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Research on attitudes of senior anesthesia assistants and intensive care physicians towards compliance with the "pain, agitation/sedation, immobility, and sleep disruption" guidelines and symptom management in the intensive care units in Türkiye

Türkiye'deki yoğun bakım ünitelerinde kıdemli anestezi asistanı ve yoğun bakım hekimlerinin "ağrı, ajitasyon/sedasyon, hareketsizlik ve uyku bozulması" kılavuzuna uyum ve semptom yönetimine ilişkin tutumları üzerine bir araştırma

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ABSTRACT

Introduction: It was aimed to investigate the attitudes of senior anesthesia assistants and intensive care physicians in Türkiye towards compliance with the "Pain, Agitation/Sedation, Immobility and Sleep Disruption" (PADIS) Guidelines and symptom management in the intensive care unit (ICU).

Methods: The survey, consisting of 40 questions was sent to the participants electronically. The answers to the questions were evaluated according to the recommendations in the PADIS 2018 guidelines.

Results: While anesthesiology and reanimation specialists gave less compatible answers (58.9%) with the guideline in "identifying risk factors affecting pain"; responses were more consistent with the guideline (100%, 69.5%, and 85.3%, respectively) in "use of medication in addition to opioids", "use of medication to prevent delirium", and "pharmacological interventions to improve sleep"

Discussion and Conclusion: This study demonstrates that intensive care physicians, including anesthesiology and reanimation assistants in Türkiye, generally exhibit a compatible attitude with the PADIS 2018 guideline in the management of "pain, agitation/sedation, delirium, immobility and sleep disruption" symptoms in critically ill adults in the ICU. Additionally, as the medicine career progresses, more guideline-compliant responses in the management of some symptoms have demonstrated the importance of clinical experience in critically ill adults management.

Keywords: PADIS, pain, agitation, sedation, delirium, immobility, sleep disruption, survey

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ÖZ

Amaç: Türkiye'de kıdemli anestezi asistanları ve yoğun bakım hekimlerinin yoğun bakım ünitesinde (YBÜ) "Ağrı, Ajitasyon/Sedasyon, İmmobilite ve Uyku Bozukluğu" (PADIS) Kılavuzuna uyum ve semptom yönetimine yönelik tutumlarının araştırılması amaçlandı.

Yöntem: 40 sorudan oluşan anket katılımcılara elektronik ortamda gönderildi. Sorulara verilen cevaplar PADIS 2018 kılavuzundaki önerilere göre değerlendirildi.

Bulgular: Anesteziyoloji ve reanimasyon uzmanları "ağrıyı etkileyen risk faktörlerinin belirlenmesi" konusunda kılavuza daha az (%58,9) uyumlu yanıtlar verirken; "opioidlere ek olarak ilaç kullanımı", "deliryumu önlemek için ilaç kullanımı" ve "uykuyu iyileştirmeye yönelik farmakolojik müdahaleler" konularında kılavuzla daha tutarlı yanıtlar verdi (sırasıyla %100, %69,5 ve %85,3).

Tartışma ve Sonuç: Bu çalışma, Türkiye'de anesteziyoloji ve reanimasyon asistanları da dahil olmak üzere yoğun bakım hekimlerinin, yoğun bakımdaki yetişkin kritik hastalarda "ağrı, ajitasyon/sedasyon, deliryum, hareketsizlik ve uyku bozukluğu" semptomlarının yönetiminde PADIS 2018 kılavuzuna genel olarak uyumlu bir tutum sergilediğini göstermektedir. Ek olarak, tıp kariyeri ilerledikçe, bazı semptomların tedavisinde kılavuzlarla daha uyumlu yanıtların alınması, kritik hastalığı olan yetişkinlerin yönetiminde klinik deneyimin önemini ortaya koymuştur.

Anahtar kelimeler: PADIS, ağrı, ajitasyon, sedasyon, deliryum, immobilite, uyku bozulması, anket

Introduction

Given the characteristics of critically ill adults, such as mental status changes, use of invasive procedures and devices, sleep disturbances, and immobility, the approach to pain assessment and management is crucial (1). Pain in the intensive care unit (ICU) occurs during routine procedures that are not adequately considered, such as patient positioning, endotracheal tube suctioning, chest tube removal, arterial or venous line placement, or wound care (2). Structured pain management in the ICU may be important for the patient and the provider institution (3).

Critically ill adults who receive mechanical ventilation for a long time are exposed to negative experiences such as fear, anxiety, pain, insomnia, helplessness, weight loss and loneliness (4). Sedative agents are frequently administered to critically ill adults to relieve anxiety, reduce the stress of mechanical ventilation, and prevent harm due to agitation (5). Analgesia and sedation are effective in critically ill patients, yet excessive sedation is associated with prolonged mechanical ventilation and ICU stay. Analgesia and sedation are associated with a high rate of delirium, increased mortality, longer hospital stay, higher hospital costs, and long-term adverse outcomes in poorly managed critically ill adults (6,7).

