



Sedation Practices and Preferences of Turkish Intensive Care Physicians: A National Survey

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Abstract

Objective: Sedation is one of the most common practices applied in the intensive care units (ICUs), and the management of sedation, analgesia and delirium is a quality measure in the ICUs. Several guidelines on sedation had been published, and many surveys investigated the practices of sedation in the ICUs, but knowledge on the sedation practices in Turkey is lacking. The aim of the present study was to provide baseline knowledge on the sedation practices and preferences of Turkish intensive care physicians and to establish some points to be improved.

Methods: An electronic survey form consisting of 34 questions was generated and posted to email addresses. The survey included questions about demographics and practices on sedation, analgesia, neuromuscular blockage and delirium.

Results: Of 1700 email addresses, 429 (25.0%) were returned. Sedation was practised by 98.0% of the respondents, and mechanical ventilation was indicated as the primary indication (94.0%) for sedation. The presence of a written sedation protocol was 37.0%. For drug choices for sedation, midazolam was the most preferred agent (90.0%). With regard to pain questions, the most commonly used evaluation tool was Visual Analogue Scale (69.0%), and the most preferred drug was tramadol. Nearly half of the participants routinely evaluated delirium and used the confusion assessment method in the ICU.

Conclusion: The results of this survey have indicated some areas to be improved, and a national guideline should be prepared taking pain, agitation and delirium in focus. ClinicalTrials.gov ID: NCT03488069.

Keywords: Intensive care unit, practice, sedation, survey

Introduction

Sedation is one of the most common practices applied in the intensive care units (ICUs). Sedation along with analgesia is administered to patients to improve patient comfort, reduce stress response, facilitate life support and provide amnesia. In addition to its widespread use, providing an optimal level of sedation is complicated, and practices and preferences may vary among different countries and institutions. A systematic review aiming to investigate the incidence of sub-optimal sedation in the ICUs suggested that in most of the studies, 30%-60% of the patients were over sedated (1). Oversedation, on the other hand, is associated with short- and long-term complications and unfavourable outcomes (2, 3).

Currently, the management of sedation, analgesia and delirium is a quality measure in the ICUs (4). Several intensive care societies published guidelines regarding the use of sedatives and analgesics recently (5, 6). These guidelines brought several changes to the practice of sedation, shifting focus to analgesia, preventing delirium and providing lighter levels of sedation by the use of written protocols and sedation scales.

There are many survey studies investigating the practices of sedation in the ICUs of different countries (7). However, knowledge of the sedation practices of intensive care physicians in Turkey is lacking. The aim of the present study was to provide baseline knowledge on the sedation practices and preferences of Turkish intensive care physicians and to establish some points to be improved.

Methods

This national survey study and questionnaire was approved by the institutional ethics committee of İstanbul University-Cerrahpaşa, Cerrahpaşa School of Medicine (approval no. 261075, date: 07.07.2017). This trial had not been registered to the Clinical Trials before enrolment as the study only included physicians and was not considered as a clinical trial. Thereafter, registration was completed (ClinicalTrials.gov ID: NCT03488069). The CONSORT (www.consort-statement.org) guidelines were followed in study conduct.

An electronic survey form consisting of 34 questions was generated using Google forms (<https://docs.google.com/forms>) after a literature search with search words 'sedation', 'practice' and 'survey'.

The first part of the form included questions about demographics, intensive care and hospital characteristics. The second part contained questions on choices and routines of sedation administration, in which multiple choices could be indicated (Appendix A).

The questions were first pilot tested for misunderstandings with the ICU physicians in two ICUs, and the link for the survey was posted to all email addresses registered in the Turkish Society of Intensive Care member database (1700 members) on 2.8.2017. A second notification was sent to the same email addresses on 16.10.2017 with a notice of not to reply to the survey if it was replied after the first email. Participation in the survey was voluntary and anonymous, and there was no compensation for participation.

Accepting responses to the survey was stopped in 11.01.2017, and answers were downloaded from the website.

