ORIGINAL ARTICLE

Nurses' Knowledge and Subjective Strain in Delirium Care: Impact of a Web-based Instructional Module on Nurses Competence

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Abstract

Background: Delirium, a prevalent condition among elderly individuals admitted to hospitals, particularly in intensive care settings, necessitates specialized medical intervention. The present study assessed the proficiency of nurses in the management of delirium and their subjective experience of stress while providing care for patients with delirium in emergency rooms and critical care units.

Materials and methods: The study adopted a quantitative descriptive approach, utilizing standardized self-reporting measures that assessed the nurses' expertise and perceived burden of care. A cohort of 86 nurses from a tertiary care hospital in North India participated in the study. Additionally, the impact of the web-based instructional module in enhancing the nurses' knowledge in delirium management was assessed by one group pretest–posttest quasi-experimental study.

Findings: The research revealed that nurses exhibited significant deficiencies in their knowledge, particularly in relation to the symptoms and causes of delirium. The most significant source of subjective stress was attributed to hyperactive delirium-associated behaviors, characterized by uncooperative and aggressive conduct. The utilization of the web-based instructional program significantly enhanced the comprehension of nurses about the management of delirium.

Conclusion: This study revealed a significant knowledge gap among nurses in delirium management and emphasizes the considerable subjective stress, particularly in dealing with hyperactive delirium-associated behaviors. The positive impact of the web-based instructional program underscores its potential as a valuable tool for enhancing nurses' knowledge and addressing these challenges in healthcare settings.

Keywords: Delirium, Emergency wards, Hyperactive delirium, Intensive care units, Nurses, Nurses knowledge about delirium, Subjective strain, Web-based instructional module.

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Highlights

- Nurses caring for delirium patients especially those with hyperactive behaviors experience severe subjective stress in emergency medical departments and intensive care units (ICUs).
- A web-based training package successfully increased nurses' understanding of delirium, demonstrating its potential as a useful teaching resource.
- The most difficult delirium behaviors are those that are hyperactive and hyperalert, underscoring the importance of specialized training and nursing support systems.
- The study emphasizes the value of specialized training and support mechanisms for nurses caring for patients with delirium since these measures will improve patient care and nurse well-being.

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Introduction

Delirium, as described in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), is an abrupt organic disorder characterized by disturbances in consciousness, and attention associated with impairment in recent and immediate memory along with disturbance of perception and awareness.[1–3] The aforementioned disturbances develop rapidly and exhibit daily fluctuations, resulting in varying psychomotor behaviors, namely, hyperactive, hypoactive, or mixed, as categorized by Lipowski.[4] This transient mental syndrome presents sudden alterations in cognitive function, consciousness, attention, and disruptions in the sleep–wake cycle. Common among older inpatients, affecting more than one-third of those aged 70 and above, delirium is especially prevalent in individuals receiving mechanical ventilation in ICUs and those in terminal stages of illness. Delirium is a commonly occurring condition among critical care patients with substantial clinical consequences, having a prevalence rate ranging from 32 to 87%. This condition significantly impacts the lives of those affected, demanding specialized care and careful attention.[2,4,5]

Delirium is often underdiagnosed in clinical settings, leading to the omission of proper diagnosis and insufficient treatment.[2] The potential for worsening physical, mental, and cognitive impairments, as well as the negative impact on overall quality of life, is a serious concern when mental health professionals do not promptly intervene. The presence of delirium in patients was associated with extended durations of hospitalization, elevated mortality rates, and increased burden on both family members and healthcare professionals.[6–8] The syndrome has a significant correlation with adverse consequences such as falls, aspiration pneumonia, and diagnostic challenges, emphasizing the urgent need for effective strategies in evaluating, managing, and preventing these issues.[8,9] Nurses employed in emergency departments assume a crucial position in this particular process.

Research has shown that nurse-led interventions can reduce the likelihood of delirium and improve patient outcomes.[10–12] However, challenges occur due to a shortage of nurses, a heavy workload, and inadequate knowledge of delirium, leading nurses to have unpleasant experiences. Qualitative research has shown that care for patients with delirium causes stress and anxiety among nurses, which is made worse by unexpected behaviors such as restlessness in hyperactive cases or withdrawal in hypoactive individuals.[2,13,14] These actions make it more difficult to determine a patient's requirements, making both patients and caregivers uncomfortable and increasing the subjective workload for nurses.[15]

Numerous studies consistently highlight the low level of nurses' understanding regarding delirium, despite the dangers that arise when delirium develops in ICU patients.[16–18] The mean percentage of nurses who accurately answered the knowledge questions in a study on their understanding of delirium and the risk factors that are connected with it was 64.91%, whereas the average percentage of nurses who correctly answered the risk factor questions was 46.15%.[17] Research that looked specifically at ICU nurses' awareness of delirium revealed that, on a 25-item questionnaire, nurses' mean understanding of the condition was 64.4%, indicating a moderate to poor level of knowledge.[18]

These consistently low percentages have significant implications for patient care and delirium prevention. Improved understanding might help nurses and the medical staff recognize or avoid delirium, which would lessen its detrimental effects. The difficulties nurses face in accurately diagnosing delirium highlight the significance of continuing education on delirium detection and key features, especially when caring for critically ill patients. Without an understanding of the dynamic and varied clinical presentations of delirium, ICU nurses could not always detect its emergence during patient care. Educational initiatives have the potential to enhance the understanding of the nurses, potentially leading to improved delirium identification and reducing the associated negative consequences.