Delirium is common in critically ill adults and is associated with prolonged ICU stay and long-term cognitive impairment. Although delirium has previously been often overlooked, physicians are becoming increasingly aware of the vital role that acute brain dysfunction plays in the course and subsequent outcomes of critical illness. Combined pain, agitation, and delirium protocols appear to improve outcomes in critically ill adults and may reduce the incidence of delirium (8).

Survivors of critical illness often live with many long-term sequelae, such as ICU-induced muscle weakness (ICU-AW). ICU-AW may be found in 25-50% of critically ill adults (9). Additionally, there are important relationships between analgesia and sedation practices and pain and sedation status regarding patients' participation in rehabilitation/mobilization in the ICU. Early mobilization of critically ill adults through selected rehabilitation strategies has been demonstrated in many studies to shorten hospital stay, reduce the incidence of delirium, increase the number of ventilator-free days, and improve physical condition (10,11).

Poor quality sleep is a common source of distress for critically ill patients (4). Sleep disturbance is hypothesized to contribute to delirium in the ICU (12), prolonged mechanical ventilation (13), immunosuppression (14), and neurocognitive impairment (3). The PADIS 2018 Clinical Practice Guidelines provide a roadmap for the development of patient-centered and evidence-based protocols (3).

Building on the Pain, Agitation, and Delirium (PAD) Guideline published by the Society of Critical Care Medicine (SCCM) in 2013, the PADIS 2018 guideline includes a number of methodological innovations, including input from critical illness survivors. In addition to the PAD guideline, it also addresses challenges and offers recommendations regarding immobility and sleep disorder management (15). This study aimed to investigate the attitudes of senior anesthesia assistants and intensive care physicians in Türkiye towards compliance with the PADIS guideline and symptom management in the ICU.

Materials and Methods

This study was carried out between 15 October 2023 and 15 January 2024, after receiving the approval of Hatay Mustafa Kemal University Non-Interventional Clinical Research Ethics Committee (approval date: October 12, 2023, number: 19). A preliminary study was carried out by applying the created survey questions to 15 people who were not included in the study, in order to ensure the understandability of the survey. Survey data collection was achieved through an electronic data form. The survey was sent electronically to 1200 senior anesthesia assistants (AR-A), anesthesiology and reanimation specialists (AR-S), intensive care specialists (IC-S) and intensive care assistants (IC-A) whose e-mail addresses were known. It was also directly communicated to the participants at the 57th Turkish Anesthesiology and Reanimation Congress (TARK2023), which was held in November 2-5, 2023.

The survey consisted of three parts and 40 questions. The first part consisted of participants' demographic information, the second part included the participants' institutional information, and the third part consisted of questions that evaluated the suitability of the participants' attitudes towards the PADIS symptoms in intensive care patients according to the recommendations of the PADIS 2018 guidelines. The survey was prepared in the form of a Google Form (Annex-1) and presented to the participants in a virtual environment, and their consent to participate in the survey was obtained with the help of the survey. "Senior anesthesia assistant" was defined as anesthesiology and reanimation specialist student who completed their 3rd year. Sample size in the study: Since an online response was expected from all individuals of the population (physicians working in ICU), the highest rate (50%) was taken into account in the response distribution, and by estimating a tolerable error of 7%, it was concluded that the sample size should be 190 intensive care physicians with 95% confidence.

Responses to the survey questions were evaluated according to the PADIS 2018 guideline recommendations (3):

Pain management

1. "Do you have a protocol-based (analgesedation) pain assessment and management program in the care of critically ill adults?" The answer "Yes" to the question was considered as compatible with the guideline.

2. "Are the risk factors (anxiety, depression, young age, comorbidity, pain intensity before the procedure, underlying diagnoses, etc.) that affect pain both at rest and during the procedure (thoracic tube insertion, etc.) in critically ill adults determined?" The answer "Yes" to the question was considered as compatible with the guideline.

3. "What is the pain scale you use in communicative critically ill adults?" The answers "Numeric Rating Scale, Visual Analog Scale, Verbal Descriptor Scale" to the question were considered as compatible with the guideline.

4. "What is the pain scale you use in critically ill adults who cannot communicate?" The answers "Behavioral Pain Scale, Critical-Care Pain Observation Tool" to the question were considered as compatible with the guideline.

5. "When appropriate and the patient cannot self-report, are family and loved ones included in the pain assessment process?" The answer "Yes" to the question was considered as compatible with the guideline.

6. "Are vital signs used in pain evaluation?" The answer "It is used as a clue to initiate the evaluation using valid pain assessment methods" to the question was considered as compatible with the guideline.

7. "Can you specify any medications you use in addition to opioids for pain management (to reduce pain intensity and opioid consumption) in critically ill adults?" The answers "Acetaminophen, Ketamine, and Gabapentin, Carbamazepine or Pregabalin for the treatment of neuropathic pain" to the question were considered as compatible with the guideline.

8. "What pharmacological agents do you use for pain management during bedside interventional procedures in critically ill adults?" The answers "The lowest effective dose of opioid and NSAID (IV, oral or rectal)" to the question were considered as compatible with the guideline.

9. "Which of the non-pharmacological methods do you use for pain management in critically ill adults?" The answers "Massage (in suitable patients), Music therapy (for pain due to intervention or not), Cold Application, Relaxation techniques (such as breathing exercises)" to the question were considered as compatible with the guideline.