Statistical analysis

The answers were analysed using Excel spreadsheets (Microsoft Corp., Redmond, WA, USA). Demographic data are expressed as mean \pm SD and counts and percentages. The answers regarding sedation practices are expressed as counts and percentages. No statistical comparisons had been made as this was a descriptive study.

Results

Of the 1700 mail recipients, all physicians working in the ICUs, 429 completed the survey form, making the response rate to be 25% (Figure 1). The mean age of the responders was 39.80 ± 7.53 years, and 259 of them were women. Table 1 shows the demographic and hospital characteristics.

In the survey, 96% of the respondents indicated that they practised sedation in their ICUs. When asked for the indi-

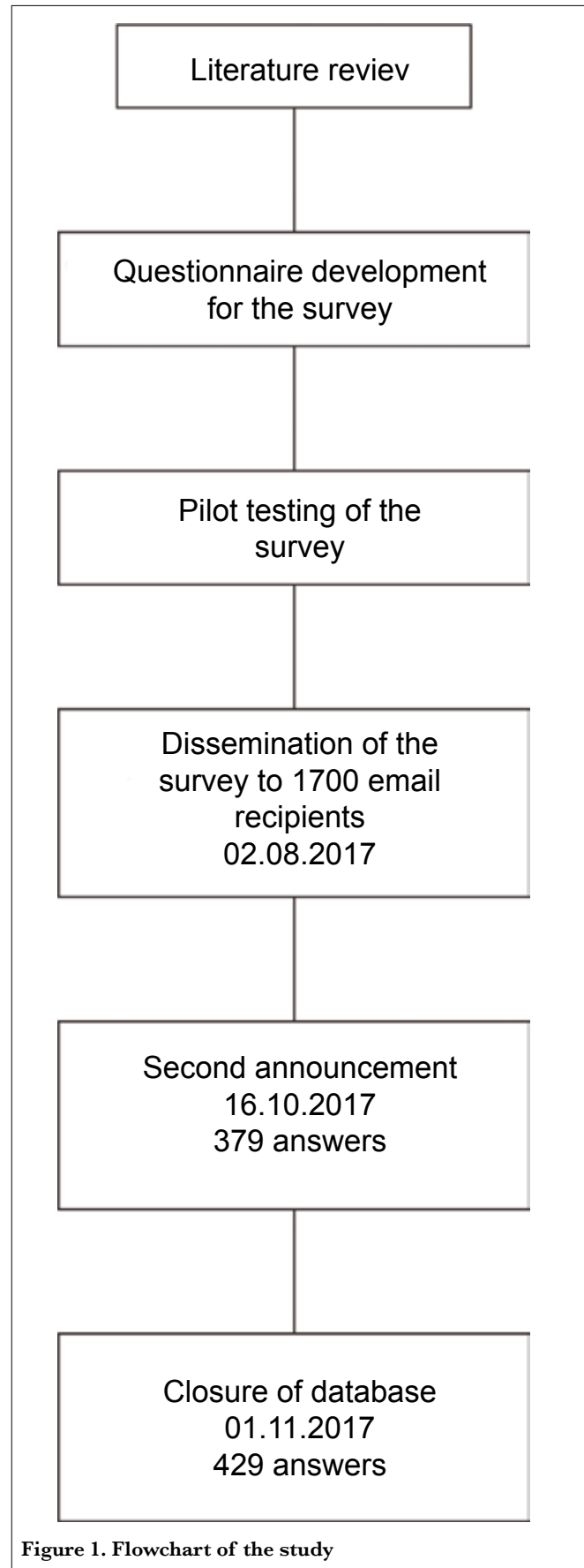


Figure 1. Flowchart of the study

cations for sedation, mechanical ventilation was checked as the primary indication (94%), and 99.5% applied sedation on patients with invasive mechanical ventilation (Table 2).

On the question regarding drug choices for sedation, midazolam was the most preferred agent (90%) either alone or in combination with other drugs. Of the respondents, 69% chose propofol, and the use of dexmedetomidine was 61%. Figure 2 shows the drug choices of the respondents.

