Original Research Article

Survey of Guideline Compliance and Attitude Toward Symptom Management in Japanese Intensive Care Units

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Shuhei Yamada, MS[1,*], Hideaki Sakuramoto, PhD[2,#], Gen Aikawa, PhD[3,#] and Kazuaki Naya, MS[1,#]

Abstract

Introduction: The Clinical Practice Guideline for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit (ICU) was revised in 2018 to include sleep disruption and immobility. Inadequate management of these symptoms can lead to negative consequences. A 2019 survey in Japan found that the guideline was recognized but needed to be consistently implemented.

Objective: This study aimed to examine compliance with the guideline for symptom management of pain, agitation, delirium, and sleep in Japanese ICUs.

Methods: This study included all ICUs in Japan and asked one representative from each unit to respond to the web survey from January 2022 to February 2022.

Results: Of a potential 643 units, 125 respondents from the ICU were included in the analysis (19.4% response rate). Compared to the guideline's recommendations, (a) pain assessment was performed in 86.3% of patients who could self-report, and in 72.0% of those who could not self-report; (b) agitation and sedation assessment was performed in 99% of patients; (c) only 66.1% of nurses reported assessing sleep quality on the units, and 9.1% performed the subjective sleep quality assessment; (d) the use of the recommended risk factor of the delirium assessment tool was low (9.6%). Additionally, according to the survey respondents, contrary to the guideline, many units administered medications to prevent and treat delirium, and approximately 30% used multiple non-drug interventions. The data are expressed as numbers and percentages. Some datasets were incomplete due to missing values.

Conclusion: Most units used drugs for delirium prevention and treatment, and only a few used non-drug interventions. There is a need to popularize the assessment of sleep and delirium risk factors and use non-drug interventions to promote patient-centered care in the future.

Keywords

Intensive care unit<practice, symptom management, delirium

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Introduction

The Society of Critical Care Medicine published the Clinical Practice Guideline for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit (Barr et al., 2013) in 2013, known as the PAD Guideline In 2018, the PAD guideline was revised to "Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Immobility, and Sleep Disruption in Adult Patients in the ICU," known as PADIS guideline (Devlin et al., 2018).

A survey was conducted in 2019 to identify the current status of pain, restlessness, and delirium management in

[1]Department of Adult Health Nursing, Tokyo Healthcare University Wakayama Faculty of Nursing, Wakayama, Japan
[2]Department of Critical Care and Disaster Nursing, Japanese Red Cross Kyushu International College of Nursing, Fukuoka, Japan
[3]Department of Adult Health Nursing, College of Nursing, Ibaraki Christian University, Ibaraki, Japan

[*]This author contributed equally to this work.
[#]These authors also contributed equally to this work.

Corresponding Author:
Department of Adult Health Nursing, Tokyo Healthcare University Wakayama Faculty of Nursing, Wakayama, Japan
Email: s-yamada@thcu.ac.jp

the ICU in Japan (Committee for the Development of Japanese Guidelines for the Management of Pain, Agitation and Delirium in Intensive Care Unit, Japanese Society of Intensive Care Medicine, 2020). The survey showed that the content of the guideline is recognized, but utilization within the units depends on the level of awareness. The guideline is not disseminated to all staff in the Japanese units.

Review of Literature

Critical patients undergoing ventilator management in the intensive care unit (ICU) receive many interventions perceived as distressing, and most patients complain of pain (Alasad et al., 2015). The short-term consequences of untreated pain include higher energy expenditure and delirium (Breivik, 1998). Furthermore, inadequate pain management and delirium may lead to posttraumatic stress disorder (Myhren et al., 2010) and post-intensive care syndrome (Needham et al., 2012; Elliott et al., 2014). Delirium is associated with prolonged ICU and hospital lengths of stay, prolonged duration of mechanical ventilation, increased risk of premature death, and cognitive impairment up to 18 months after hospital discharge (Cavallazzi et al., 2012; Kotfis et al., 2018; Krewulak et al., 2020; Salluh et al., 2015). "Immobility" and "sleep disruption" are associated with delirium and the long-term prognosis of patients. In addition, unmanaged symptoms, restlessness, and delirium are indicators of discontinuing rehabilitation for "Immobility" (Devlin et al., 2018). Therefore, the symptom management of "Pain," "Agitation," "Delirium," and "Sleep disruption" is of utmost importance in the ICU.

