



A Descriptive Analysis of Factors Related to Delirium Severity Among Mechanically Ventilated ICU Patients

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Abstract

Delirium is a clinically important complication among mechanically ventilated patients in intensive care and is associated with multiple demographic, neurological, physiological, pharmacological, and social factors. This descriptive observational study involved 100 mechanically ventilated ICU patients at RSU Islam Harapan Anda, Tegal City, and assessed age, Glasgow Coma Scale (GCS), oxygenation status, medication or sedation, and family support using observation, medical records, and the CAM-ICU. Most participants were aged over 75 years (43.0%), followed by 60–74 years (39.0%). Regarding consciousness, 49.0% had mild GCS impairment, 37.0% moderate impairment, and 14.0% severe impairment. Normal oxygenation was observed in 77.0% of patients, while 23.0% experienced hypoxia. Benzodiazepines were the most frequently used medication or sedation (30.0%), followed by opioids (28.0%), combination therapy (24.0%), and other categories. Good family support was reported in 65.0% of patients, whereas 35.0% received inadequate support. These findings indicate that delirium assessment in mechanically ventilated ICU patients should consider interacting clinical and social characteristics to support early detection, monitoring, and preventive nursing care. Routine multidimensional assessment may strengthen patient safety and improve the quality of critical care nursing practice.

Keywords: *Delirium, Intensive care unit, Mechanical ventilation, Risk factors, Critical care nursing.*



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INTRODUCTION

The Intensive Care Unit (ICU) is a specialized hospital unit that manages critically ill patients through close monitoring and various life-support interventions aimed at maintaining vital organ functions. Patients with severe respiratory disorders often require mechanical ventilation as supportive therapy to maintain gas exchange and adequate oxygenation during acute illness (Lewis et al., 2022). The complexity of clinical conditions and the high intensity of interventions during treatment make ICU patients vulnerable to various complications, including acute neurological disturbances such as delirium (Dalli et al., 2023). Delirium is characterized by acute and fluctuating disturbances in attention, consciousness, and cognitive function, making it an important issue in patient safety and the quality of critical care (Bosch Alcaraz & Saz Roy, 2024).

Delirium in ICU patients is multifactorial because its occurrence is associated with interactions between patient-related predisposing factors and precipitating factors arising during intensive care (Ormseth et al., 2023). Mechanical ventilation is an important condition that requires particular attention because patients commonly experience severe illness, communication limitations, immobility, invasive procedures, sleep disturbances, and exposure to sedative medications during treatment (Dalli et al., 2023). Asmare et al. (2025) demonstrated that delirium in critically ill patients is associated with several clinical characteristics and treatment-related factors that should be identified as early as possible to prevent deterioration. The occurrence of delirium is also associated with unfavorable clinical outcomes, including greater complexity of care, increased healthcare resource utilization, and prolonged intensive care treatment (Tiwari et al., 2023).

Age is one of the patient characteristics consistently considered in delirium risk assessment because the aging process is accompanied by reduced physiological and neurological reserves, which increase the vulnerability of the brain to acute stress. A meta-analysis by Ma et al. (2025)

demonstrated that increasing age is among the factors associated with delirium and subsyndromal delirium in patients receiving intensive care. Neurological condition and oxygenation status are also important because decreased levels of consciousness and impaired oxygen delivery may affect cerebral functions required to maintain attention, orientation, and cognitive performance (Erel et al., 2024). These findings indicate that age, level of consciousness assessed using the Glasgow Coma Scale (GCS), and oxygenation status are relevant clinical components when describing factors related to delirium among mechanically ventilated ICU patients (Carvalho et al., 2022).

Pharmacological factors constitute an important component of care for mechanically ventilated patients because sedation and analgesia are frequently required to maintain comfort, reduce pain, and improve patient–ventilator synchrony. Exposure to medications acting on the central nervous system may influence consciousness and cognitive function; therefore, the type and depth of sedation should be considered when assessing delirium in critically ill patients (Lewis et al., 2022). Comparisons among different sedation regimens have demonstrated differences in delirium outcomes associated with dexmedetomidine, propofol, and other sedative agents in mechanically ventilated adults (Heybati et al., 2022). The use of benzodiazepines, opioids, and combinations of several medications should therefore be carefully considered as part of the patient's pharmacological profile in efforts to detect and prevent delirium during ICU treatment (Dalli et al., 2023).

