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Nurse Stress Associated with Delirium Care in Intensive Care Units: A Cross-Sectional Study

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Abstract

Background and Objectives: Delirium is highly prevalent in Intensive Care Units (ICUs). While prior studies have identified hyperactive and hyperalert behaviors as major stressors for nurses caring for delirious patients, limited research exists on ICU nurses' stress specifically related to delirium care. This study aims to investigate the stress experienced by ICU nurses in China when managing patients with delirium. **Methods:** This cross-sectional survey was conducted in China from January to February 2023. A total of 243 ICU nurses participated by completing an online survey that included the Personal Information Questionnaire and the Strain of Caring for Delirium Index (SCDI). Although 260 responses were initially collected, 29 invalid questionnaires were excluded, resulting in a final sample size of 243 valid responses. The SCDI scale demonstrated reliable internal consistency, with Cronbach's α coefficients of 0.744, 0.812, 0.778, and 0.920 across its four subscales. **Results:** The survey results indicated that hypoactive delirium behaviors were perceived as the most significant stressors when caring for delirious patients. Among the behaviors, "noisy/yelling" was identified as the most challenging, whereas "pulling at tubes, dressings" was rated as the least challenging. No significant associations were found between demographic factors and stress levels. **Conclusion:** This study sheds light on the stress levels ICU nurses experience when caring for delirious patients, particularly in relation to hypoactive behaviors. Based on these findings, it is recommended that nurse managers implement stress management strategies and provide targeted delirium-related care training to better support ICU nurses and enhance the quality of delirium care.

Keywords

Delirium, Stress, Intensive Care Units, Nurse

1. Background

Delirium, a neurocognitive disorder, is characterized by rapid and fluctuating changes in consciousness, attention, cognition, and perception of awareness, as described in the "Diagnostic and Statistical Manual of Mental Disorders", Fifth Edition [1]. Delirium has a high incidence in Intensive Care Units (ICUs), ranging from 9.6% to 60.4% [2]-[4], and the incidence of delirium in ICUs was higher than those in non-ICUs [5]. Standardized nursing intervention guidelines for delirium care have been established [6]-[8]. However, nurses have shown deficits in delirium-related knowledge as well as in strategies for managing delirious behaviors while caring for patients with delirium [9] [10], resulting in guidelines that have failed to be implemented in clinical practice, including ICUs. Since ICU nurses have trouble assessing patients' needs, safety issues, and adverse events [11], they have reported moderate strain or burden when caring for patients with delirium [12] [13]. Such a stressful task can increase the nurses' strain and workload, which threatens the quality of delirium care, particularly in terms of longer hospital stays, higher mortality rates, and increased healthcare costs [14]. Accordingly, delirium management by ICU nurses is considered a major challenge in global healthcare [15].

In one retrospective study using the Strain of Care for Delirium Index (SCDI), 800 nurses in Ireland (7.2% worked at ICUs) revealed that "hyperactive and hyperalert behaviors" were the most significant stressors when caring for patients with delirium [12]. The study also indicated that "uncooperative and difficult to manage" behaviors were the most challenging aspects of delirium [12]. Results of a survey conducted by Jose draw a similar conclusion: "hyperactive delirium-related behaviors" were significant burdens, and "uncooperative and difficult to manage" behaviors were the most challenging to handle, based on 86 Indian nurses (39.54% from ICUs) [16]. Recent cross-sectional studies found that nurses who were specialists or who attended a delirium-related training course experienced less stress than their counterparts [17] [18]. However, the samples of those studies targeted nurses working in various departments rather than those specifically in ICUs. Therefore, the results of those findings may not apply to ICU nurses. Additionally, literature and potential factors regarding ICU nurses' stress of delirium and delirium care are scarce. To gain more evidence for a more comprehensive understanding of the situation in China, this study aimed to examine the stress levels and potential factors of ICU nurses when caring for patients with delirium. The expectation of the findings would be to draw the attention of nurse managers to develop appropriate interventions and management strategies in order to reduce nurse stress when caring for patients with delirium in the ICUs.

2. Materials and Methods

A cross-sectional survey of ICU nurses was conducted using a convenience sampling method.

Participants

Participants were recruited via the WeChat App from five provinces in China: Guangdong, Shandong, Jiangsu, Shanghai, and Beijing. Inclusion criteria included nurses with a nursing license who had worked in ICUs for at least one year, had experience caring for patients with delirium, and voluntarily participated in this study. Nurse managers were excluded from the study due to their indirect responsibility for caring for patients with delirium.