Table 3 illustrates the answers of physicians to the questions regarding routine sedation practices. In 97% of the answers, pain treatment was indicated as routine, whereas 63% routinely evaluated pain. Of those who indicated routine pain assessment, evaluation tools were Visual Analogue Scale (VAS) (n=187, 69.0%), Behavioural Pain Scale (BPS) (n=50, 18.5%), Critical Care Pain Observation Tool (n=43, 15.9%), Numeric Rating Scale (NRS) (n=37, 13.7%) and other (n=11, 4.1%).

Table 1. Demographic and hospital characteristics.	
Median age (min-max)	40 (29-63)
Sex (% women)	60.8
Median years spent working in the ICU (min-max)	7 (1-30)
Hospital type (%)	
State university hospital	34.5
State teaching and research hospital	31.0
State hospital	15.7
Private university hospital	4.5
Private hospital	14.3
Median size of the ICU (beds, min-max)	16 (4-104)
ICU type (%)	
Closed ICU	65.5
Open ICU	13.4
Mixed ICU	21.1
Level of the ICU (%)	
Level 3	85.2
Level 2	11.3
Level 1	3.5
Specialty of the responsible physician in the ICU (%)	
Anaesthesiology and reanimation	59.2
Intensive care medicine	36.5
Internal medicine	1.2
Pulmonary medicine	0.5
Surgery	0.2
Cardiology	0.5
Other	1.9
ICU: intensive care unit	

Table 2. Indications for sedation (412 responses)	
Question	n (%)
Routine assessment of sedation level (407 responses)	
Yes	298 (73.2)
No	109 (26.8)
Sedation assessment intervals (324 responses)	
Hourly	89 (27.5)
Every 3 h	63 (19.4)
Every 6 h	81 (25.0)
Every 12 h	41 (12.7)
Daily	50 (15.4)
Sedation assessment tools (308 responses)	
Ramsay Sedation Scale	177 (57.5)
Richmond Agitation and Sedation Scale	91 (29.5)
Riker Sedation Analgesia Scale	5 (1.6)
Adaptation to The Intensive Care Environment Scale	5 (1.6)
Inova Sedation Scale	3 (1.0)
Pasero Opioid-induced Sedation Scale	1 (0.3)
Other	26 (8.4)
Daily determined sedation target (409 responses)	
Yes	261 (63.8)
No	148 (36.2)
Monitorization of sedation level (408 responses)	
Yes	52 (12.7)
No	356 (87.3)
Tools for monitorization of sedation level (52 responses)	
Bispectral index	35 (67.3)
Electroencephalogram	6 (11.5)
Other	19 (36.5)
Daily sedation interruptions (406 responses)	
Yes	290 (71.4)
No	116 (28.6)
Presence of written sedation protocols (407 responses)	
Yes	152 (37.3)
No	255 (62.7)
Execution of sedation protocol (380 responses)	
Physician	310 (81.6)
Nurse	70 (18.4)
Screening the sedation level (389 responses)	
Physician	245 (63.0)
Nurse	144 (37.0)