The ICU environment may also affect patients' psychological and cognitive conditions because exposure to noise, inappropriate lighting for circadian rhythms, repeated procedures, communication limitations, and sleep disturbances often occur simultaneously during intensive care. Impaired sleep quality in critically ill patients has been associated with delirium and benzodiazepine use, indicating that environmental factors cannot be separated from comprehensive delirium prevention strategies (van der Hoeven et al., 2024). Family presence and involvement may provide familiar stimulation, emotional support, communication, and reorientation to time and surroundings for patients experiencing limitations during intensive care (Lin et al., 2022). Evidence from systematic reviews and meta-analyses suggests that family-based approaches may contribute to reducing the prevalence of delirium in critically ill patients, making family support an important social factor to consider (Qin et al., 2022).

The fluctuating characteristics of delirium make this condition difficult to recognize consistently, particularly among mechanically ventilated patients who have limited ability to communicate verbally. Assessment using structured instruments such as the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) plays an important role in improving delirium identification among critically ill patients compared with unstandardized clinical assessment (Diao et al., 2024). Nurses occupy a strategic position in this process because they continuously monitor patients and are directly involved in the management of pain, sedation, mobilization, sleep, orientation, and communication during intensive care (Moraes et al., 2022). Systematic identification of factors accompanying delirium can provide a basis for nurses to identify patients requiring more intensive monitoring and support the implementation of more targeted preventive interventions (Nydahl et al., 2023).

RSU Islam Harapan Anda in Tegal City is a healthcare facility that provides intensive care for critically ill patients, including those requiring mechanical ventilation. Nursing service quality data from the ICU that formed the basis of this study indicated an approximately 4% monthly incidence of unplanned extubation, while preliminary observations showed that some episodes of self-extubation had not been optimally documented. Behaviors such as agitation, restlessness, altered consciousness, or attempts to remove medical devices may occur as manifestations of hyperactive delirium, although the diagnosis of delirium still requires assessment using a validated instrument (Bosch Alcaraz & Saz Roy, 2024). These conditions indicate the importance of obtaining a more systematic description of the characteristics and factors accompanying delirium among mechanically ventilated ICU patients in this hospital.

Recent literature has extensively examined the incidence, predictors, risk factors, detection methods, and various preventive interventions for delirium among critically ill populations (Chen et al., 2022; Dalli et al., 2023; Asmare et al., 2025). Data specifically describing age, level of consciousness, oxygenation status, medication or sedation use, and family support simultaneously among mechanically ventilated patients within the local ICU setting are still needed to support nursing practices that reflect actual patient conditions. This need provides an important basis for

conducting descriptive research capable of mapping physiological, neurological, pharmacological, and social factors that should be considered in delirium detection and prevention efforts. Therefore, this study aims to describe the factors influencing delirium levels among mechanically ventilated ICU patients at RSU Islam Harapan Anda, Tegal City.

RESEARCH METHODS

This study employed a descriptive observational design to provide an overview of factors associated with delirium levels among mechanically ventilated patients in the Intensive Care Unit (ICU) of RSU Islam Harapan Anda, Tegal City. The study population consisted of ICU patients receiving mechanical ventilation, with a total sample of 100 respondents included in the analysis. The variables examined comprised age, level of consciousness as assessed using the Glasgow Coma Scale (GCS), oxygenation status, type of medication or sedation, and family support. The descriptive design was selected because the study focused on characterizing the distribution of these factors among mechanically ventilated ICU patients rather than establishing causal relationships between variables.

Data were collected through direct observation and review of patients' medical records using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) and a structured observation sheet. The CAM-ICU was used to support systematic assessment of delirium in critically ill patients, while clinical and demographic information was obtained from observations and available medical records. Data concerning age, GCS, oxygenation status, medication or sedation use, and family support were subsequently organized according to the predetermined study categories. All data were analyzed using univariate analysis and presented as frequency distributions and percentages to describe the characteristics and distribution of each factor among the study participants.

RESULTS AND DISCUSSION

Patient-Related and Neurological Factors: Age and Level of Consciousness

The findings demonstrate that the demographic profile of mechanically ventilated patients in the ICU was dominated by older adults. Of the 100 participants, 43 patients (43.0%) were aged >75 years, 39 patients (39.0%) were aged 60–74 years, 10 patients (10.0%) were aged 45–59 years, and only 8 patients (8.0%) were younger than 45 years. Thus, 82.0% of the study population was aged 60 years or older, indicating that older adults constituted the predominant group receiving mechanical ventilation in the study setting. This distribution is clinically relevant because advanced age has repeatedly been identified as an important predisposing characteristic for delirium among critically ill patients (Ormseth et al., 2023; Ma et al., 2025).