In previous research, it has been reported that, in Japanese hospital units, the content of guidelines related to symptom management in the ICU is recognized. However, their practical implementation within the wards relies on the level of awareness, and the guideline has yet to thoroughly permeate through to all staff. Additionally, in the past survey, no data were collected on drugs used to prevent or treat delirium, and this aspect of the survey remains unclear. A Dutch study examining the adherence to the delirium guideline showed that the recommended items, such as "sedation assessment," "light sedation," and "avoiding benzodiazepines," had declining implementation rates over 5 years (van Bochove-Waardenburg et al., 2023). Therefore, the use of clinical practice guidelines should be evaluated regularly. This study aimed to determine compliance with symptom management based on the PADIS guideline in all Japanese ICUs, regarding their approach to pain, agitation, delirium, and sleep.

Methods

Design

This study used a cross-sectional anonymous web-based survey via SurveyMonkey® to examine the compliance and attitudes toward symptom management based on PADIS Guideline in Japanese ICUs. This survey was conducted from January 30, 2022, to February 16, 2022.

Research Question

This study aimed to address the question: "To what extent does symptom management in Japanese intensive care units comply with recommended guidelines, and what is their attitude toward symptom management?"

Sample

The survey covered all Japanese ICUs on the Ministry of Health, Labour and Welfare's list of notified medical institutions. The researchers sent an online survey to 643 units and requested one nurse at each unit to respond to the survey.

Data Collection

The questionnaires and response sheets for the web survey via SurveyMonkey are shown in Table S1 in Supplemental File. In addition, explanations of the terms used in the questionnaires are shown in S1 Table. This study collected data on ICU characteristics: number of beds, number of staff, approximate median years of nursing experience, ICU setting, and additional medical reimbursement for early mobilization and rehabilitation. In addition, the questionnaire design allowed us to determine if a facility was using the methods recommended in the guideline. The survey contents were related to "pain," "agitation," delirium," and "sleep disruption" according to the guideline (29 items, 5 min). To examine the content and face validity of the questionnaire, it was supervised by the researcher and certified nurse specialist, and was also pretested with ICU staff. This study collected data on the use of a multi-professional approach to symptom management, methods of symptom assessment, and frequency of assessment. For example, the question "Does your department use the Numeric Rating Scale (NRS) or the Visual Analog Scale (VAS) to grade pain in patients who are able to self-report?" Additionally, this study also collected data on preventive and treatment strategies for "delirium." With regard to "sleep disruption," patients were asked how they assessed the quality of their sleep. For "immobility," the researchers collected data on whether or not an additional fee was obtained to know whether or not there was a specialized team for early rehabilitation. When the responses were submitted, these data were anonymized, and the researchers did not handle any personally identifiable information.

PADIS Guideline Description

The PADIS guideline, which stands for Pain, Agitation, Delirium, Immobility, and Sleep, is a comprehensive clinical practice guideline designed to address the management of

critically ill patients in the Intensive Care Unit (ICU). Developed to enhance patient care and outcomes, it focuses on optimizing the management of symptoms and promoting a patient-centered approach.

Ethical Approval

Electronic consent was obtained using a web survey. Respondents reviewed the survey objectives listed at the beginning of the survey and answered questions that allowed them to express their consent. This online survey was designed to be completed only if the respondent provided consent. The study was approved by the Hokkaido University of Science's Ethics Review Board (ID 587).

Statistical Analysis

The data are expressed as numbers and percentages. Some datasets were incomplete due to missing values. Thus, the number of denominators varied in each analysis. All statistical analyses were performed with EZR ver. 4.3.0 (Saitama Medical Center, Jichi Medical University, Saitama, Japan), which is a graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria). More precisely, it is a modified version of R commander designed to add statistical functions frequently used in biostatistics.