Agitation/sedation management

10. "What is your preferred type of sedation in mechanically ventilated critically ill adults?" The answer "Light sedation" to the question was considered as compatible with the guideline.

11. "Which sedative agent do you use for sedation in adults receiving mechanical ventilation after cardiac surgery?" The answer "Propofol" to the question was considered as compatible with the guideline.

12. "Which is your primary preferred sedative agent for sedation in critically ill adults (non-cardiac surgery)?" The answers "Propofol and Dexmedetomidine" to the question were considered as compatible with the guideline.

Delirium management

13. "Is there routine evaluation for delirium risk factors in critically ill adults after admission to the ICU?" The answers other than "Not evaluated" to the question were considered as compatible with the guideline.

14. "What scale do you use to monitor delirium in critically ill adults?" The answers other than "Routine delirium monitoring is not performed" to the question were considered as compatible with the guideline.

15. "Do you use pharmacological agents (haloperidol, atypical antipsychotic, dexmedetomidine, statin, ketamine, etc.) to prevent delirium in critically ill adults?" The answer "No" to the question was considered as compatible with the guideline.

16. "Do you use a pharmacological agent (haloperidol, atypical antipsychotic, etc.) to treat Subsyndromal delirium (ICDSC 1-3) in critically ill adults?" The answer "No" to the question was considered as compatible with the guideline.

17. "Do you use pharmacological agents (haloperidol, atypical antipsychotic, dexmedetomidine, statin, ketamine, etc.) to treat delirium in critically ill adults?" The answer "Not routinely used" to the question was considered as compatible with the guideline.

18. "Do you use dexmedetomidine in critically ill adults with delirium when agitation prevents weaning from mechanical ventilation?" The answer "Yes" to the question was considered as compatible with the guideline.

19. "Do you use non-pharmacological methods to reduce delirium?" The answer "Multi-component (Improving sleep, reducing sedation, mobilization, improving hearing or vision)" to the question was considered as compatible with the guideline.

Immobility management

20. "Do you implement a mobilization or rehabilitation program for critically ill adults?" The answer "Yes" to the question was considered as compatible with the guideline.

Sleep management

21. "Do you provide non-pharmacological interventions to improve sleep in critically ill adults?" The answers "Assisted Controlled Ventilation mode selection at night, NIV use at night in patients requiring NIV, Noise and light reduction" to the question were considered as compatible with the guideline.

22. "Do you use pharmacological interventions to improve sleep in critically ill adults?" The answer "No" to the question was considered as compatible with the guideline.

23. "Do you use a sleep-promoting protocol (earplugs, eye shields, relaxing music, etc.) in critically ill adults?" The answer "Yes" to the question was considered as compatible with the guideline.

In this study, the data were evaluated with the SPSS-27 (Statistical Package For The Social Sciences, IBM, USA) program. According to the answers given to the survey, frequency and percentage from descriptive statistics were used. Since all the answers examined were categorical variables, means and standard deviations were not used. The relationship between categorical variations was examined with the chi-square test. For all calculations, the significance limit was accepted as $p<0.05$. The adjusted p value was accepted as $0.05/8=0.00625$ in the post-hoc calculation of the chi-square test. The p value of the hypothesis was obtained by calculating the chi-square distribution $X^2 = \Sigma ((O\_i - E\_i)^2 / E\_i)$ for 1 degree of freedom and the Adjusted Residual calculated by SPSS.

Results

Demographic characteristics of the participants and hospital characteristics were listed in Table 1.

PADIS 2018 guideline compliance assessments

1. Pain management

It was found that physicians' response rates compatible with the guideline were respectively 68.9% in "protocol-based pain management", 68.4% in "evaluation of pain risk factors", 88.9% in "use of pain assessment scale in patients with whom communication can be established", 69.5%, in "use of pain assessment scale in patients with whom communication can not be established". 33.7% in "participation in pain assessment of family and loved ones", 28.4% in "use of vital signs in pain assessment", 94.7% in "use of drugs in addition to opioids", 77.4% in "use of pharmacological agents in interventional procedures", and 31.7% in "non-pharmacological agent use in pain management" (Table 2).

When examining how the answers given were affected by the medicine career, in "identifying the risk factors affecting pain", AR-A gave 75.2%, IC-A 100% and IC-S 100% compatible answers, while AR-S gave 58.9% less consistent answers with the guideline (adjusted $p<0.00625$). While IC-S gave 100%, AR-A 89.4% and IC-A 80% responses compatible with the guideline regarding "use of drugs in addition to opioid", AR-S gave 100% answers that were significantly more compatible with the guideline (adjusted $p<0.00625$). These results were statistically significant ($p<0.05$; Table 2). Other answers regarding pain management did not change according to medicine career ($p>0.05$; Table 2).

