safety of communication interventions with mechanically ventilated intensive care unit patients: a systematic review. American Journal of Speech-Language Pathology. 28(3):1335–1355.

[15] Kuruppu RN, Chaboyer W, Abayadeera A, Ranse K., 2023. Augmentative and alternative communication tools for mechanically ventilated patients in intensive care units: a scoping review. Australian Critical Care. 36(6):1095–1109.

[16] Ten Hoorn S, Elbers PWG, Girbes ARJ, Tuinman PR., 2016. Communicating with conscious and mechanically ventilated critically ill patients: a systematic review. Critical Care. 20:333.

[17] McKinley S, Coote K, Stein-Parbury J., 2003. Development and testing of a Faces Scale for the assessment of anxiety in critically ill patients. J Adv Nurs. 41(1):73–79. doi:10.1046/j.1365-2648.2003.02508.x.

[18] Ramnani AP, Armellin L, Rai S., 2026. Accuracy of a visual analogue scale for screening anxiety and depression in patients admitted to an intensive care unit: a comparison with the Hospital Anxiety and Depression Scale. Australian Critical Care. 39(2):101526.

[19] Morandi A, Piva S, Ely EW., 2017. Worldwide survey of the "Assessing Pain, Both Spontaneous Awakening and Breathing Trials, Choice of Drugs, Delirium Monitoring/Management, Early Exercise/Mobility, and Family Empowerment" (ABCDEF) bundle. Critical Care Medicine. 45(11)–e1122.

[20] Karlsen MM, Holm A, Kvande ME, Dreyer P, Tate JA, Günterberg Heyn L, Happ MB., 2023. Communication with mechanically ventilated patients in intensive care units: A concept analysis. *J Adv Nurs.* 79(2):563–580. doi:10.1111/jan.15501.

[21] Leung CCH, Pun J, Lock G, Slade D, Gomersall CD, Wong WT, Joynt GM., 2018. Exploring the scope of communication content of mechanically ventilated patients. *J Crit Care.* 44:136–141. doi:10.1016/j.jcrc.2017.10.044.

[22] Bhadade R, Harde M, Nadkar M., 2023. Clinical practice guidelines for management of pain, agitation, delirium, immobility, and sleep disturbance in the intensive care unit: the ABCDEF bundle. Journal of the Association of Physicians of India. 2023;71(7):11–12.

[23] Han L, Li JP, Sit JWH, Chung L, Jiao ZY, Ma WG., 2010. Effects of music intervention on physiological stress response and anxiety level of mechanically ventilated patients in China: a randomized controlled trial. Journal of Clinical Nursing. 19:978–987.

[24] Doña-López, E., Godoy-González, M., Navarra-Ventura, G., Fernández-Olivares, A., Gomà, G., Estela Esteve, J., De Haro, C., Diaz Santos, E., Salarbous, L., Jodar, M., Blanch, L., López-Aguilar, J., & Fernández-Gonzalo, S., 2026. Trajectories of emotional and physical distress during ICU stay and their association with clinical factors and cognitive status at discharge. Scientific Reports, 16(1), 6281. https://doi.org/10.1038/s41598-026-36684-y

[25] Tuinman PR, Groenhof F, Keesman RL., 2016. The role of communication in mechanically ventilated patients: a systematic review. Critical Care. 20:333.

[26] Holm A, Viftrup A, Karlsson V, Nikolajsen L, Dreyer P., 2020. Nurses' communication with mechanically ventilated patients in the intensive care unit: an umbrella review. J Adv Nurs. 76(11):2906–2918. doi:10.1111/jan.14496.

[27] Kuruppu NR, Chaboyer W, Tobiano G, Abayadeera A, Ranse K., 2025. Feasibility of implementing a communication board to improve communication interactions of mechanically ventilated patients in intensive care units at one Sri Lankan hospital: a pilot randomised controlled trial. Intensive Crit Care Nurs. 87:103891. doi:10.1016/j.iccn.2024.103891.

[28] Tate JA, Devito Dabbs A, Hoffman LA, Milbrandt E, Happ MB., 2012. Anxiety and agitation in mechanically ventilated patients. *Qual Health Res.* 22(2):157–173. doi:10.1177/1049732311421616.

Table 1. Demographic characteristics of participants (N = 60)

Category	Clinical Variable	n	%
Sex	Male	37	61.7%
	Female	23	38.3%
Age (years)	18 to 30	16	26.7%
	31 to 40	20	33.3%
	41 to 60	24	40%
Diagnosis	ARDS	8	13.3%
	Snake bite	6	10%
	Poisoning	8	13.3%
	Chronic kidney failure	9	15%
	Pulmonary Odema	5	8.3%
	DKA	4	6.7%
	Sepsis with Respiratory failure	8	13.3%
	Pnemonia	3	5.0%
	Cardiac condition	5	8.3%
	others	4	6.7%
Educational status	Primary education	28	46.7%
	Secondary education	20	33.3%
	Graduate	12	20%
Marital status	Married	50	83.3%
	Unmarried	10	16.7%
Co morbid condition	**Hypertension**	15	25%
	Diabetes mellitus	18	30%
	Others	27	45%

Table 2. Descriptive statistics of study variables (N = 60)

ECS	22	8	13.3%	37.73 ± 7.15*
FAS	33	21	35.0%	33.78 ± 0.72*
	45	31	51.7%	
	2	8	13.3%	
	3	17	28.3%	
	4	15	25.0%	
	5	20	33.3%	
Puntillo 10-item	1	4	6.67%	2.58± 0.59
	2	17	28.3%	
	3	39	65.0%	

Values are expressed as Mean±SD

*Statistical significance variation is $p < 0.001$

Table 3: Correlation between Study variables (Symptom Burden, Communication, Anxiety) And Ventilator derived Parameters(N=60)

Variables	Ventilator derived Parameters	p-Value
ECS	r =0.542	<0.001
FAS	r =0.488	<0.001
Puntillo 10-item	r =0.615	<0.001

- Analysis revealed a moderate-to-strong positive correlation between the Ease of Communication Scale (ECS) scores and ventilator-derived parameters ($r = 0.542$, $P < 0.001$).
- Faces Anxiety Scale (FAS) scores showed a significant positive correlation with ventilator parameters ($r = 0.488$, $p < 0.001$)
- Puntillo symptom assessment scores and ventilator parameter severity ($r = 0.615$, $p < 0.001$), indicating that as the physical symptom burden increased