Delirium requires prompt detection and treatment since it is easily preventable and treatable. Nurses on the frontlines are essential in detecting changes in cognitive state and initiating preventative actions, necessitating an in-depth understanding of the underlying causes of delirium and clinical judgment.[14] Despite significant research on delirium evaluation, risk factors, management, and prevention, there is a limited exploration of the psychological effects on ICU nurses.[15] Although delirium has been shown to have an adverse emotional impact on patients and families in certain research, less is known about the psychological strain it has on nurses working in medical emergencies and ICUs.[1,2]

Failure to recognize delirium in ICU patients may stem from knowledge deficits among healthcare providers caring for this patient population, particularly gaps in understanding patient presentation and associated risk factors. This study's primary goal was to assess the nurses' knowledge of delirium management and subjective strain while caring for delirium patients in the medical emergency department and ICU settings of a tertiary care center. Additionally, the research aimed to investigate the impact of an online learning educational intervention on nurses' competence in delirium management employing a preintervention/postintervention design. The study's findings may guide targeted educational interventions to address knowledge gaps and alleviate subjective strain among nurses caring for delirium patients in the specified healthcare setting.

Materials and Methods

Study Design

The current study employed a mixed-methods approach to comprehensively investigate nurses' knowledge and subjective strain in delirium care, with a particular focus on assessing the impact of a web-based educational program. The quantitative aspect utilized a descriptive study design, employing self-reporting questionnaires, including the strain of care for delirium patients and a domain-specific knowledge questionnaire, to assess nurses' knowledge levels and subjective strain while caring for delirium patients. The quasi-experimental design involved a one-group pretest–posttest assessment to evaluate the efficacy of the web-based educational module, delivered through a social media application. The module covered various aspects of delirium management. This comprehensive research design allowed for a rigorous examination of nurses' knowledge and experiences, offering a holistic understanding of delirium care and the educational intervention's impact.

Settings and Samples

The present study involved a random sample of 86 nurses who were selected from the registered nurses working in the emergency wards and ICUs of a tertiary care teaching hospital located in North India.

Tools and Techniques

The researchers collectively conducted a comprehensive review of relevant literature to identify suitable standardized instruments for their study. The strain of care for delirium index (SCDI), created by Milisen et al.,[19] was employed in the study to evaluate the level of strain experienced by nurses who are responsible for caring for delirious patients in the emergency medical department. The index consists of four subscales that assess several dimensions of patients' behavioral characteristics: hypoactive behavior (three items), hypoalert behavior (four items), fluctuating course and psychoneurotic behavior (five things), and hyperactive/hyperalert behavior (eight items). The 20 objects were evaluated using a rating scale ranging from 1 (representing a level of ease) to 4 (representing a level of difficulty). The potential overall score of the index ranges from 20 to 80, with higher scores indicating a higher level of caregiving strain. The original English version of the questionnaire was utilized for the administration of the survey, which required an estimated completion time of 20 minutes. The creators of the index indicated that its Cronbach's α coefficient was 0.88.[18] The Cronbach's alpha coefficient for the SCDI in the study was computed to be

0.793, which suggests a reasonable degree of internal consistency within the collected data.

The "nurses' knowledge of delirium," containing 35 true/false questions referring to 3 relevant domains (A) the presentation, manifestation, and outcomes of delirium (10 items), (B) the cause and risk factors of delirium (11 items), and (C) prevention and management strategies of delirium (14 items) was used.[17,18] The total score was adjusted from 0 to 35 and classified into poor knowledge (0–11), moderate knowledge (11–21), and good knowledge (22–35). The Cronbach's α coefficient of 0.72 suggests that the questionnaire exhibits a satisfactory level of reliability.