Table 1. Demographic data, hospital and intensive care characteristics

Variables	What is your medical career?				
	AR-A	AR-S	IC-A	IC-S	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
Age (year)					
20-30	52 (61,2)	2 (2,1)	2 (40)	0 (0)	56 (29,5)
31-40	33 (38,8)	54 (56,8)	3 (60)	1 (20)	91 (47,9)
41-50	0 (0)	34 (35,8)	0 (0)	2 (40)	36 (18,9)
51-60	0 (0)	5 (5,3)	0 (0)	1 (20)	6 (3,2)
60+	0 (0)	0 (0)	0 (0)	1 (20)	1 (0,5)
Gender					
Male	52 (61,2)	49 (51,6)	5 (100)	5 (100)	111 (59,4)
Female	33 (38,8)	46 (48,4)	0 (0)	0 (0)	79 (41,6)
Branch					
Anesthesiology and Reanimation	85 (100)	95 (100)	0 (0)	4 (80)	184 (96,8)
Internal Medicine	0 (0)	0 (0)	5 (100)	1 (20)	6 (3,1)
Intensive care experience (year)					
0-2	67 (78,8)	2 (2,1)	3 (60)	0 (0)	72 (37,9)
3-5	16 (18,8)	40 (42,1)	1 (20)	0 (0)	57 (30,0)
6-10	2 (2,4)	39 (41,1)	1 (20)	3 (60)	45 (23,7)
11-20	0 (0)	13 (13,7)	0 (0)	0 (0)	13 (6,8)
20+	0 (0)	1 (1,1)	0 (0)	2 (40)	3 (1,6)
Type of hospital					
University	52 (61,2)	9 (9,5)	5 (100)	3 (60)	69 (36,3)
State	3 (3,5)	62 (65,3)	0 (0)	1 (20)	66 (34,7)
Training and Research	30 (35,3)	22 (23,2)	0 (0)	1 (20)	53 (27,8)
Private	0 (0)	2 (2,1)	0 (0)	0 (0)	2 (1,1)
ICU type					
Anesthesiology and Reanimation	84 (98,8)	52 (54,7)	0 (0)	4 (80)	140 (73,6)
Mixed	0 (0)	44 (46,3)	0 (0)	0 (0)	44 (23,2)
Internal Medicine	1 (1,2)	0 (0)	5 (100)	1 (20)	6 (3,2)
ICU level					
Level 1	1 (1,2)	0 (0)	0 (0)	0 (0)	1 (0,5)
Level 2	3 (3,5)	39 (41,1)	0 (0)	1 (20)	43 (22,6)
Level 3	81 (95,3)	56 (58,9)	5 (100)	4 (80)	146 (76,8)
Number of ICU beds					
0-10	22 (25,9)	25 (26,3)	2 (40)	1 (20)	50 (26,3)
10-20	50 (58,8)	55 (57,9)	3 (60)	1 (20)	109 (57,4)
20-30	13 (15,3)	10 (10,5)	0 (0)	3 (60)	26 (13,7)
30-40	0 (0)	3 (3,2)	0 (0)	0 (0)	3 (1,6)
40+	0 (0)	2 (2,1)	0 (0)	0 (0)	2 (1,1)
Number of patients per nurse in a shift					
1	2 (2,4)	1 (1,1)	0 (0)	0 (0)	3 (1,6)
2	45 (52,9)	52 (54,7)	3 (60)	4 (80)	104 (54,7)
3	36 (42,3)	39 (41,1)	2 (40)	1 (20)	78 (41,1)
4	2 (2,4)	2 (2,1)	0 (0)	0 (0)	4 (2,1)
5	0 (0)	1 (1,1)	0 (0)	0 (0)	1 (0,5)
Medical career	85 (44,7)	95 (50)	5 (2,6)	5 (2,6)	190

Abbreviations; AR-A= Anesthesiology and Reanimation Assistant, AR-S= Anesthesiology and Reanimation Specialist, IC-A= Intensive Care Assistant, IC-S= Intensive Care Specialist. Categorical variables are expressed as n and %.

Table 2. Evaluation of pain management according to medical career**

Medical career		AR-A	AR-S	IC-A	IC-S	Total	p
		n (%)	n (%)	n (%)	n (%)	n (%)	
Protocol based management	GR	56 (65,9)	66 (69,5)	4 (80)	5 (100)	131 (68,9)	0,404
	nonGR	29 (34,1)	29 (30,5)	1 (20)	0 (0)	59 (31,1)	
Identifying risk factors	GR	64 (75,3)	56 (58,9)	5 (100)	5 (100)	130 (68,4)	**0,015***/ b1
	nonGR	21 (24,7)	39 (41,1)	0 (0)	0 (0)	60 (31,6)	
Use of scales in patients who can communicate	GR	71 (83,5)	89 (93,7)	4 (80)	5 (100)	169 (88,9)	0,125
	nonGR	14 (16,5)	6 (6,3)	1 (20)	0 (0)	21 (11,1)	
Use of scales in patients who cannot communicate	GR	59 (69,4)	65 (68,4)	4 (80)	4 (80)	132 (69,5)	0,903
	nonGR	26 (30,6)	30 (31,6)	1 (20)	1 (20)	58 (30,5)	
Family involvement in the pain assessment process	GR	29 (34,1)	29 (30,5)	3 (60)	3 (60)	64 (33,7)	0,317
	nonGR	56 (65,9)	66 (69,5)	2 (40)	2 (40)	126 (66,3)	
Use of vital signs as a clue in pain assessment	GR	24 (28,2	26 (27,4)	1 (20)	3 (60)	54 (28,4)	0,444
	nonGR	61 (71,8	69 (72,6)	4 (80)	2 (40)	136 (71,6)	
Use of analgesics in addition to opioids	GR	76 (89,4	95 (100)	4 (80)	5 (100)	180 (94,7)	**0,006***/b2
	nonGR	9 (10,6	0 (0)	1 (20)	0 (0)	10 (5,3)	
Pharmacological agents used in interventional procedures	GR	72 (84,7	68 (71,6)	3 (60)	4 (80)	147 (77,4)	0,150
	nonGR	13 (15,3	27 (28,4)	2 (40)	1 (20)	43 (22,6)	
Non-pharmacological method used	GR	27 (32,1	29 (31,5)	2 (40)	1 (20)	59 (31,7)	0,922
	nonGR	57 (67,9	63 (68,5)	3 (60)	4 (80)	127 (68,3)	