Results

Sample Characteristics

This study obtained 150 responses out of a potential 643 units (24.0% response rate). Of these, 25 respondents were excluded (some datasets were incomplete due to missing values). Thus, responses from nurses working in ICUs in 125 units were included in the analysis (19.4% valid response rate).

Table 1. Characteristics of Japanese Intensive Care Units to Which Respondents Belong.

Variable	n	%
Number of beds	125	
<6	45	36.0
7–12	47	37.6
13–18	18	14.4
19–24	4	3.2
>25	5	4.0
Missing	6	4.8
Number of staff	125	
<19	16	12.8
20–29	38	30.4
30–39	38	30.4
40–49	10	8.0
50–59	12	9.6
>60	7	5.6
Missing	4	5.6
Years of nursing experience (approximate median)	125	
<3 years	4	3.2
4–5 years	30	24.0
6–10 years	66	52.8
>10 years	24	19.2
Missing	1	0.8
ICU setting	125	
Closed ICU	9	7.2
Semi-Closed ICU	27	21.6
Semi-Open ICU	23	18.4
Open ICU	59	47.2
Missing	7	5.6
Facility with additional medical reimbursement for early mobilization and rehabilitation	125	
Obtained	99	79.2
Not obtained	26	20.8

ICU, intensive care unit.

Table 2. Compliance and Attitudes Regarding Pain Management in the ICU in Japan.

Variable	n	%
Pain control in a multi-professional practice	125	
Yes	110	88.0
No	15	12.0
Method of pain assessment (Patients who can express their will)	125	
NRS[a]	98	79.0
VAS[b]	9	7.3
BPS[c]	9	7.3
CPOT[d]	1	0.8
Not using scale	6	4.8
Others	1	0.8
Method of pain assessment (Patients who are unable to express their will)	125	
NRS	10	8.0
VAS	7	5.6
BPS	47	37.6
CPOT	43	34.4
Not using scale	16	12.8
Others	2	1.6
Frequency of pain assessment	125	
Once a day	2	1.6
Twice a day	9	7.2
Every 8 hours	8	6.4
Every 4 hours	21	16.8
Every 2 hours	44	35.2
Not done routinely	31	24.8
Others	10	8.0

[a]NRS: Numerical Rating Scale.
[b]VAS: Visual Analog Scale.
[c]BPS: Behavioral Pain Scale.
[d]CPOT: Critical-Care Pain Observation Tool.
ICU, intensive care unit.

The characteristics of the ICUs in Japan from which the nurses responded in this survey are shown in Table 1. Of these, 99 (79.2%) units were considered to have specialized rehabilitation teams.

Compliance and Attitudes Regarding "Pain Management"

The rate of guideline compliance and attitudes toward pain management is shown in Table 2. According to the survey respondents, pain control in 88.0% of the ICUs was managed through a multidisciplinary practice. Of the patients who could self-report, 86.3% assessed pain using the NRS or VAS as recommended in the PADIS guideline. For patients who could not self-report, 72.0% assessed pain using the Behavioral Pain Scale or Critical-Care Pain Observation Tool recommended in the PADIS guideline.

Compliance and Attitudes Regarding "Agitation and Sedation Management"

The responses to guideline compliance and attitude toward agitation and sedation management are shown in Table 3. According to the survey respondents, sedative management in 86.4% of ICUs was involved in a multi-disciplinary practice, and in 99.9% of Japanese ICUs, the depth of sedation was assessed using the Richmond Agitation Sedation Scale, as recommended in the PADIS guideline.

Table 3. Compliance and Attitudes Regarding Agitation and Sedation Management in the ICU in Japan.