Web-based Educational Program

The intervention in this study involved a web-based educational program comprehensively designed based on relevant clinical guidelines and literature. The program aimed to enhance nurses' knowledge about delirium through a comprehensive approach. Divided into four main parts, each with a specific focus, the program provided a detailed understanding of delirium. First, the educational program described the definition, characteristics, and types, followed by the methods of prevention and risk factors associated with delirium. Another session described the delirium treatment strategies, and a concluding part explored diagnostic and screening procedures for delirium. The learning program employed a multimedia approach, incorporating texts, pictures, sound clips, and evaluative components to engage participants actively. The content validity of the learning program was ensured through a rigorous evaluation by a panel of experts, including nursing faculty members and critical care specialists. The program was delivered to participants through WhatsApp, ensuring accessibility and convenience. Posttest assessments, conducted 2 weeks after the intervention, gauged the effectiveness of the e-learning module in improving nurses' knowledge about delirium. This comprehensive and interactive educational intervention served as a valuable tool to address knowledge gaps and enhance nurses' competence in delirium management.

Method of Data Collection

The research approach followed ethical principles as specified in the Declaration of Helsinki, thereby assuring the well-being of the participants. Informed consent was sought from all participants before questionnaire administration. The act of participating was declared voluntary, and the preservation of data confidentiality was upheld. The process of data collection encompassed the evaluation of nurses' cognitive understanding regarding delirium, as well as their personal perspectives and encounters in providing care for patients affected by delirium. A web-based self-instructional program was developed, integrating essential components derived from clinical recommendations and pertinent scholarly literature. The module was disseminated to participants via the messaging application, WhatsApp. Posttest assessments were administered to evaluate the level of knowledge on delirium 2 weeks following the dissemination of the module.

Ethical Considerations

The study placed significant emphasis on ethical considerations. The participants were contacted on an individual basis, and the objectives of the study were effectively presented. All participants who were enrolled in the study provided informed consent, signifying their deliberate decision to participate.

Table 1: Demographic characteristics of the participants

Variable	*f (%) or mean (SD)*
Age in years, mean (SD)	34.56 (7.42)
Gender	
Male	26 (30.23)
Female	60 (69.77)
Educational level	
Diploma in nursing	8 (9.3)
Bachelor in nursing	54 (62.1)
Masters in nursing	24 (27.6)
Years of work experience, mean (SD)	11.6 (7.25)
Length of service in years	
1–5 years	16 (18.4)
5–10 years	42 (48.3)
>10 years	28 (32.2)
Special training for delirium management	
Yes	36 (41.4)
No	50 (57.5)
Method of training	
Self-training	44 (51.2)
In-curricular training	56 (65)
In-service training	10 (11.62)
Continuing education	22 (25.58)
Workload	
Caring for 1–2 patients per day in ICUs	34 (39.2)
Caring for 4–8 patients in emergency wards	52 (59.8)

Data Analysis

The statistical analysis was conducted utilizing a statistical package for the social sciences (SPSS) software, version 22. The demographic data were reported in the form of frequency and percentage. An independent test was employed to assess and evaluate the subjective levels of strain experienced by nurses working in both ICUs and emergency wards. The researchers employed a paired *t*-test to assess the difference in mean knowledge scores prior to and following the implementation of the instructional module. The mean difficulty scores for each item in the SCDI were determined on a scale ranging from 1 to 4.

Results

Demographic Characteristics of the Participants

The study sample consisted primarily of female nurses, who constituted 69% of the total responses with a mean age of 34.56 (7.42). The predominant level of educational attainment was at the Bachelor's degree level, accounting for 62.1% of the sample. It is worth noting that there was a considerable variation in the years of work experience among the participants, with an average of 11.6 years. Furthermore, 32.2% of the participants possessed over a decade of professional experience. A considerable proportion of the nurses (37.2%) had undergone specialized training in the management of delirium. The majority of the study participants were belonging to emergency wards caring for 4–8 patients in each shift (59.8%). Table 1 depicts the demographic characteristics of the participants of the study. All nurses worked 8 hours a day on average; the main difference between the nurses working in the normal ward and those in the ICU was the number of patients they were caring for.

Knowledge of the Nurses Regarding Delirium

The level of understanding possessed by nurses with regard to delirium before and after the administration of the instructional module is presented in Table 2. During the pretest, the participants displayed a notable comprehension of prevention and management strategies, as evidenced by a mean score of 9.49 [standard deviation (SD) = 1.98]. However, the participants exhibited only a moderate level of knowledge regarding the presentation of delirium (mean = 6.74, SD = 1.285) and its causes (mean = 7.14, SD = 1.527). This highlights the necessity for focused educational interventions in these specific domains.

Table 2 displays the pretest and posttest knowledge scores of participants pertaining to the appearance, etiology, and prevention techniques of delirium. The scores are represented as the quantity of accurate responses, with the proportion of correct answers indicated within brackets, for each knowledge item.