Abbreviations; AR-A= Anesthesiology and Reanimation Assistant, AR-S= Anesthesiology and Reanimation Specialist, IC-A= Intensive Care Assistant, IC-S= Intensive Care Specialist. Categorical variables are expressed as n and %. GR=Guideline-compliant response, nonGR=non-guideline response. Categorical variables are expressed as n and %. *p<0.05 was considered statistically significant. **Chi-square test. b1: Bonferroni correction, adjusted p<0.00625, AR-S group creating the statistical difference. b2: AR-A and AR-S groups that make up the statistical difference.

2. Agitation/sedation management

It was found that physicians' response rates compatible with the guideline were respectively %64,2 in "sedation depth preference", 22.2% in "sedative agent selection after cardiac surgery" and 83.2% in "sedative agent selection in non-cardiac surgery patients". When the relationship between agitation/sedation management compliance with the guideline and medicine career was evaluated, no statistically significant difference was found (p>0.05; Table 3).

1. Delirium management

It was found that physicians' response rates compatible with the guideline were respectively 33.2% in "assessment of delirium risk factors", 41.6% in "delirium monitoring", 60.5% in "use of pharmacologic agent to prevent delirium", 66.3% in " pharmacologic agent use in subsyndromal delirium", 55.8% in "routine use of pharmacologic agent for the treatment of delirium", 89.4% in "use of dexmedetomidine when agitation caused by delirium prevents weaning from mechanical ventilation", and 71.6% in "use of non-pharmacological methods to reduce delirium" (Table 4).

When examining how the answers given were affected by the medical career, it was found that in "use of medication to prevent delirium" AR-S of 69.4%, IC-S of 80%, AR-A of 50.5%, and IC-A of 40% responded in accordance with the guideline. These results were statistically significant (p<0.05; Table 4). No significant results were found in the post-hoc analysis. It can be said that this situation arised from the answers given by the AR-A and AR-S groups, which gave results closest to significance and had equal p values. No significant change was observed in the answers to other questions according to medicine career (p>0.05; Table 4).

Table 3. Evaluation of agitation/sedation management according to medical career*

Medical career		AR-A	AR-S	IC-A	IC-S	Total	p
		n (%)	n (%)	n (%)	n (%)	n (%)	
Sedation depth preference	GR	53 (62,4)	59 (62,1)	5 (100)	5 (100)	122 (64,2)	0,117
	nonGR	32 (37,6)	36 (37,9)	0 (0)	0 (0)	68 (35,8)	
Sedative agent preference after cardiac surgery	GR	23 (27,4)	16 (16,8)	2 (40)	1 (20)	42 (22,2)	0,282
	nonGR	61 (72,6)	79 (85,2)	3 (60)	4 (80)	147 (77,8)	
Sedative agent preference for non-cardiac surgery	GR	71 (83,5)	80 (84,2)	3 (60)	4 (80)	158 (83,2)	0,565
	nonGR	14 (16,5)	15 (15,8)	2 (40)	1 (20)	32 (16,8)	

Abbreviations; AR-A= Anesthesiology and Reanimation Assistant, AR-S= Anesthesiology and Reanimation Specialist, IC-A= Intensive Care Assistant, IC-S= Intensive Care Specialist. Categorical variables are expressed as n and %. GR=Guideline-compliant response, nonGR=non-guideline response. Categorical variables are expressed as n and %. *Chi-square test. p<0.05 was considered statistically significant.