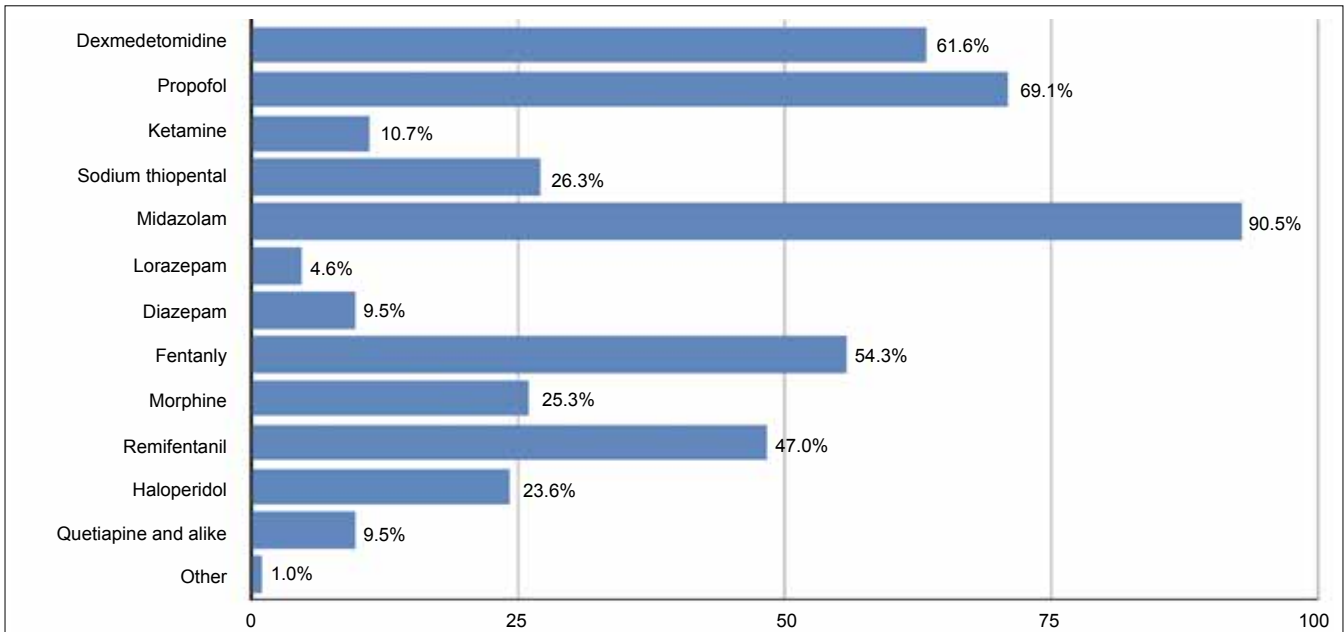


Figure 2. Drug choices for sedation (more than one drug could be chosen)