Table 2: Proportion of the correct response for the delirium knowledge questionnaire among the nurses in the pretest and posttest

	Items	*Pretest knowledge score n (%)*	*Posttest knowledge score n (%)*
Knowledge about the presentation, symptoms and outcomes of delirium			
1	Fluctuation between orientation and disorientation is a typical feature of delirium	86 (100)	86 (100)
2	Symptoms of depression may mimic delirium	62 (72)	79 (91.8)
3	Patients never remember episodes of delirium	60 (69.77)	76 (88.37)
4	Delirium never lasts for more than a few hours	38 (44.2)	84 (97.67)
5	A patient who is lethargic and difficult to rouse does certainly not have a delirium	44 (51. 2)	80 (93)
6	Patients with delirium are always physically and/or verbally aggressive	16 (18.6)	80 (93)
7	Patients with delirium have a higher mortality rate	42 (48.83)	73 (84.8)
8	Behavioral changes in the course of the day are typical of delirium	70 (81.390	80 (93)
9	A patient with delirium is likely to be easily distracted and/or have difficulty following a conversation	84 (97.67)	85 (98.83)
10	Patients with delirium will often experience perceptual disturbances (e.g., visual and/or auditory hallucinations)	78 (90.69)	86 (100)
Knowledge about causes and risk factors of delirium			
11	A patient admitted with pneumonia and having diabetes, visual and auditory disturbances has the same risk for delirium as a patient admitted with pneumonia without comorbidities	44 (41.2)	64 (74.6)
12	The risk for delirium increases with age	74 (86)	74 (86)
13	A patient with impaired vision is at increased risk of delirium	34 (39.54)	80 (93)
14	The greater the number of medications a patient is taking, the greater their risk of delirium	60 (69.76)	60 (69.76)
15	A urinary catheter reduces the risk of delirium	6 (6.9)	72 (83)
16	Poor nutrition increases the risk of delirium	74 (86)	86 (100)
17	Dementia is an important risk factor for delirium	72 (83.72)	70 (81.4)
18	Diabetes is an important risk factor for delirium	58 (67.44)	72 (83.72)
19	Dehydration can be a risk factor for delirium	66 (76.75)	86 (100)
20	Delirium is generally caused by alcohol withdrawal	72 (83.73)	82 (95.34)
21	A family history of dementia predisposes a patient to delirium	54 (62.79)	70 (81.39)
Knowledge about delirium prevention and management strategies			
22	Treatment of delirium always includes sedation	20 (23.25)	79 (91.86)
23	Daily use of the mini-mental state examination (MMSE) is the best way for diagnosing delirium	84 (97.67)	86 (100)
24	Providing as much staff as possible to take care at the patients' bedside is an important strategy in the prevention of delirium	32 (37.2)	86 (100)
25	The use of physical restraints in patients at risk for delirium is the best way to ensure their safety	32 (37.2)	82 (94.35)
26	Encouraging patients to (correctly) wear their visual/hearing aids is necessary to prevent delirium	70 (81.4)	86 (100)
27	Adequate hydration is an important strategy in the prevention of delirium	72 (83.72)	86 (100)
28	The maintenance of a normal sleep–wake cycle (e.g., avoidance of sleep interruption) is an important strategy in the prevention of delirium	84 (97.67)	85 (98.83)
29	The use of haloperidol in preoperative surgical fracture patients is a way to prevent delirium	46 (53.48)	74 (86)

(Contd...)

Table 2: *(Contd...)*

Items		*Pretest knowledge score n (%)*	*Posttest knowledge score n (%)*
30	The stimulation of patients to perform different activities at the same time is a way to prevent delirium	46 (53.48)	84 (97.67)
31	Keeping instructions for patients as simple as possible is important in the prevention of delirium	84 (97.67)	76 (88.4)
32	Early activation/ambulation (e.g., getting patients out of bed as soon as possible) of patients is an important strategy in the prevention of delirium	72 (83.72)	81 (94.2)
33	Providing patients with familiar objects (e.g., photos, clock, and newspaper) is important to prevent sensory deprivation	86 (100)	80 (93)
34	Avoid eye contact in the prevention of delirium because it can be seen as a threat	28 (32.55)	83 (96.5)
35	Keeping oral contact with the patient is an important strategy in the prevention of delirium	60 (69.77)	77 (89.5)

Table 3: Nurses' subjective strain of care when caring for patients with different symptoms of delirium