Table 4. Evaluation of delirium management according to medical career**

Medical career		AR-A	AR-S	IC-A	IC-S	Total	p
		n (%)	n (%)	n (%)	n (%)	n (%)	
Risk factors assessment	GR	26 (30,6)	31 (32,6)	3 (60)	3 (60)	63 (33,2)	0,319
	nonGR	59 (70,9)	64 (67,4)	2 (40)	2 (40)	127 (66,8)	
Delirium monitoring	GR	35 (41,2)	37 (38,9)	3 (60)	4 (80)	79 (41,6)	0,260
	nonGR	50 (58,8)	58 (61,1)	2 (40)	1 (20)	111 (58,4)	
Use of pharmacological agents to prevent delirium	GR	43 (50,6)	66 (69,5)	2 (40)	4 (80)	115 (60,5)	0,039*
	nonGR	42 (49,4)	29 (30,5)	3 (60)	1 (20)	75 (39,5)	
Use of pharmacological agents for subsyndromal delirium	GR	58 (68,2)	63 (66,3)	2 (40)	3 (60)	126 (66,3)	0,619
	nonGR	27 (31,8)	32 (33,7)	3 (60)	2 (40)	64 (33,7)	
Use of pharmacological agents to treat delirium	GR	48 (56,5)	53 (55,8)	2 (40)	3 (60)	106 (55,8)	0,906
	nonGR	37 (43,5)	42 (44,2)	3 (60)	2 (40)	84 (44,2)	
Use of dexmedetomidine when agitation prevents weaning	GR	76 (90,6)	81 (85,3)	0 (0)	0 (0)	168 (89,4)	0,701
	nonGR	8 (9,4)	14 (14,6)	5 (100)	5 (100)	22 (11,6)	
Non-pharmacological methods to reduce delirium	GR	58 (68,2)	72 (75,8)	3 (60)	3 (60)	136 (71,6)	0,582
	nonGR	27 (31,8)	23 (24,2)	2 (40)	2 (40)	54 (28,4)	

Abbreviations; AR-A= Anesthesiology and Reanimation Assistant, AR-S= Anesthesiology and Reanimation Specialist, IC-A= Intensive Care Assistant, IC-S= Intensive Care Specialist. Categorical variables are expressed as n and %. GR=Guideline-compliant response, nonGR=non-guideline response. Categorical variables are expressed as n and %. *p<0.05 was considered statistically significant. **Chi-square test.

4. Immobility management

It was found that 89.5% of the physicians gave answers in line with the guideline in "implementing a mobilization program". It was observed that the answers given did not vary according to medicine career. (p>0.05; Table 5).

5. Sleep management

It was observed that physicians gave answers compatible with the guideline at a rate of 84.2% for "non-pharmacological interventions to improve sleep", 72.6% for "pharmacological interventions" and 35.3% for "use of sleep-promoting protocol" (Table 5).

When examining how the answers given were affected by the medicine career, 60% of IC-S, 62.3% of AR-A, and 20% of IC-A gave answers compatible with the guideline regarding "pharmacological interventions to improve sleep". AR-S, on the other hand, gave answers that were more compatible with the guideline at a rate of 85.3% (adjusted p<0.00625), and these results were statistically significant (p<0.05; Table 5). Other answers regarding the management of sleep

Table 5. Evaluation of immobility and sleep disorder management according to medical career**

Medical career		AR-A	AR-S	IC-A	IC-S	Total	p
		n (%)	n (%)	n (%)	n (%)	n (%)	
Use of mobilization program	GR	76 (89,4)	84 (88,4)	5 (100)	5 (100)	170 (89,5)	0,732
	nonGR	9 (10,6)	11 (11,6)	0 (0)	0 (0)	20 (10,5)	
Non-pharmacological interventions to improve sleep	GR	67 (78,8)	84 (88,4)	4 (80)	5 (100	160 (84,2)	0,248
	nonGR	18 (21,2)	11 (11,6)	1 (20)	0 (0)	30 (15,8)	
Pharmacological interventions to improve sleep	GR	53 (62,3)	81 (85,3)	1 (20)	3 (60)	138 (72,6)	**0,002***/b
	nonGR	31 (37,7)	14 (14,7)	4 (80)	2 (40)	51 (26,8)	
Use of sleep promoting protocol	GR	30 (35,3)	36 (37,9)	0 (0)	1 (20)	67 (35,3)	0,573
	nonGR	54 (64,7)	59 (62,1)	5 (100)	4 (80)	122 (64,7)	

Abbreviations; AR-A= Anesthesiology and Reanimation Assistant, AR-S= Anesthesiology and Reanimation Specialist, IC-A= Intensive Care Assistant, IC-S= Intensive Care Specialist. Categorical variables are expressed as n and %. GR=Guideline-compliant response, nonGR=non-guideline response. Categorical variables are expressed as n and %. *p<0.05 was considered statistically significant. **Chi-square test. b: Bonferroni correction, adjusted p<0.00625, AR-S group creating the statistical difference.

disruptions did not vary according to medical career (p>0.05; Table 5).

Situations that make the difference

In the post hoc analysis using Bonferroni correction, the adjusted p value was determined as 0.00625. Adjusted p values were calculated for each variable. The difference in the answers to the questions "Pharmacological interventions to improve sleep" and "Identification of risk factors affecting pain" resulted from the answers given by the AR-S group, whose adjusted p values gave significant results. It was found that the difference in the answers given to the question "Drugs used in addition to opioids" was due to the answers given by the AR-A and AR-S groups, whose adjusted p values gave significant results (p <0.00625). No significant results were found in the answer to the question "Use of pharmacological agents to prevent delirium". In this case, it can be said that it is due to the answers given by the AR-A and AR-S groups, which gave the closest result to significance and had equal p values.