Advanced age may increase vulnerability to delirium through age-related reductions in physiological reserve, cerebral adaptability, and the capacity to tolerate acute systemic stress. Critically ill older adults frequently present with multiple comorbidities, polypharmacy, metabolic alterations, and greater susceptibility to inflammatory and hypoxic insults, which may collectively reduce cognitive resilience during intensive care (Carvalho et al., 2022). Ma et al. (2025), in a systematic review and meta-analysis, identified older age among the factors associated with subsyndromal delirium in ICU populations. The predominance of patients aged ≥ 60 years in the present study therefore highlights an important clinical profile that should receive particular attention during routine delirium surveillance.

The concentration of patients in the >75-year age category is also consistent with evidence showing that delirium is rarely attributable to a single precipitating mechanism. Ormseth et al. (2023) described delirium as the product of interactions between underlying vulnerability and acute precipitating insults, with age representing an important component of baseline susceptibility. In critically ill patients, this vulnerability may become more pronounced when accompanied by severe illness, invasive procedures, infection, sedative exposure, immobility, and mechanical ventilation. The age distribution observed in this study should consequently be interpreted as a description of a population with substantial baseline vulnerability rather than evidence that age alone caused delirium.

Level of consciousness represented another important neurological characteristic of the mechanically ventilated patients included in this study. Based on the GCS categories applied in the original study, 49 patients (49.0%) were classified in the mild category, 37 patients (37.0%) in the moderate category, and 14 patients (14.0%) in the severe category. Although the mild category represented the largest proportion, more than half of the participants collectively belonged to the

moderate or severe categories. Alterations in consciousness are particularly important in critical care because neurological dysfunction, sedative exposure, hypoxemia, and systemic illness can modify a patient's responsiveness and complicate the recognition of fluctuating cognitive disturbances (Bosch Alcaraz & Saz Roy, 2024).

The distribution of GCS categories also emphasizes the methodological challenge of assessing delirium among mechanically ventilated patients. Delirium is primarily characterized by disturbances in attention and awareness that fluctuate over time, whereas GCS is principally designed to quantify level of consciousness through eye, verbal, and motor responses. Mechanical ventilation may further complicate verbal assessment, and sedative medication may reduce responsiveness independently of delirium. For this reason, structured delirium assessment using instruments specifically designed for critically ill patients remains important alongside routine neurological assessment (Diao et al., 2024).

Table 1. Distribution of Age and Level of Consciousness Among Mechanically Ventilated ICU Patients (n = 100)

Factor	Category	Frequency (n)	Percentage (%)
Age	Young adult, <45 years	8	8.0
	Middle-aged adult, 45–59 years	10	10.0
	Older adult, 60–74 years	39	39.0
	Old-old adult, >75 years	43	43.0
	Total	100	100.0
Level of consciousness (GCS)	Mild	49	49.0
	Moderate	37	37.0
	Severe	14	14.0
	Total	100	100.0

The combined distribution presented in Table 1 illustrates that the patient population was characterized simultaneously by advanced age and varying levels of neurological responsiveness. This combination warrants clinical attention because delirium in the ICU emerges from overlapping predisposing and precipitating conditions rather than from an isolated factor. Dalli et al. (2023) reported that delirium occurrence in intensive care was related to a range of patient and treatment characteristics, reinforcing the need for multidimensional assessment. Similarly, Erel et al. (2024) emphasized that evaluation of delirium risk in ICU patients should consider the patient's overall clinical and neurological condition rather than relying on a single indicator.

The finding that 14.0% of patients were categorized as having severe impairment of consciousness is particularly important for bedside assessment. Patients with substantially reduced responsiveness may be difficult to evaluate for delirium because coma, deep sedation, and delirium are clinically distinct states but may occur sequentially during critical illness. Quantitative electroencephalographic research among mechanically ventilated ICU patients has further demonstrated that delirium and coma are associated with measurable changes in brain activity, supporting the importance of careful neurological differentiation (Roberson et al., 2023). Consequently, changes in GCS should be interpreted together with sedation status and a validated delirium assessment rather than being regarded as a direct measure of delirium severity.