Initially, 260 participants completed the web-based survey; however, 29 of them were excluded from the study due to incomplete responses, leaving 243 participants for the analysis.

Sample size

The sample size calculation for this study was based on the Kendall sample size estimation method, wherein the minimum sample size is five times the number of independent variables. In this study, there are 29 independent variables; considering a 15% dropout rate, the minimum sample size expected was 167. To reduce the error rate, the actual study population comprised 243 participants.

Research tools

The web-based survey conducted via the WeChat App for this study consisted of two parts: the Strain of Care for Delirium Index (SCDI) and personal information.

The Strain of Caring for Delirium Index (SCDI) was used to measure the nurses' perceptions of stress levels and difficulties in caring for patients with delirium. The SCDI was originally developed by Milisen *et al.* (2004) and validated by psychometric testing for Chinese nurses [19]. The SCDI is a validated and reliable tool [19] [20]. The 20-item SCDI consists of four dimensions: "hypoactive behavior" (3 items), "low-alert behavior" (4 items), "fluctuating and psychoneurotic behavior" (5 items), and "hyperactive and hyperalert behavior" (8 items). Each item was scored on a 4-point Likert scale, ranging from "1" = "very easy" to "4" = "very difficult." Each dimension score was calculated by summing the item scores and dividing by the number of items in that dimension. An overall mean score of the 20 items was the total score divided by 20. A higher score indicated a greater perception of the level of stress [19]. The Cronbach's α of the overall SCDI scale and its four dimensions were 0.744, 0.812, 0.778 and 0.920.

Personal information included age, gender, marital status, education level, years of employment, job title, whether the participant was a specialist nurse, whether they had attended delirium-related training courses, and hospital ranking.

3. Results

The descriptive analysis examined participants' demographics and employment characteristics (N = 243). Participants were predominantly female (88.50%), aged 30–39 years (51.90%), and married (75.30%). Most held a bachelor's degree or higher (81.10%), with 37.00% having more than 10 years of employment experience. Most participants (70.40%) had attended delirium-related training courses,

and 76.10% worked in Grade III-A hospitals. No statistically significant differences were found in the mean scores across all variables, including age (p = 0.461), gender (p = 0.651), marital status (p = 0.922), education level (p = 0.904), years of employment (p = 0.844), job title (p = 0.686), specialist nurse status (p = 0.397), attendance of delirium-related training (p = 0.790), and hospital ranking (p = 0.883). ANOVA and independent t-tests were conducted where appropriate, but none revealed significant differences (all p > 0.05). The demographic characteristics of the participants are shown in Table 1.

Table 1. Descriptive analysis of participants' demographics and employment characteristics (N = 243).

Variable	n (%)	Mean ± S.D.	F/t	p
Age (year)			0.777[a]	0.461
21 - 29	73 (30.00)	2.42 ± 0.74		
30 - 39	126 (51.90)	2.34 ± 0.70		
40 - 54	44 (18.10)	2.48 ± 0.60		
Gender			0.457[b]	0.651
Male	28 (11.50)	2.46 ± 0.84		
Female	215 (88.50)	2.38 ± 0.67		
Marital status			0.098[b]	0.922
Single	60 (24.70)	2.40 ± 0.74		
Married	183 (75.30)	2.39 ± 0.68		
Education level			0.121[b]	0.904
College	46 (18.90)	2.40 ± 0.73		
Bachelor's degree and above	197 (81.10)	2.39 ± 0.68		
Years of employment			0.275[a]	0.844
1 - <2	15 (6.20)	2.34 ± 0.68		
2 - 5	74 (30.50)	2.45 ± 0.76		
6 - 10	64 (26.30)	2.37 ± 0.66		
>10 - 31	90 (37.00)	2.37 ± 0.67		
Job title			0.754[a]	0.686
Beginner	113 (46.50)	2.39 ± 0.77		
Intermediate	105 (43.20)	2.37 ± 0.64		
Advanced	25 (10.30)	2.54 ± 0.54		
Specialist nurse			−0.848[b]	0.397
Yes	115 (47.30)	2.35 ± 0.64		
No	128 (52.70)	2.43 ± 0.74		
Attend delirium-related training course			−0.267[b]	0.790
Yes	171 (70.40)	2.38 ± 0.70		
No	72 (29.60)	2.41 ± 0.69		
Hospital ranking			0.657[a]	0.883
Grade III Premium	7 (2.90)	2.62 ± 0.83		
Grade III-A	185 (76.10)	2.39 ± 0.72		
Grade 3B	26 (10.70)	2.38 ± 0.55		
Others	25 (10.30)			

a: ANOVA; b: ind. t test.