S.No.	*Subjective strain items*	*Very easy n (%)*	*Easy n (%)*	*Difficult n (%)*	*Very difficult n (%)*
1	How do you find dealing with patients who are withdrawn, unusually quiet?	0	10 (11.6)	54 (62.8)	22 (25.6)
2	How do you find dealing with patients who are apathetic, unmotivated?	2 (2.3)	12 (13.8)	60 (69)	12 (13.80
3	How do you find dealing with patients who have decreased amount of motor activity?	4 (4.6)	24 (27.6)	52 (59.8)	6 (6.9)
4	How do you find dealing with patients who have a lack of knowledge or understanding of their situation or illness?	4 (4.6)	24 (27.6)	42 (48.3)	16 (18.4)
5	How do you find dealing with patients who have difficulty concentrating, are easily distracted?	6 (6.9)	6 (6.9)	58 (66.7)	16 (18.4)
6	How do you find dealing with patients who speak slowly or in a hesitant manner?	14 (16.1)	30 (34.5)	36 (41.4)	6 (6.9)
7	How do you find dealing with patients who show little eye contact?	6 (7)	28 (32.6)	44 (51.2)	8 (9.3)
8	How do you find dealing with patients who show little eye contact/avoiding eye contact?	12 (14)	28 (32.60)	42 (48.80)	4 (4.7)
9	How do you find dealing with patients who recalling incorrect names of familiar people/call someone known to him/her by another name?	6 (6.9)	16 (18.4)	54 (62.1)	10 (11.5)
10	How do you find dealing with patients who talking to someone who is actually not present?	0	10 (11.5)	58 (66.7)	18 (20.7)
11	How do you find dealing with patients who show repetitive behavior?	4 (4.6)	16 (18.4)	50 (57.5)	16 (18.4)
12	How do you find dealing with patients who speak incoherently?	4 (4.6)	12 (13.8)	54 (62.1)	16 (18.4)
13	How do you find dealing with patients who are alternating between clarity and confusion?	4 (4.6)	12 (13.8)	54 (62.1)	16 (18.4)
14	How do you find dealing with patients who have disturbed sleep–wake cycle?	6 (6.9)	16 (18.4)	52 (59.8)	12 (13.8)
15	How do you find dealing with patients who are restless, agitated?	4 (4.6)	12 (13.8)	42 (48.80)	28 (32.2)
16	How do you find dealing with patients who are noisy/yelling/shouting loudly?	6 (6.9)	6 (6.9)	42 (48.80)	32 (36.8)
17	How do you find dealing with patients who are irritable?	6 (6.9)	14 (16.1)	40 (46)	26 (29.9)
18	How do you find dealing with patients who have increased amount of motor activity?	4 (4.7)	14 (16.3)	46 (53.5)	22 (25.3)
19	How do you find dealing with patients who are uncooperative, difficult to manage?	4 (4.7)	10 (11.5)	34 (39.1)	38 (43.7)
20	How do you find dealing with patients who try to get out of bed inappropriately?	6 (6.9)	14 (16.30)	38 (44.2)	28 (32.6)
21	How do you find dealing with patients who are pulling out tubes and tearing out dressings?	2 (2.3)	8 (9.2)	30 (34.9)	46 (53.5)

The intervention led to a considerable improvement in participants' knowledge, as evidenced by an increase in the number of accurate responses across different domains of delirium knowledge.

There was a statistically significant increase in the average overall knowledge regarding delirium among nurses working in medical emergency wards and ICUs, as evidenced by the posttest scores (mean = 29.28 ± 3.4) compared to the pretest scores (mean = 23.28 ± 4.5; $p < 0.001$).

Subjective Strain of Nurses while Caring for Patients with Delirium

Tables 3 and 4 summarize the significant findings from the survey conducted to understand the subjective strain experienced by the nurses in medical emergencies and ICUs when dealing with patients exhibiting diverse behaviors associated with delirium. The majority of respondents (62.1%) indicated they considered dealing with withdrawn and quiet patients to be moderately difficult, whereas

25.3% found it less challenging. In contrast, managing apathetic patients posed extreme difficulty for only 2.3% and moderate difficulty for 69%. The majority of respondents (59.8%) stated that they did not find it challenging in instances involving individuals with reduced motor activity, while 27.6% found it somewhat difficult.

Dealing with patients lacking knowledge posed no significant challenge for 48.3%, with 27.6% finding it moderately difficult. Concentration difficulties were manageable for 66.7%, while 6.9% struggled. In cases involving patients who spoke slowly or hesitantly, 16.1% found it very challenging. Limited eye contact was moderately challenging for 32.6%, and the same percentage found avoidance of eye contact somewhat difficult. Patients recalling incorrect names posed moderate challenges for 18.4%, and 11.5% found conversations with absent individuals moderately difficult. These findings provide insights into the experiences and perceptions of nurses when dealing with these challenging patient behaviors and can inform strategies for improving communication and patient care in clinical settings.