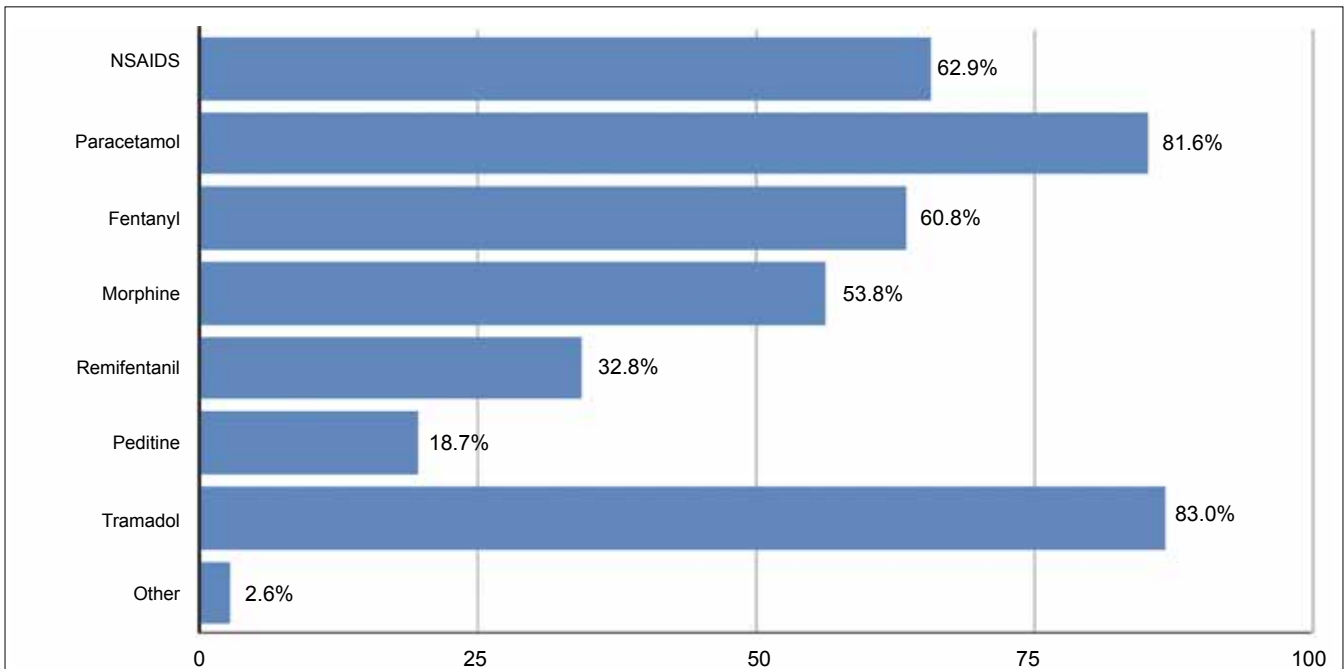


Figure 3. Analgesic drug choices (more than one drug could be chosen)
NSAIDs: nonsteroidal anti-inflammatory drugs

For the question on analgesic choices, tramadol was the most checked drug, and 83% of the respondents indicated its use, followed by paracetamol (81.6%). Figure 3 illustrates the analgesic drug preferences of the respondents.

Table 4 shows the practices and preferences of neuromuscular blocker (NMB) use.

Of the respondents, 50.5% indicated that they routinely evaluated delirium in the ICUs. Table 5 shows the practices regarding delirium evaluation.

According to the respondents, mobilisation was a common practice, and 88.7% of the answers indicated an affirmative answer to the question if they mobilised their patients.

Table 3. Sedation routines and practices	
Question	n (%)
Routine assessment of sedation level (407 responses)	
Yes	298 (73.2)
No	109 (26.8)
Sedation assessment intervals (324 responses)	
Hourly	89 (27.5)
Every 3 h	63 (19.4)
Every 6 h	81 (25.0)
Every 12 h	41 (12.7)
Daily	50 (15.4)
Sedation assessment tools (308 responses)	
Ramsay Sedation Scale	177 (57.5)
Richmond Agitation and Sedation Scale	91 (29.5)
Riker Sedation Analgesia Scale	5 (1.6)
Adaptation to The Intensive Care Environment Scale	5 (1.6)
Inova Sedation Scale	3 (1.0)
Pasero Opioid-induced Sedation Scale	1 (0.3)
Other	26 (8.4)
Daily determined sedation target (409 responses)	
Yes	261 (63.8)
No	148 (36.2)
Monitorization of sedation level (408 responses)	
Yes	52 (12.7)
No	356 (87.3)
Tools for monitorization of sedation level (52 responses)	
Bispectral index	35 (67.3)
Electroencephalogram	6 (11.5)
Other	19 (36.5)
Daily sedation interruptions (406 responses)	
Yes	290 (71.4)
No	116 (28.6)
Presence of written sedation protocols (407 responses)	
Yes	152 (37.3)
No	255 (62.7)
Execution of sedation protocol (380 responses)	
Physician	310 (81.6)
Nurse	70 (18.4)
Screening the sedation level (389 responses)	
Physician	245 (63.0)
Nurse	144 (37.0)

Table 4. Use of neuromuscular blockers	
Question	n (%)
Routine use of NMBs (425 responses)	
Yes	328 (77.2)
No	97 (22.8)
Neuromuscular blocker agents (347 responses)	
Rocuronium	296 (85.3)
Cisatracurium	25 (7.2)
Atracurium	10 (2.9)
Mivacurium	5 (1.4)
Other	11 (3.2)
Neuromuscular blocker application (346 responses)	
Intermittent	278 (80.3)
Continuous	68 (19.7)
Indications for NMB use (359 responses)	
Endotracheal tube exchange	262 (73.0)
Severe hypoxemia	228 (63.5)
Patient-ventilator asynchrony	220 (61.3)
Recruitment maneuver	171 (47.6)
Prone position	131 (36.5)
Agitated patient	18 (5.0)
Other	21 (5.8)
NMB: neuromuscular blocker	

Table 5. Practices regarding delirium	
Question	n (%)
Routine evaluation of delirium (422 responses)	
Yes	213 (50.5)
No	209 (49.5)
Tools for delirium assessment (212 responses)	
The confusion assessment method for ICU	120 (56.6)
Intensive care delirium screening checklist	26 (12.3)
Other	66 (31.1)
ICU: intensive care unit	

When asked if they knew the 2013 American College of Critical Care Medicine (ACCM) guideline for the management of pain, agitation and delirium, only 38% indicated an affirmative answer.