Variable	n	%
Sedative control in a multi-professional practice	125	
Yes	108	86.4
No	16	12.8
Missing	1	0.8
Method of agitation and sedation assessment	125	
RASS[a]	124	99.9
MAAS[b]	1	0.1
Not using scale	0	0.0
Frequency of agitation and sedation assessment	125	
Once a day	2	1.6
Twice a day	6	4.8
Every 8 hours	84	67.2
Every 4 hours	0	0.0
Every 2 hours	0	0.0
Not done routinely	22	17.6
Others	11	8.8

[a]RASS: Richmond Agitation Sedation Scale.
[b]MASS: Motor Activity Assessment Scale.
ICU, intensive care unit.

Table 4. Compliance and Attitudes Regarding Delirium Management in the ICU[a] in Japan.

Variable	n	%
Assessment of risk factors for delirium	125	
Evaluated	94	75.2
Not evaluated	17	13.6
Missing	14	11.2
Method of Assessment of risk factors for delirium*	94	
PRE-DELIRIC model[b]	4	4.3
Early-PRE-DELIRIC model[c]	5	5.3
Original scale in units	32	34.0
Not using scale	29	30.9
Others	21	22.3
Method of delirium assessment	125	
CAM-ICU[d]	62	49.6
ICDSC[e]	37	29.6
Not evaluated	5	4.0
Others	8	6.4
Missing	13	10.4
Frequency of delirium assessment	125	
Once a day	14	11.2
Twice a day	22	17.6
Every 8 hours	38	30.4
Every 4 hours	11	8.8
Every 2 hours	8	6.4
Not done routinely	0	0.0
Others	15	12.0
Missing	13	10.4
Drugs used for the **prevention** of delirium	125	
Haloperidol	55	44
Dexmedetomidine	75	60
Drugs not used	13	10.4
Others	20	16.0
Non-drug interventions implemented for the purpose of **preventing** delirium	125	
High-intensity light therapy	8	6.4
Providing information and guidance about delirium in advance	62	49.6
Use of clocks	93	74.4
Reduction of sedation	69	55.2
Early rehabilitation and mobilization	96	76.8
Use of hearing aids and glasses	75	60.0
ABCDE bundle	42	33.6
Not implemented	2	1.6
Others	12	9.6
Drugs used for the **treatment** of delirium	125	
Haloperidol	84	67.2
Dexmedetomidine	79	63.2
Drugs not used ※	6	4.8
Others	25	20.0
Non-drug interventions implemented for the purpose of **treating** delirium	125	
High-intensity light therapy	5	4
Providing information and guidance about delirium in advance	50	40
Use of clocks	96	76.8
Reduction of sedation	84	67.2

(continued)

Table 4. Continued.

Variable	n	%
Early rehabilitation and mobilization	100	80.0
Use of hearing aids and glasses	77	61.6
ABCDE bundle[f]	39	31.2
Not implemented	1	0.8
Others	14	11.2

[a]ICU, intensive care unit.
bPRE-DELIRIC model: PREdiction of DELIRimu for Intensive Care patients model.
[c]Early-PRE-DELIRIC model: Early PREdiction of DELIRium for Intensive Care patients model.
[d]CAM-ICU: Confusion Assessment Method for the Intensive Care Unit.
[e]ICDSC: Intensive Care Delirium Screening Checklist.
[f]ABCDE bundle: The Awakening and Breathing Coordination, Delirium Monitoring/Management, and Early Exercise/Mobility bundle.

Compliance and Attitudes Regarding "Delirium Management"

The responses to guideline compliance and attitude toward delirium management are indicated in Table 4. According to the survey respondents, risk factors for delirium in 75.2% of ICUs were assessed. However, only 9.6% of the units used the PRE-DELIRIC model or the Early-PRE-DELIRIC model recommended in the PADIS guideline. In contrast, the use of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) and Intensive Care Delirium Screening Checklist (ICDSC) recommended in the PADIS guideline for the evaluation of delirium was 79.2%. Several drugs, such as haloperidol, were used for delirium prevention, and the treatment of delirium was similar. The main non-drug prevention and treatment strategies were "early rehabilitation/mobilization," "use of clocks," and "use of hearing aids or glasses." Regarding the incidence rate of delirium, 15.5% (17) of the units reported a delirium incidence rate of less than 10%, 35.5% (39) experienced a delirium incidence rate of 10–40%, 11.8% (13) experienced a delirium incidence rate of 40–60%, and 0.9% (1) experienced a delirium incidence rate of over 70%. However, 36.4% (40) of the units did not know or measure the incidence rate of delirium. The ranking of important risk factors for delirium as perceived by nurses is shown in Table S2 in Supplemental file.