Table 4: Total mean score and mean difference in the subjective strain score of nurses when caring for patients with delirium in ICUs and emergency wards

Subjective strain	*f (%)*	*Mean (SD)*	*t-value (df)*	*p-value*
Total subjective stain		61.465 ± 8.908		
Hypoactive behavior		8.79 ± 1.329		
Mixed level of activity		25.00 ± 4.245		
Hyperactive behavior		27.67 ± 4.926		
ICUs	34 (39.54)	58.118 ± 11.080	**–2.942** (84)**	**0.004**
Emergency wards	52 (60.46)	63.654 ± 6.361		

**$p < 0.01$

The analysis revealed a significant difference in subjective strain between healthcare professionals in ICUs (mean = 58.118, SD = 11.080) and those in emergency wards (mean = 63.654, SD = 6.361), with a *t*-value of –2.942 (*df* = 84) and $p = 0.004$. During the section of the questionnaire related to hypoactive behavior, nurses reported a mean subjective strain score of 8.79 (SD = 1.329). This indicates a relatively low level of strain experienced by nurses when dealing with patients exhibiting hypoactive behavior. In the section involving patients displaying mixed levels of activity, the mean subjective strain score increased to 25.00 (SD = 4.245). This suggests a moderate level of strain experienced by nurses when dealing with patients exhibiting a combination of hypoactive and hyperactive behaviors. During the section of the questionnaire where patients exhibited hyperactive behavior, nurses reported a mean subjective strain score of 27.67 (SD = 4.926). This represents a higher level of strain experienced by nurses when caring for patients displaying hyperactive behavior.

The reported mean score of the subjective burden was 61.465 (SD = 8.908). The overall means of the individual items are outlined in Table 5 indicating that nurses found all types of behaviors somewhat difficult. However, hyperactive/hyperalert behaviors appeared to be the most challenging and were reported as "very difficult" to manage according to a high mean score (3.41).

Table 5 outlines the mean and SD scores of all the individual items within the subscales, in rank order. The top 9 high-scoring items each scored a mean of more than 3, thus indicating that nurses deemed these areas to be difficult to manage. These statements reflect the total components of the questionnaire related to hyperactive/hyperalert behaviors, thus explaining the high mean score for this section. Dealing with patients who are pulling out tubes and tearing out dressings (88.4% reported difficulty) and uncooperative or "difficult to manage" (72% experienced difficulty)

Table 5: Rank order of mean responses to statements of subjective strain score index of nurses when caring for patients with delirium

	Delirium behaviors	*Mean strain score*	*Difficulty rank*
20	Pulling out tubes and tearing out dressings	3.4 ± 0.756	1
18	Uncooperative, and difficult to manage	3.23 ± 0.836	2
15	Noisy/yelling/Shouting loudly	3.16 ± 0.838	3
1	Withdrawn, unusually quiet	3.14 ± 0.597	4
9	Talking to someone who is actually not present	3.09 ± 0.566	5
14	Restless, agitated	3.09 ± 0.806	6
19	Try to get out of bed inappropriately	3.02 ± 0.881	7
16	Irritability	3 ± 0.868	8
17	Have increased amount of motor activity	3 ± 0.782	9
5	Difficulty concentrating, are easily distracted	2.98 ± 0.735	10
2	Apathetic, unmotivated	2.95 ± 0.612	11
11	Speak incoherently	2.95 ± 0.718	12
12	Alternating between clarity and confusion	2.95 ± 0.718	13
10	Repetitive behavior	2.91 ± 0.746	14
4	Lack of knowledge or understanding of their situation or illness	2.81 ± 0.79	15
13	Disturbed sleep–wake cycle	2.81 ± 0.759	16
8	Recalling incorrect names of familiar people/call someone known to him/her by another name	2.79 ± 0.738	17
3	Have decreased amount of motor activity	2.7 ± 0.67	18
7	Little eye contact	2.63 ± 0.752	19
6	Speak slowly or in a hesitant manner	2.4 ± 0.844	20

received the highest overall mean score mean scores of 3.4 and 3.2, respectively. Also reported as difficult to manage was noisy/yelling/shouting loudly (3.16) and "dealing with patients who try to get out of bed inappropriately" (3.02). Other high-scoring items were withdrawn, unusually quiet (3.14), "irritability" (3) and patients who are restless or "agitated" (3.09). In contrast, behaviors such as avoidance and abnormal quietness (mean strain score: 2.38 ± 0.71), mental depression and lack of motivation (mean strain score: 2.38 ± 0.65), and reduced activities (mean strain score: 2.48 ± 0.66) were rated as the least challenging. Notably, item 18 (uncooperative and difficult to manage) consistently emerged as one of the most difficult behaviors across different wards, emphasizing its significant impact on nursing care across various clinical settings.

Discussion

The primary goal of this study was to explore the subjective strain experienced by nurses when caring for patients who were delirious. The results revealed that managing delirium episodes put nurses under greater strain and stress. The study also examined individual behaviors and particular subscales, offering insightful information on the most difficult parts to manage. Notably, the hyperactive/hyperalert subscale showed itself to be the most challenging. The average results for the remaining three subscales likewise showed that nurses had a great amount of trouble controlling these particular delirium-related behaviors.