The predominance of older patients combined with the observed variation in consciousness also has implications for nursing surveillance. Older mechanically ventilated patients may have limited communication ability, altered sensory perception, and reduced tolerance to environmental disruption, while patients with impaired consciousness may be unable to express early cognitive changes clearly. Tiwari et al. (2023) identified several patient-related and clinical characteristics associated with delirium in an ICU population and emphasized the adverse outcomes accompanying this condition. Regular neurological observation, assessment of fluctuations in mental status, and consistent application of delirium screening are therefore particularly relevant in a population with the characteristics identified in the present study.

These results are also compatible with multicenter evidence indicating that the development of delirium in intensive care should be understood through the patient's baseline vulnerability and evolving clinical condition. Asmare et al. (2025) demonstrated that several clinical predictors were

associated with delirium among ICU patients, whereas Sadaf et al. (2023) similarly reported multiple risk characteristics in critically ill populations. Such findings support the interpretation that age and level of consciousness are clinically meaningful components of delirium assessment, although the descriptive design of the present study does not allow statistical determination of whether either variable independently predicts delirium. The present findings therefore provide a clinical profile that can inform subsequent analytical studies rather than establish a causal relationship.

From a nursing perspective, the high proportion of older adults underscores the need for age-sensitive delirium prevention and monitoring strategies. Orientation, communication adapted to the patient's cognitive and sensory capacities, avoidance of unnecessary deep sedation, regular assessment of neurological status, and preservation of the sleep–wake cycle may be incorporated within comprehensive ICU care. Evidence regarding multicomponent delirium prevention suggests that addressing several modifiable factors simultaneously is preferable to focusing on a single risk characteristic (Chen et al., 2022). Identifying elderly patients and detecting changes in consciousness early can consequently help nurses prioritize patients who require closer observation during mechanical ventilation.

The first set of findings indicates that mechanically ventilated ICU patients at RSU Islam Harapan Anda, Tegal City, were predominantly older adults and displayed heterogeneous levels of consciousness. The largest age category was >75 years (43.0%), while the largest GCS category was mild impairment (49.0%); nevertheless, 51.0% of participants were classified in the moderate or severe GCS categories. These patterns are consistent with contemporary literature emphasizing advanced age and neurological status as clinically relevant components in the multifactorial assessment of delirium among critically ill patients (Jeong & Cho, 2023; Asmare et al., 2025).

Physiological and Pharmacological Factors: Oxygenation Status and Medication/Sedation

Oxygenation status represents an essential physiological component in the care of mechanically ventilated ICU patients because adequate cerebral oxygen delivery is required to maintain normal neurological and cognitive function. The present study showed that 77 patients (77.0%) had normal oxygenation status, whereas 23 patients (23.0%) experienced hypoxia. Although the majority maintained adequate oxygenation, the proportion of patients with hypoxia remains clinically important because impaired oxygen delivery may contribute to acute cerebral dysfunction. Previous evidence has consistently indicated that respiratory failure, hypoxemia, and severe systemic illness may increase vulnerability to delirium in critically ill populations (Bernard-Valnet et al., 2022; Guo et al., 2023).

Hypoxia may influence neurological function through reduced oxygen availability to cerebral tissue, impaired cellular metabolism, and disruption of neurotransmitter activity. These mechanisms can manifest as alterations in attention, orientation, memory, and consciousness, all of which overlap with clinical features observed in delirium. Studies involving critically ill patients with severe respiratory disorders have demonstrated that delirium frequently accompanies acute respiratory failure and complex systemic inflammation (Lee et al., 2023). Therefore, the 23.0% prevalence of hypoxia identified in this study describes a subgroup requiring particularly careful neurological and respiratory monitoring.

Mechanical ventilation is intended to maintain effective gas exchange, yet critically ill patients may continue to experience impaired oxygenation because of underlying pulmonary disease, acute respiratory distress syndrome, pneumonia, or other systemic conditions. Hammad et al. (2020) showed that oxygen saturation may fluctuate in mechanically ventilated patients undergoing endotracheal suctioning, emphasizing the dynamic nature of oxygenation during intensive care. Irawati et al. (2021) similarly demonstrated that clinical procedures and patient positioning may influence oxygen saturation among mechanically ventilated ICU patients. These findings support the importance of interpreting oxygenation as a continuously changing clinical parameter rather than a static measurement.