Compliance and Attitudes Regarding "Sleep Disruption Management"

The responses to guideline compliance and attitude toward sleep disruption management are shown in Table 5. According to the survey respondents, sleep medication in 10.5% of ICUs was managed solely by a physician or nurse, without multidisciplinary practice. Sleep quality was assessed in 66.1% of the units, of which 70.1% either asked patients about their sleep or used one of the validated assessment tools, such as the Richards-Campbell Sleep Questionnaire.

Table 5. Compliance and Attitudes Regarding Sleep Disruption Management in the ICU in Japan.

Variable	n	%
Sleep medication control in a multi-professional practice	125	
Yes	112	89.5
No	13	10.4
Sleep quality assessment	125	
Evaluated	82	65.6
Not Evaluated	42	33.6
Missing	1	0.8
Method of sleep quality assessment*	82	
Using a scale (RCSQ[a], Sleep-VAS)	7	9.1
Not using a scale but questioning the patient	47	61.0
Assessing with objective information (Observation, number of awakenings, etc.)	22	28.6
Others	6	7.8

[a]RCSQ: Richards Campbell Sleep Questionnaire.

Discussion

This study revealed four major findings. First, the majority of survey respondents complied with the use of the guideline for assessing pain, agitation, and delirium. However, approximately half of the ICU units were insufficiently compliant with sleep assessments. Additionally, the utilization rate of the recommended risk factor assessment tools for delirium was low (10%). Second, many units used drugs to prevent delirium, although the guideline did not recommend pharmacological strategies.

Third, haloperidol, clearly discouraged for delirium treatment, was used in more than half of the units. Fourth, multifaceted non-drug interventions, such as the ABCDE bundle as recommended in the guideline, were introduced in around 30% of the units.

Relationship to Previous Studies

Many tools are available for objectively assessing pain, sedation, and delirium. However, there is no objective assessment tool for sleep, and subjective assessment by the patient may have hindered accurate sleep assessment. RCSQ, which is recommended for sleep assessment, uses subjective data and is therefore heavily influenced by the patient's clinical condition. The use of rating scales for pain, sedation, and delirium in Japan has been reported to be high (pain: 84.9%, sedation: 97.4%, delirium: 79.6%) (Committee for the Development of Japanese Guidelines for the Management of Pain, Agitation and Delirium in Intensive Care Unit, Japanese Society of Intensive Care Medicine,

2020), similar to the present study. Therefore, the nurse can evaluate these scales objectively and unaffected by the patient's clinical condition.

Although risk factor assessments for delirium were performed in many units, only a few units used the delirium predictive tool recommended in the PADIS guideline. The PADIS guideline recommends the PREdiction of DELIRium in ICU patients (PRE-DELIRIC) model and the Early-PRE-DELIRIC (E-PRE-DELIRIC) model as delirium predictive models (Devlin et al., 2018). The PRE-DELIRIC model is calculated using data from 10 predictors (age, APACHE-II score, admission category, emergency admission, infection, coma, sedation, morphine, urea value, and metabolic acidosis) within 24 h of ICU admission (van den Boogaard et al., 2014). A previous study reported that the E-PRE-DELIC model is more useful because it can predict the risk of delirium using data immediately after ICU admission (Wassenaar et al., 2018). Both models are multifactorial, have complex formulas, and are therefore not easily used at the bedside. Furthermore, using these models primarily relies on automated calculations in electronic health records, and there are barriers to risk factor assessment using these models. For example, these models increase the nurses' workload, which hinders their use in routine clinical management (Linkaitė et al., 2018). Therefore, it is possible that the models recommended in the guideline have not been utilized to assess risk factors for delirium. Future research is needed to develop bedside tools or establish an inexpensive system that facilitates the introduction of both models.