While prior research has indicated that caring for patients with delirium is stressful for nurses, this study provides a novel insight into the specific burden experienced by nurses in managing delirium cases in India.[11,20,21] Consistent with studies focusing on informal caregivers, nurses across various clinical settings reported increased caregiving burdens associated with hyperactive delirium-related behaviors.[19] Similar to findings among informal caregivers, behaviors that might be perceived as "positive" or aligning with conventional illness conceptualizations, such as hallucinations and interactions with nonexistent individuals, were comparatively easier for nurses to handle. However, this discovery is cause for concern, as patients exhibiting hypoactive symptoms could potentially be overlooked, leading to delayed diagnosis, poorer prognosis, and a heightened risk of developing hospital-acquired infections and pressure sores.[20]

In essence, hyperactive delirium considerably increases the nurses' perceived burden of care.[19] Participants in this study ranked difficult-to-manage and uncooperative patients as contributing the most subjective stress. These patients were thought to be extraordinarily challenging to manage.[11] Interestingly, the majority of delirium patients show hypoactive or mixed levels of activity. Patients who are calm and show substantially reduced movement, however, place the least perceived load on nurses. Delirium in these people is more difficult to diagnose, frequently goes unrecognized, and has a worse prognosis.[19,22]

The study shows the crucial impact of the perceived burden of nurses in their encounters with delirious patients, which may make it more difficult to make a correct diagnosis.[20] Hyperactive behaviors, often negatively perceived, can lead nurses to react forcefully, escalating patients' uncooperative and aggressive behaviors.[23] Limited observational skills raise the possibility of a false diagnosis, which could classify delirium signs as confusion or normal behavior. Nurses may experience emotional and health problems as a result of this stress. The beneficial relationship between education and perceived stress emphasizes the need for focused assistance and education, highlighting the demand for thorough training programs to improve nurses' abilities and emotional fortitude when caring for patients who are delirious.[11,20,22]

The nurses in the emergency wards may have had more delirium patients within the nurse/bed ratio, putting additional subjective strain on their ability to provide care.

A proactive strategy is required to reduce the significant caregiving burden brought on by delirium, beginning with prevention, early detection, and effective treatment. According to prior studies, professionals working with older people and those suffering from dementia must be aware of the increased risk factors that might lead to the development of delirium.[20,22] Additionally, it is essential to improve nurses' knowledge of this illness through regional educational campaigns and in-service training, especially those who work with high-risk groups like the elderly and people with dementia. As a result, improving knowledge and skills is necessary to support preventive and detection initiatives and to adhere to best practices in healthcare.

The multifaceted nature of delirium risk underscores the importance of vigilant monitoring, especially in older individuals and those with dementia, where multiple risk factors heighten the chances of delirium development. A meticulous assessment to identify the underlying cause serves as the foundational step in delirium treatment protocols.[20,24] Nurses play a central role in preventing, detecting, and treating delirium, and a comprehensive understanding of both risk factors and symptoms equips them to fulfill this role effectively, potentially easing the burden of caregiving.[20] Caring for delirious patients places a substantial burden on nurses, impacting care delivery significantly. To alleviate this burden, it is imperative to focus on prevention, early diagnosis, and prompt treatment. Interventions such as orientation techniques, addressing underlying conditions, and appropriate sedation, if necessary, are essential components of delirium management.[24] Patients' understanding of their situation during delirium proves beneficial, enhancing their responses and memory of events. With the ongoing trend of an aging population, nurses across diverse specialties will increasingly encounter delirium cases. Comprehensive training is crucial, especially in long-term care settings where delirium prevalence is high and it often exacerbates dementia symptoms.[25–27]

Compared to previous studies on delirium, the nurses in this research study had a higher knowledge score. Nurses' knowledge of delirium was shown to be poor in the research by Speed and Hamdan–Mansour et al. but it was found to be moderate in the current study—though not as low as it had been in the previously mentioned investigations.[16,17] The results of the current investigation were consistent with those in the study of Speed where they showed a considerable lack of understanding regarding the risk factors linked to the onset of delirium.[16]

The use of the web-based educational intervention resulted in statistically significant variations in knowledge after the intervention program. Our findings support the notion that the educational module can be a useful tool for enhancing nurses' understanding of delirium, which is consistent with other studies.[16,28–30] A previous investigation conducted in three Australian hospitals demonstrated a significant enhancement in nurses' delirium recognition ability through the implementation of e-learning.[28] The positive impact observed in our study aligns with the outcomes of another research endeavor that highlighted the effectiveness of a delirium training program in bolstering nurses' knowledge, self-confidence, and performance.[31] The efficacy of the study intervention can be

attributed to the interactive and dynamic nature of web-based learning, fostering active learner participation. The utilization of audiovisual elements, user-friendly interfaces, provision for posing queries, and the incorporation of up-to-date literature contribute to the effectiveness of interactive e-learning in significantly enhancing nurses' proficiency in recognizing delirium.[32] These collective findings underscore the broad applicability and positive impact of web-based learning methodologies in delirium education for healthcare professionals.