The relationship between physiological instability and delirium is also influenced by inflammatory and infectious processes commonly encountered in critical illness. Sepsis-associated delirium has been linked to neuroinflammation, endothelial dysfunction, altered cerebral perfusion, and metabolic disturbances that may occur alongside impaired oxygen delivery (Tokuda et al., 2023). Khan et al. (2023) further reported relationships between inflammatory biomarkers and delirium in

critically ill patients with severe systemic disease. The oxygenation profile observed in the present study should therefore be interpreted within a broader physiological context that includes respiratory, inflammatory, and metabolic stress.

Pharmacological exposure constituted another prominent characteristic of the study population. Benzodiazepines were used in 30 patients (30.0%), opioids in 28 patients (28.0%), drug combinations in 24 patients (24.0%), while 9 patients (9.0%) received no medication within the specified categories and another 9 patients (9.0%) received other medications. These findings indicate that most mechanically ventilated patients received sedative, analgesic, or combined pharmacological therapy during ICU treatment. Such therapy is often necessary to improve comfort, reduce anxiety and pain, and facilitate patient–ventilator synchrony, but its neurological effects remain highly relevant in delirium assessment (Lewis et al., 2022).

Table 2. Distribution of Oxygenation Status and Medication/Sedation Among Mechanically Ventilated ICU Patients (n = 100)

Factor	Category	Frequency (n)	Percentage (%)
Oxygenation status	Normal	77	77.0
	Hypoxia	23	23.0
	Total	100	100.0
Medication/Sedation	None	9	9.0
	Benzodiazepine	30	30.0
	Opioid	28	28.0
	Combination	24	24.0
	Other	9	9.0
	Total	100	100.0

The predominance of benzodiazepine exposure deserves particular consideration because this drug class has repeatedly been discussed in relation to delirium among critically ill patients. Benzodiazepines act through gamma-aminobutyric acid pathways and produce sedation, anxiolysis, and amnesia, but deeper or prolonged exposure may interfere with cognitive processing and normal sleep architecture. Contemporary evidence has increasingly supported sedation strategies that minimize unnecessary benzodiazepine exposure and favor lighter sedation whenever clinically appropriate (Lewis et al., 2022). The 30.0% benzodiazepine use identified in this study therefore represents an important pharmacological characteristic that should be considered during delirium surveillance.

Opioid use was identified in 28.0% of participants and should be interpreted within the context of pain management in mechanically ventilated patients. Untreated pain itself can contribute to physiological stress and agitation, while excessive opioid exposure may reduce alertness and affect cognitive function. The clinical challenge is therefore not simply to avoid analgesic therapy, but to balance adequate pain control with the lowest effective exposure to medications that may alter consciousness. Chen et al. (2022) emphasized the importance of structured sedation management among mechanically ventilated patients, including strategies that reduce unnecessary continuous exposure to sedative agents.

Evidence comparing different sedative regimens also demonstrates that medication choice may influence delirium-related outcomes. Heybati et al. (2022) found clinically relevant differences between dexmedetomidine and propofol in critically ill adults requiring mechanical ventilation, while Lewis et al. (2022) reported that dexmedetomidine may offer advantages over several alternative sedative strategies for selected outcomes, including delirium. Qiao et al. (2024) additionally demonstrated that dexmedetomidine-based sedation may influence both physiological responses and delirium incidence among intubated ICU patients. These findings indicate that the type of sedative, depth of sedation, and duration of exposure should be evaluated together rather than considering medication use as a single homogeneous factor.

The 24.0% of patients receiving combination therapy also warrants attention because critically ill patients frequently require multiple drugs simultaneously for sedation, analgesia, hemodynamic support, infection control, and treatment of underlying disease. Polypharmacy can increase the

complexity of neurological assessment because several medications may independently or collectively alter consciousness, attention, sleep, and psychomotor behavior. The pharmacological profile of mechanically ventilated patients may therefore obscure the distinction between medication-related reduced responsiveness and true delirium unless structured assessment is consistently performed. Bosch Alcaraz and Saz Roy (2024) emphasized that accurate delirium assessment in the ICU requires careful consideration of sedation and other treatment-related factors.