Implications for Practice

In Japan, prophylactic or therapeutic drugs for delirium are widely used compared to non-drug interventions, although they are not recommended in the guideline. This high drug use is consistent with Japan's pharmaceutical spending, which is among the highest globally (OECD, 2021). The high drug use may be related to the low drug prescription barriers in Japan's universal health insurance system. In this survey, the percentage of units that did not use drugs to prevent delirium was low (10.4%). In contrast, only approximately 30% of the units were using recommended multifaceted non-drug interventions, suggesting a preference for symptom management with drugs in Japan. However, 52.5% of respondents in a 2016 survey (Committee for the Development of Japanese Guideline for the Management of Pain, Agitation and Delirium in Intensive Care Unit, Japanese Society of Intensive Care Medicine, 2017) and 69.3% in a 2019 survey (Committee for the Development of Japanese Guideline for the Management of Pain, Agitation and Delirium in Intensive Care Unit, Japanese Society of Intensive Care Medicine, 2020) stated that they did not use pharmacological interventions, a discrepancy from the results of the present study. This may be due to differences in survey methods. Notable, the previous study (Committee for the Development of Japanese Guideline for the Management of Pain, Agitation and Delirium in Intensive Care Unit, Japanese Society of Intensive Care Medicine, 2017; Committee for the Development of Japanese Guideline for the Management of Pain, Agitation and Delirium in Intensive Care Unit, Japanese Society of Intensive Care Medicine, 2020) was a web survey, which may have biased the respondents' backgrounds. This survey covered all ICUs in Japan, and thus these results may be more indicative of the current situation in Japan.

The PADIS guideline was published in 2019 and has been disseminated through conferences and conference websites. Their content is slowly gaining recognition. However, their adoption among nurses is limited, and additional educational support is required. Furthermore, although the symptom management methods recommended by the guideline will increase the workload for managers, the incentives provided are quite limited. Specifically, non-drug interventions are not eligible for insurance coverage points. This is partly due to the low level of supporting evidence. Future education and dissemination of the guideline, including more detailed surveys of actual drug use and non-drug interventions, are needed.

Strengths and Limitations

Two limitations in this study should be acknowledged. First, this survey had a low valid response rate of only 19.4%. Therefore, these results cannot be directly attributed to the compliance of Japanese ICUs. However, this study summarizes data from 125 Japanese ICUs without duplicating respondents' facilities; thus, it better represents the current situation than previous studies conducted via a web survey do. In contrast to previous studies, the survey was distributed to all ICUs in Japan; consequently, there was a clear population.

Second, these results are subject to self-selection bias by responders from ICUs with a specific interest in symptom management. Therefore, this study may have overrepresentation, which decreases the generalizability of the findings.

Conclusions

This study's survey demonstrates the current practice of managing pain, agitation, delirium, and sleep in Japanese ICUs. The majority complied with the guideline for assessing pain, agitation, and delirium, but not for assessing sleep. In addition, risk factors for delirium were rarely evaluated. Furthermore, most centers administered drugs for delirium prevention and treatment, which is not recommended, and few multifaceted non-drug interventions were used. Assessment of sleep and delirium risk factors and non-drug interventions need to be popularized to promote patient-centered care in the future.

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Author Contribution

SY: Study design. SY: Data collection. SY: Statistical analysis. SY, HS, GA and KN: Manuscript documentation. SY: Conceptualization. All authors read and approved the final manuscript.

Competing Interests

The authors have declared that no competing interests exist.

Data Availability

All relevant data are within the manuscript and its Supporting Information files.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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ORCID iDs

Shuhei Yamada https://orcid.org/0009-0000-9767-8616
Kazuaki Naya https://orcid.org/0000-0001-7591-0736

Supplemental Material

Supplemental material for this article is available online.

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