Discussion

Prevention and management of ICU problems are vital to optimizing the immediate and long-term recovery and outcomes of critically ill adults by minimizing distress caused by PADIS symptoms in critical patient care. The PADIS 2018 guideline provides updated information on the prevention and management of PADIS symptoms in adult ICU patients and does so using an integrated, evidence-based, multidisciplinary ICU protocol (16). In the literature research, there are very few studies revealing physicians' attitudes in the management of PADIS symptoms. In this study, the compliance of intensive care physicians in Türkiye with the PADIS guideline in symptom management was investigated. The majority of physicians participating in the study were from the branches of anesthesiology and reanimation, and it was observed that they generally complied well with the guidelines in the management of PADIS symptoms. In pain management, a high rate of guideline compliance was noted in "protocol-based management", "identification of risk factors", "use of rating scales" and "use of pharmacological agents", while a low rate of guideline compliance was observed in "participation of family members in pain assessment", "use of vital signs", and " use of non-pharmacological method". Although guideline compliance rates were high in "depth of sedation" and "sedative agent selection in non-cardiac surgery patients", this rate remained low in "sedative agent preference after cardiac surgery". While physicians stated very high compliance rates with the guideline in the use of "pharmacological agents" and "non-pharmacological methods" in delirium management, this rate remained low in

"identification of risk factors" and "delirium follow-up". There were very high guideline-concordant responses in "use of mobilization program" in immobilization management. Regarding sleep management, there was high guideline compliance in "pharmacological" and "nonpharmacological interventions", while less compliance was seen in "sleep-promoting protocols". Although a significant relationship between medical career and guideline compliance could not be detected in general, guideline compliance was higher among physicians experienced in "use of drugs in addition to opioids" in pain management, "use of pharmacological drugs to prevent delirium" and "pharmacological interventions to improve sleep". In addition, it was found that AR-Ss were less compliant with the guideline in "evaluation of risk factors affecting pain". The results of this study, which was conducted only in Türkiye, emphasize the importance of clinical experience in symptom evaluation and management according to the PADIS guideline.

The SCCM recommends the routine use of valid and reliable assessment tools to monitor symptoms of pain, agitation/sedation, and delirium (3). Recent studies have also suggested that utilizing a guideline-based comprehensive questionnaire could lead to improved outcomes among critically ill adults (17,18).

This study demonstrates that attitudes towards compliance with the PADIS guideline and symptom management in the ICU change, especially as physicians' careers progress, and that this change is especially evident in the taking of pharmacological measures. These findings may guide education and policy development efforts to encourage critical care teams to be more aware of symptom management and stricter adherence to PADIS guidelines.

While studies have shown that pain and sedation assessments can be reliably conducted in brain-injured patients (19), barriers to routine implementation exist because physicians may perceive these patients as having impaired consciousness (20). In a previous study, diverse monitoring and treatment protocols were shown to be implemented for patients admitted to the ICU based on whether they had neurological or non-neurological conditions (21). The findings in this study provide important insights into how pain management and assessment are addressed in the ICU. There were differences between AR-A, AR-S, IC-A and IC-S groups regarding pain management protocols and determination of risk factors. In pain management, guideline-compliant responses on "identification of risk factors affecting pain" and "drugs used in addition to opioids" differed significantly between different medicine career groups. This demonstrates the diversity of approaches to pain assessment and management at different stages of medical education and across different disciplines within the critical care specialty. In particular, in more experienced groups such as AR-S and IC-S, compliance with the guideline on "medication in addition to opioids" was more common. These results highlight the need to adopt guideline even in more complex pain management scenarios.

Despite physicians' dedication to pain relief, they may encounter difficulties in accurately documenting pain levels and inadvertently undertreat their patients by underestimating the severity of their pain. A common but detrimental belief is that individuals who do not show outward signs of pain do not actually experience pain that necessitates treatment. Another harmful scenario is the tendency of physicians and nurses to believe that patients frequently exaggerate their pain (22). In the PADIS 2018 guideline, it is stated that family and loved ones can be included in the pain assessment process when appropriate and when the patient cannot self-report. It was observed that the contribution of the families of critically ill adults to the pain assessment was 33.7% in the clinical practices of the physicians participating in this study. Involving patients and their families directly may be a key initial strategy in combating these detrimental beliefs and enhancing pain management practices.

Payen et al. discovered that the rates of sedation (43%) and analgesia (42%) assessments in ICUs were notably lower compared to the administration rates

of sedatives (72%) and opioids (90%) (23). This lack of compliance, resulting in excessive treatment and a lack of awareness, is concerning due to the known risks associated with sedatives and opioids and their well-documented side effects (3). Standardized assessments are essential to ensure improved alignment between the needs for analgesics and sedatives and clinical practices (24). In this study, the use of protocol-based (analgesedation) pain assessment and management program was 68.9%, and there was no significant difference between medical careers. In addition, the preference for light sedation in mechanically ventilated patients was compatible with the guideline with a rate of 64.2% and did not change with the medical career. These results emphasize that routine protocol use should be encouraged in ICUs in Türkiye to first assess patients' pain status and then evaluate the need for sedation.