The combination of oxygenation findings and medication exposure observed in this study illustrates the interaction between physiological and pharmacological conditions in mechanically ventilated patients. A patient experiencing hypoxia may simultaneously receive sedatives, opioids, or multiple medications, making neurological changes difficult to attribute to one factor alone. This complexity is consistent with evidence showing that delirium in critically ill patients develops through multiple overlapping pathways involving disease severity, respiratory dysfunction, inflammation, sedative exposure, and treatment-related stressors (Guo et al., 2023; Tokuda et al., 2023). The present descriptive findings should therefore be interpreted as a clinical profile of potentially relevant conditions rather than evidence of independent causal effects.

From a nursing perspective, these findings reinforce the importance of continuous monitoring of oxygen saturation, respiratory status, sedation depth, pain, and changes in mental status in patients receiving mechanical ventilation. Maintaining adequate oxygenation while avoiding unnecessary deep sedation may support neurological stability and improve the reliability of delirium assessment. Protocolized approaches such as daily sedation evaluation, medication review, and validated delirium screening can help identify potentially modifiable factors during ICU care (Chen et al., 2022; Moraes et al., 2022).

Environmental and Social Factors: Family Support and the ICU Care Environment

Family support represents an important social component in the care of mechanically ventilated ICU patients because critical illness frequently limits patients' ability to communicate, maintain orientation, and interact normally with their surroundings. The present study showed that 65 patients (65.0%) received good family support, whereas 35 patients (35.0%) received inadequate family support during intensive care. This distribution indicates that most patients had access to meaningful family involvement, although more than one-third remained in a potentially less supportive social condition. Family-centered approaches have increasingly been recognized as relevant components of comprehensive delirium prevention because familiar interaction may help maintain orientation and emotional stability in critically ill patients (Lin et al., 2022; Qin et al., 2022).

Family involvement may provide several forms of support that are particularly valuable for mechanically ventilated patients, including familiar voices, emotional reassurance, reorientation to time and place, and communication regarding personal preferences or routines. These interventions may be especially useful when patients are unable to communicate effectively because of endotracheal intubation, sedation, fatigue, or fluctuating consciousness. Lin et al. (2022) reported that family-centered care interventions may reduce delirium prevalence among critically ill patients, suggesting that family participation can function as more than an emotional intervention alone. Qin et al. (2022) similarly found that family interventions may contribute to delirium prevention in ICU populations when incorporated into structured care.

The 35.0% of patients with inadequate family support remains clinically important because social isolation may intensify psychological stress during intensive care. Mechanically ventilated patients are exposed to unfamiliar surroundings, invasive equipment, limited mobility, restricted verbal communication, and uncertainty regarding their health condition, all of which may increase anxiety and disorientation. Anisah et al. (2025) demonstrated that family support and therapeutic communication are relevant to psychological responses among ICU patients, highlighting the importance of interpersonal support in highly stressful care settings. Limited family involvement should therefore be considered alongside physiological and pharmacological factors when assessing the broader conditions surrounding delirium.

Environmental conditions within the ICU may interact with the degree of family support received by patients. Noise from alarms and equipment, artificial lighting, repeated procedures, disrupted circadian rhythms, and frequent nighttime interruptions may contribute to sleep fragmentation and cognitive disturbances. Van der Hoeven et al. (2024) identified relationships

among sleep, benzodiazepine exposure, delirium, and clinical outcomes in critically ill patients, reinforcing the importance of the ICU environment in neurological stability. Familiar family interaction may partially counterbalance environmental disorientation by providing recognizable sensory and emotional cues.

Sleep disruption is particularly relevant because adequate sleep contributes to cognitive restoration, attention, and maintenance of normal circadian rhythms. Mechanically ventilated patients often experience fragmented sleep due to disease severity, ventilation-related discomfort, nursing procedures, medication exposure, and environmental stimuli. Williams et al. (2023) emphasized that delirium in intensive care emerges from multiple interacting clinical and environmental risk factors rather than from a single exposure. A supportive care environment should therefore address both interpersonal and environmental factors, including sleep promotion, noise reduction, reorientation, and communication.

Table 3. Distribution of Family Support Among Mechanically Ventilated ICU Patients (n = 100)

Factor	Category	Frequency (n)	Percentage (%)
Family support	Good	65	65.0
	Inadequate	35	35.0
	Total	100	100.0

The predominance of good family support shown in Table 3 may represent a favorable characteristic of the care environment in the study setting. Nevertheless, the descriptive nature of this study does not establish that good family support directly prevented delirium or that inadequate support independently increased delirium severity. Evidence from systematic reviews suggests that family involvement is most effective when integrated into multicomponent delirium prevention programs rather than implemented as an isolated measure (Lin et al., 2022; Qin et al., 2022). Interpretation of the present findings should therefore focus on family support as one potentially modifiable component within a broader network of delirium-related factors.