Discussion

To the best of our knowledge, this is the first national survey on sedation practices of ICU physicians in Turkey. There had been several significant findings in this survey. The most im-

portant finding is the low presence of written sedation protocol and the popularity of midazolam as sedative agent.

Intensive care physicians indicated the use of mechanical ventilation as the primary indication for sedation, and in one-third of the answers, sedation during non-invasive ventilation was chosen by the respondents. Although it is believed that non-invasive ventilation negates the use of sedatives, several studies showed that light levels of sedation might be used to facilitate it (8).

The survey showed that midazolam was the most commonly chosen agent, and this was followed by propofol and dexmedetomidine. Several surveys performed in different countries showed the same preference towards midazolam, especially if it is performed for >24 h (9-16). Most of these surveys were conducted before the release of the ACCM pain, agitation and delirium (PAD) guideline, which suggests the use of non-benzodiazepine sedatives (5). Indeed, survey studies from the United Kingdom performed from 2006 to 2015 showed an increase in the preference of propofol over midazolam (10, 17, 18). However, recent surveys conducted by Chawla et al. (15) and Kotfis et al. (16) from Poland and India, respectively, show that midazolam is still the most chosen sedative agent.

In this survey, several opioids and antipsychotics were included in the choices for sedation as these can be co-administered with hypnotics or alone to produce sedation. Fentanyl was the most preferred opioid as an adjunct to sedation. This same preference was observed by Salluh et al. in Brazilian ICUs (12).

Routine assessment of sedation levels was performed by most of the participants (73.2%), and the intervals of evaluation varied widely. In the cases, which sedation levels were evaluated, the Ramsay Sedation Scale was the most preferred tool. This choice had been seen in other countries (9, 11, 17). Several surveys from Nordic countries showed an increased use of more valid assessment tools, such as Richmond Agitation and Sedation Scale (19), as suggested by the ACCM guideline (5).

Only 12.7% of the respondents indicated their use of objective tools to monitor sedation, and bispectral index (BIS) use was indicated by 67.3% of those who gave a positive answer.

The use of objective measures in sedated patients is not recommended for sedated patients in general, but in cases, which receive NMBs, these tools are suggested. However, the use of BIS is not used widely, even if the patients were on NMBs. One UK survey showed BIS use as 2% (17).

More than half of the ICU physicians (63.8%) indicated that they determined a sedation level for their patients every day.

This practice is also suggested in the guidelines. Almost the same amount of respondents (71.4%) indicated daily sedation interruptions. This practice is being more widely used after the study by Kress et al. (20). Guldbrand et al. found that 15% of the Nordic ICUs used daily interruptions of sedative infusions in 2004 (21), and in 2006-2007, this rate was found to be 76% in the United States (14).

The presence of written sedation protocols was found between 20% and 80% in different countries (9-14, 16, 17, 19). This rate was 37.3% in Turkey. Although this rate is low, most of the physicians evaluate sedation levels daily and use daily sedation interruptions. This may show the fact that some unwritten protocols exist.

When written protocols existed, the respondents of the survey indicated that the physicians executed these, and most of the physicians screened the patients' sedation levels. This practice is not investigated in most studies, but a survey, which included intensive care nurses from Nordic and other European countries, reported that decisions regarding sedation were made in collaboration with physicians and nurses (19). The SLRF trial group found that sedation levels were primarily assessed by the nurses (11). Some studies suggested nurse-driven sedation applications, where assessment and titration of sedative doses to a certain sedation level may decrease the occurrence of ventilator-associated pneumonia and shorten mechanical ventilation (22).