Intensive care physicians' compliance with the PADIS guideline and their attitudes towards delirium management are of critical importance in the ICU (25). This study reveals the extent to which physicians comply with the recommendations of the PADIS guideline, such as routinely evaluating delirium risk factors, using scales for delirium, and using pharmacological and non-pharmacological methods. Findings demonstrated a significant difference in compliance with the PADIS guideline "use of pharmacological agents to prevent delirium" as the medical career progresses. This suggests that as career level increases, physicians comply more with the guideline on delirium prevention or prefer certain approaches. On the other hand, "routine evaluation of delirium risk factors", "delirium follow-up", "use of pharmacological/non-pharmacological methods to reduce/treat delirium" did not show a significant difference according to medical career levels. This suggests that specific delirium management practices are similar across all medical career stages.

Early mobilization and intensive care rehabilitation are important parts of the PADIS evaluation. In critically ill adults in the ICU, peripheral muscle weakness begins very early and and they lose significant amount of muscle mass (26). There are concerns among ICU staff about early mobilization since critically ill adults have various tools such as ventilators, arterial and central venous lines. Studies have shown that patients on ventilators, continuous renal replacement therapy, or extracorporeal membrane oxygenation devices can be rehabilitated safely and without serious harm (26). In this context, in the survey conducted, the rate of mobilization or rehabilitation program application in critically ill adults was 89.5%, and no significant difference was found according to medical career levels. This result shows that there is a general awareness and acceptance among physicians about the importance of early mobilization and rehabilitation. The consistent approaches of physicians at different career levels on this issue may be an indication that a standardized approach has been adopted regarding the early mobilization and rehabilitation of patients in the ICU. This consistency may play a critical role in enabling patients to achieve better clinical outcomes in the ICU and better functional status in the long term.

Sleep assessment is inherently subjective, thus it is difficult to evaluate in the ICU setting. Since communication with patients is not possible, clear information about the rest they perceive and the factors that disturb them cannot be obtained. Therefore, nighttime rest is often overlooked and forgotten by healthcare professionals. Assessing sleep in patients in the ICU is a complex duty and studies report that polysomnography is the gold standard for sleep assessment (27). Although there is no recommendation for routine use of sleep monitoring in the PADIS guideline, the rate of sleep monitoring among the physicians who participated in our survey was 72.8%. It is stated that the factors that disrupt sleep in ICU patients have been identified in many studies. These are environmental, pharmacological and mechanical ventilation-related factors (18,28). It was observed that 65.8% of the physicians participating in this study evaluated the "factors affecting sleep quality" in the ICU admission of critically ill adults. It was found that 84.2% of the physicians gave answers

in line with the guideline in "non-pharmacological method applications to improve sleep", and this did not change between medical careers. Although the relationship between sleep disruption and important outcomes such as delirium occurrence, duration of mechanical ventilation, length of stay in the ICU and mortality has not been fully established, these results demonstrate that there is awareness of sleep disruption in the ICU.

This study offers a broad perspective regarding compliance with intensive care protocols, including different medicine career levels, but this also brings with it certain limitations. Firstly, having a wide range of participants, from assistant physicians to intensive care specialists, allows making comparisons between physicians at different career stages in terms of compliance with the guidelines. However, the fact that there are 85 anesthesia assistants, 95 anesthesia and reanimation specialists, 5 intensive care assistants and 5 intensive care specialists creates an imbalance in the sample distribution, which may affect the general validity of the results. Secondly, the single-center (national) nature of the study is another factor that limits the broad applicability of the findings. Considering that different geographical and institutional practices are possible factors that may influence guideline adherence, a multicenter (international) study design may provide more generalizable results. Thirdly, the study carries a risk of bias due to the subjectivity of physicians' evaluations of themselves and their practices. Finally, the cross-sectional design of the study limits the ability to detect cause-effect relationships and does not allow for causal interpretations of the results. Longitudinal studies over time can provide a better understanding of trends in guideline compliance and changes in practice over time. Such studies can help us examine in more detail the developments in intensive care practice and the effects of these developments on patients' recovery processes. Therefore, it may be recommended that future research have a multicenter and longitudinal design with more homogeneous participant groups, taking into account the limitations noted in this study.

In conclusion, this study demonstrated that intensive care physicians, including anesthesiology and reanimation assistants in Türkiye, exhibited generally compatible attitudes with the PADIS 2018 guideline in the management of "pain, agitation/sedation, delirium, immobility, and sleep disruption" symptoms in critically ill adults in the ICU. Additionally, as the medicine career increased, more consistent responses were given to the guideline in the management of some symptoms. This demonstrated the importance of clinical experience in the management of critically ill adults.

Ethical approval

This study has been approved by the Hatay Mustafa Kemal University Non-Interventional Clinical Research Ethics Committee (approval date: October 12, 2023, number: 19). Written informed consent was obtained from the participants.

Author contribution

Study conception and design: MSD, MSÇ; data collection: MSD, MSÇ, OK, SH, SU, SH; analysis and interpretation of results: MSD, MSÇ, OK, SH; draft manuscript preparation: MSD, MSÇ, SU, SH. The author(s) reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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