Multicomponent ICU care frameworks further support the inclusion of family participation within delirium prevention strategies. The ABCDE and ABCDEF bundles integrate pain assessment, spontaneous awakening and breathing trials, appropriate sedative selection, delirium monitoring, early mobility, and family engagement to address several modifiable risks simultaneously (Moraes et al., 2022). Early mobilization has also been associated with beneficial effects in delirium prevention and management among critically ill patients, demonstrating the importance of reducing immobility and restoring normal activity as early as clinically feasible (Nydahl et al., 2023). Family participation can complement these strategies by encouraging orientation, reassurance, motivation, and communication during recovery.

Quality-improvement initiatives targeting delirium also demonstrate that prevention is more effective when embedded within routine ICU systems. Owen et al. (2024) reported that structured quality-improvement implementation across adult ICUs could contribute to reductions in delirium through changes in care processes and consistent clinical practice. The implication for the present setting is that family support should not depend solely on individual family availability but may be facilitated through institutional policies, appropriate visiting practices, nurse-family communication, and education. Such approaches may help standardize supportive care while maintaining patient safety and respecting clinical limitations.

The relevance of social and environmental factors may be even greater in older adults and patients with impaired neurological responsiveness. Williams et al. (2024) identified age-related and clinical characteristics associated with ICU delirium in geriatric populations, while Dalli et al. (2026) further demonstrated that delirium and subsyndromal delirium are associated with multiple overlapping risk factors. Patients with reduced cognitive reserve may rely more heavily on external orientation and familiar interpersonal cues when confronted with the unfamiliar ICU environment. Family involvement, when clinically appropriate, may therefore be especially meaningful among patients already vulnerable because of advanced age, altered consciousness, hypoxia, or sedative exposure.

The findings of this study support a nursing approach that integrates family participation with systematic delirium assessment and environmental management. Nurses can facilitate communication between patients and relatives, encourage appropriate reorientation, minimize unnecessary environmental disturbances, promote sleep, and involve families in safe aspects of care when possible. Interventions should remain individualized because patients differ in illness severity, sedation level, communication ability, and tolerance for stimulation. A combined approach is consistent with contemporary evidence emphasizing that delirium prevention requires coordinated management of physiological, pharmacological, environmental, functional, and psychosocial factors (Chen et al., 2022; Owen et al., 2024).

The third set of findings demonstrates that 65.0% of mechanically ventilated ICU patients received good family support, whereas 35.0% experienced inadequate family support. When interpreted together with the previous findings on advanced age, level of consciousness, oxygenation, and medication exposure, the results illustrate the multidimensional clinical environment in which delirium may develop. Contemporary literature supports the view that delirium prevention should combine validated screening with attention to sedation, sleep, mobility, environmental orientation, and family engagement rather than relying on a single preventive measure (Moraes et al., 2022; van der Hoeven et al., 2024). Family support therefore represents a relevant social component within comprehensive critical-care nursing strategies for mechanically ventilated patients at RSU Islam Harapan Anda, Tegal City.

CONCLUSION

The findings indicate that mechanically ventilated ICU patients at RSU Islam Harapan Anda, Tegal City, presented diverse demographic, neurological, physiological, pharmacological, and social characteristics associated with delirium assessment. Most respondents were older adults, particularly those aged >75 years, while the majority had mild GCS impairment and normal oxygenation status. Benzodiazepines were the most frequently used medication or sedation, followed by opioids and combination therapy, whereas most patients received good family support. These findings illustrate that delirium in critically ill patients should be understood through multiple interacting factors rather than through a single clinical characteristic.

Nursing care for mechanically ventilated patients should therefore emphasize systematic delirium screening, continuous neurological and oxygenation monitoring, appropriate evaluation of sedation and analgesic therapy, and involvement of family members whenever clinically feasible. Particular attention should be directed toward older patients, those with impaired consciousness or hypoxia, and patients receiving medications that may influence cognitive function. The descriptive design of this study does not establish causal relationships between the identified factors and delirium severity, so further analytical and multicenter studies are recommended. Future research may also incorporate additional variables such as infection, metabolic disorders, sleep disturbances, duration of mechanical ventilation, and previous cognitive impairment.

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