The study assessed participants' perceptions of the difficulty in managing

delirium-related behaviors in patients, categorized into hypoactive, low-alert, fluctuating and psychoneurotic, and hyperactive behaviors. Hypoactive behaviors, such as being withdrawn, quiet, or apathetic, were rated as moderately difficult to manage (M = 2.59, SD = 0.75), with "withdrawn or unusually quiet" behaviors being the most challenging (M = 2.61, SD = 0.86). Low-alert behaviors, including lack of understanding and slow speech, were perceived as somewhat easier to manage (M = 2.44, SD = 0.72). Fluctuating and psychoneurotic behaviors, such as speaking incoherently or repetitive behaviors, were rated as the easiest to manage (M = 2.21, SD = 0.86). Hyperactive behaviors, such as restlessness and inappropriate attempts to get out of bed, were perceived as more difficult (M = 2.40, SD = 1.15), with behaviors like pulling at tubes being particularly challenging (M = 2.36, SD = 1.15). Overall, the findings suggest that hypoactive and hyperactive behaviors pose greater challenges for caregivers than fluctuating or low-alert behaviors. Perceptions of Difficult and Easy Care Regarding Delirium-Related Behaviors are shown in Table 2.

Table 2. Perceptions of difficult and easy care regarding delirium-related behaviors (N = 243).

Item	Very easy n (%)	Easy n (%)	Difficult n (%)	Very difficult n (%)	M (S.D.)
Hypoactive behavior					2.59 (0.75)
Are withdrawn, unusually quiet	17 (7.0)	103 (42.4)	80 (32.9)	43 (17.7)	2.61 (0.86)
Are apathetic, unmotivated	16 (6.6)	101 (41.6)	94 (38.7)	32 (13.2)	2.58 (0.80)
Have decreased amount of motor activity	16 (6.6)	49 (42.4)	93 (38.3)	31 (12.8)	2.57 (0.79)
Low-alert behavior					2.44 (0.72)
Have a lack of knowledge or understanding of their situation or illness)	36 (14.8)	78 (32.1)	91 (37.4)	38 (15.6)	2.54 (0.93)
Have difficulty concentrating and are easily distracted	44 (18.1)	93 (38.3)	87 (35.8)	19 (7.8)	2.33 (0.86)
Speak slowly or in a hesitant manner	23 (9.5)	102 (42.0)	95 (39.1)	23 (9.5)	2.49 (0.79)
Show little eye contact	23 (9.5)	116 (47.7)	83 (34.2)	21 (8.6)	2.42 (0.78)
Fluctuating and psychoneurotic behavior					
Call someone known to him/her by another name	51 (21.0)	109 (44.9)	64 (26.3)	19 (7.8)	2.21 (0.86)
Are talking to people not actually present	63 (25.9)	99 (40.7)	57 (23.5)	24 (9.9)	2.17 (0.93)
Show repetitive behavior	57 (23.5)	98 (40.3)	64 (26.3)	24 (9.9)	2.23 (0.92)
Speak incoherently	63 (25.9)	99 (40.7)	56 (23.0)	25 (10.3)	2.18 (0.94)
Alternate between lucid moments and confused episodes	50 (20.6)	99 (40.7)	67 (27.6)	27 (11.1)	2.40 (1.15)
Hyperactive and hyper-alert behavior					
Have disturbed sleep-wake cycles	61 (25.1)	83 (34.2)	58 (23.9)	41 (16.9)	2.33 (1.03)
Are restless, agitated	60 (24.7)	88 (36.2)	51 (21.0)	44 (18.1)	2.33 (1.04)
Are noisy/yelling #	69 (28.4)	71 (29.2)	40 (16.5)	63 (25.9)	2.40 (1.15)
Are irritable	67 (27.6)	76 (31.3)	41 (16.9)	59 (24.3)	2.38 (1.13)

Continued

Have increased amount of motor activity	44 (18.1)	82 (33.7)	65 (26.7)	52 (21.4)	2.51 (1.02)
Are uncooperative, difficult to manage #	64 (26.3)	67 (27.6)	52 (21.4)	60 (24.7)	2.44 (1.13)
Try to get out of bed inappropriately #	62 (25.5)	72 (29.6)	48 (19.8)	61 (25.1)	2.44 (1.12)
Pull at tubes, dressings, … #	73 (30.0)	70 (28.8)	40 (16.5)	60 (24.7)	2.36 (1.15)

Correlation between personal information and stress level.