The data analysis revealed that nurses initially encountered challenges in recognizing delirium, but there was a statistically significant improvement in their ability to identify the condition after participating in the web-based learning program. This finding is consistent with the interactive nature of the educational module, encompassing various aspects of delirium, played a crucial role in enhancing nurses' knowledge and skills related to the identification. The posttest assessments underscored a substantial increase in correct identifications of delirium symptoms and manifestations among the participating nurses. Real-life case scenarios, visual representations, and diagnostic guidelines incorporated into the learning program contributed to a more nuanced understanding of delirium-related behaviors, including hyperactive and hypoactive states, as well as the associated risk factors.

It is noteworthy that previous studies consistently highlight the positive impact of educational programs on the mean subjective strain scores of nurses caring for delirium patients. This suggests a promising trend towards alleviating the challenges associated with delirium care through educational interventions. The observed positive effects of e-learning on the strain of care could be attributed to its effectiveness in enhancing nurses' ability to accurately recognize and manage delirium.[31] Drawing parallels, a separate study demonstrated that a 6-week educational program focusing on delirium care significantly reduced stress related to the workload of care delivery to elderly people.[32] It is plausible to infer that the improvement in knowledge, facilitated by the online teaching intervention in our study, may act as a catalyst in reducing subjective strain.[33] By emphasizing early detection and management of delirium, the educational intervention not only contributes to enhanced knowledge but also potentially mitigates subjective strain through proactive prevention strategies. This reinforces the interconnectedness between knowledge improvement and the subsequent reduction in subjective strain, underscoring the comprehensive benefits of the educational intervention.

This shift highlights the efficacy of targeted education in transforming nurses' clinical acumen and diagnostic skills, addressing the initial knowledge gap in delirium identification. The improved ability to identify delirium not only reinforces the positive impact of the educational intervention but also holds implications for enhanced patient care and outcomes. Additionally, a significant difference in the overall delirium knowledge scores before and after the module's administration was discovered. Due to its adjustable training schedule, uniform educational materials, scalability for large audiences, and affordability, our web-based instructional module demonstrates considerable promise in improving delirium diagnosis and knowledge. Given these benefits, the web-based instructional module has been proposed as an alternate learning strategy, particularly for time-constrained healthcare workers. The requirement for self-discipline and the absence of involvement, however, were shown in earlier feasibility studies, which highlights the significance of looking into other forms for the educational module. To achieve significant and lasting improvements in delirium treatment in clinical settings, this larger approach should include enabling and reinforcing techniques in addition to practice restructuring.[27,28]

Limitations

The research was carried out within a certain geographical area, with a restricted sample of 86 nurses. The generalizability of the findings may be limited to a broader population of nurses in different geographical regions or healthcare contexts. The study relies on the self-reported data provided by nurses, which has the potential to be influenced by response bias. The potential for inaccuracies in the results arises from the possibility that participants may have exaggerated their knowledge and experiences or provided responses that align with social norms. The primary emphasis of the study was on the subjective strain of nurses in providing care for patients with delirium, as well as the impact of a web-based training module on enhancing their expertise. Insufficient attention was given to the comprehensive examination of supplementary variables that may influence the experiences of nurses, such as organizational policies, support networks, or specific patient demographics. The study assessed the augmentation of knowledge. The present study assessed the immediate impact of the intervention on participants' knowledge. Assessing the durability of knowledge retention and the practical use of acquired information are crucial factors in establishing the ongoing effectiveness of an educational session. Due to the administration of the survey in the English language, certain participants may encounter challenges in effectively communicating their responses. Furthermore, it is worth noting that while the investigation into this matter remains incomplete, it is possible that regional cultural influences could exert diverse effects on the experiences and attitudes of nurses.

Recommendations

However, it is imperative for future research to overcome the limitations inherent in this study. A comprehensive comprehension of the challenges faced by nurses in the treatment of delirium can be achieved by conducting studies with larger and more diverse samples, employing longitudinal designs to assess the retention of knowledge over an extended period, utilizing qualitative inquiries to capture the intricate nature of experiences, and employing culturally sensitive methodologies. Furthermore, conducting an inquiry into the impact of organizational support and regulatory measures on the experiences of nurses could provide valuable insights for improving the overall quality of delirium treatment in hospital settings.

Conclusion

This study sheds light on the significant gaps in nurses' understanding the management of delirium and the subjective strain experienced by nurses while caring for delirium patients. The implementation of a web-based instructional program demonstrated a positive impact on enhancing nurses' comprehension of delirium management. The findings underscore the importance of specialized training and support systems for nurses caring for patients with delirium. The study emphasizes that hyperactive delirium behaviors, characterized by uncooperative and aggressive conduct, pose a substantial source of subjective stress for nurses. The positive outcomes of the educational intervention indicate the potential of web-based learning as a valuable tool for addressing knowledge deficiencies and improving nurses' competence in delirium care.

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