4. Discussion

The study revealed that ICU nurses perceive moderate strain when caring for patients with delirium. Notably, our findings indicate that "hypoactive behavior" is the most significant stressor. This contrasts with previous literature, where "hyperactive behavior" was typically identified as the primary concern. This discrepancy may arise from the unique challenges that ICU nurses face, as they are often more experienced in managing hyperactive behaviors.

Additionally, the moderate strain reported suggests a nuanced understanding of the stressors within the ICU context. The varied experience levels of participants (46.5% beginners and 53.5% advanced) may contribute to this perception, reflecting different levels of care maturity. It is important to consider how these perceptions influence the quality of care provided to patients.

Our findings indicate that "hypoactive behaviors" are perceived as the highest stressor, particularly in aspects related to a lack of knowledge or understanding. This highlights a critical area for further training and education. Unlike prior studies, which emphasized hyperactive behaviors, our results suggest that the subtler signs of delirium require greater attention and understanding from nursing staff.

In previous literature, "hyperactive and hyperalert behaviors" were considered a major strain. The difference in findings could be attributed to the ICU nurses' greater familiarity with managing these behaviors, which may result in lower perceived stress levels in this study. Furthermore, our findings call for a shift in focus towards understanding and addressing the less overt, yet equally challenging hypoactive and low-alert behaviors in delirium management. In addition, "hypoactive" and "low-alert" behaviors are considered unnoticeable symptoms of delirium [18] [21] [22] and are usually underestimated in changes in delirium characteristics [23]-[25]. Furthermore, some studies have identified that deficits in delirium-related knowledge, especially regarding etiology and symptom assessment, represent a major strain on resources when handling delirium behaviors [13] [16]; Wa. Taken together, uncertainty regarding disease changes, unfamiliarity with delirium in "hypoactive" and "low-alert" behaviors, deficits in delirium-related knowledge, and/or high care responsibilities contribute to a greater psychological burden for ICU nurses when caring for patients with "hypoactive behaviors" compared to those caring for patients with other delirium-related behaviors.

Interestingly, our analysis using the SCDI showed that behaviors categorized as "hyperactive and hyperalert," such as "noisy/yelling" and "pulling at tubes," were

perceived both as difficult challenges and, in some cases, as easier to manage. This duality suggests that while these behaviors can be disruptive, nurses may have developed effective coping strategies to manage them, potentially through training or experience. Physical restraint is an easier method used to control patients' aggressive behaviors, such as "uncooperative," "self-extubating", and "irritable" [26]. Thus, caring for those with "hyperactive" or "hyperalert behaviors" is no longer a big challenge. However, the use of physical restraint varies significantly across care units due to ethical considerations. When restraints are avoided, nurses often invest more effort into monitoring and providing specialized care, which can lead to increased workloads. This highlights the dilemma in managing "hyperactive and hyperalert behaviors", which underscores the need for improved strategies and resources to help nurses deliver high-quality delirium care. Unexpectedly, our findings did not fully align with previous studies, which indicated that specialists or those who attended delirium-related training courses experienced less strain. While some participants reported lower strain levels, these differences did not reach statistical significance, suggesting that further investigation into the frequency and content of such training programs is warranted. In the study, participants who were specialists or attended delirium-related care training courses reported less strain than their counterparts while working with patients with delirium. However, these differences did not reach statistical significance. The study did not account for the frequency, course modules, and duration of participation in delirium-related courses, or the knowledge regarding delirium care, which might be related to the perception of strain levels in ICU nurses. Additionally, this study had some limitations. The sample was restricted to ICU nurses in specific regions, which may limit the generalizability of the findings. Future research should consider a more diverse sample and explore additional factors influencing stress levels among nurses. Furthermore, reliance on self-reported measures may introduce bias. Addressing these limitations will enhance the robustness of future studies on this critical issue.

5. Conclusion

This study highlights the significant stressors identified by ICU nurses when caring for patients with delirium. Based on the findings, nurse managers should develop effective stress management strategies and enhance delirium-related care through continued education tailored for ICU nurses. Additionally, future research could explore the long-term effects of targeted training on nurse stress levels and patient outcomes, as well as investigate other potential factors contributing to stress in ICU settings. This would provide a more comprehensive understanding of how to improve the care of patients with delirium.

Ethical Approval

The study was approved by the ethics committee of the author's affiliation (2023-LHKY-003-01). Before filling out the survey, eligible participants were informed

of the purpose, methods, confidentiality, and potential impact of the study.

Conflicts of Interest

The author declare that there are no conflicts of interest or financial support that could influence the results of this study.

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