Tramadol, which is a weak opioid drug, was the most commonly used analgesic agent in this survey (83%). Tramadol was closely followed by paracetamol (81%) and nonsteroidal anti-inflammatory drugs (63%). The use of opioids was relatively an uncommon choice, and fentanyl and morphine followed non-opioids. This finding is interesting because the guidelines suggest the use of opioid analgesia in ICU patients (5). The respondents were most commonly anaesthesiology and reanimation specialists working in the ICUs; this fact may influence the choices by bringing operating room habits to the ICU or by the fear of the side effects of opioids. When surveys from other countries are studied, opioids are seen as the first choice for analgesia (9-16). Routine evaluation of pain was indicated by more than half of the physicians, and the most commonly used tools for assessment were VAS and NRS. This finding may also be due to the background of the respondents. This practice was observed in Nordic ICUs, where nurses indicated the preference of VAS and NRS in 88% of the answers (19). For non-communicating patients, the use of pain scales was low, and BPS was stated only in one-fifth of the responses.

NMB use was found to be rather high (77.2%) than surveys from other countries. In the survey conducted to the ICU nurs-

es from Nordic countries, only 3% indicated NMB use (19). In a Canadian survey, the most commonly used NMBs were pancuronium, rocuronium and vecuronium (13). Pancuronium was not a choice in this survey, as it is not available in the country, but the most common NMB was rocuronium. As found in the Canadian survey, the most common indications for NMB use were endotracheal intubation and severe hypoxemia. Nearly 20% of the participants indicated the use of NMBs by infusion. Infusion of NMBs is a controversial practice, but it may be indicated in patients with severe hypoxemia (23).

Routine assessment for delirium was indicated by half of the respondents, and the most common tool for assessment was Confusion Assessment Method for the Intensive Care Unit. These figures are consistent with other surveys (10, 18, 19). However, there is an apparent need for improvement in this area as suggested by the ACCM PAD guideline that delirium has to be monitored in adult ICU patients (5).

The present study has several limitations. First, the response rate was only 25%, and a non-responder bias cannot be eliminated. As with all surveys, this type of bias cannot be eliminated, and limited response rate is seen in similar studies (11, 15, 16). This survey aimed to investigate the practices and preferences of physicians. The results do not represent the practices in the ICUs as more than one physician for the same ICU may have answered the question. Similar to all surveys, the answers to the questions may not reflect the actual practice. For further evaluation of the practices of sedation, analgesia and delirium, patient-based studies have to be done.

Conclusion

The results of this survey have indicated some areas to be improved, such as low incidence of written sedation protocols, frequent use of benzodiazepines and delirium screening. A national guideline should be prepared taking pain, agitation and delirium in focus.



You can reach the questionnaire of this article at <https://doi.org/10.5152/TJAR.2019.49799>

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of İstanbul University-Cerrahpaşa, Cerrahpaşa School of Medicine (approval no. 261075, date: 07.07.2017).

Informed Consent: Written informed consent was not obtained because this study was a survey investigating the practices and preferences of physicians, and didn't involve any patients. Participation in the survey was voluntary and anonymous, completing the survey form was considered as consent.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – S.Ü., E.E., T.U., Y.D.; Design – S.Ü., E.E., T.U., Y.D.; Supervision – S.Ü., E.E., T.U., Y.D.; Data Collection and/or Processing – S.Ü., E.E., T.U., Y.D.; Analysis and/or Interpretation – S.Ü., E.E., T.U., Y.D.; Literature Search – E.E., Y.D.; Writing Manuscript – S.Ü., E.E., T.U., Y.D.; Critical Review – S.Ü., E.E., T.U., Y.D.

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Appendix A. Sedation applications of intensive care physicians

1. Your age?
.....
2. Your gender?
.....
3. How long have you been working in intensive care?
.....
4. What kind of hospital do you work?
 - State university
 - Foundation university
 - Educational research hospital
 - State hospital
 - Private hospital
5. What is the number of beds in your intensive care unit?
.....
6. What is the way you work in intensive care?
 - Open (working with own physicians)
 - Close (working with intensive care)
 - Mixed
7. What is the level of your intensive care unit?
 - Level 1
 - Level 2
 - Level 3
8. Who is the responsible physician for your intensive care unit?
 - Intensive care specialist
 - Anaesthesiologist
 - Internal medicine specialist
 - Pulmonologist
 - General surgeon
 - Cardiologist
 - Other
9. Do you practice sedation in your intensive care unit?
 - Yes
 - No → You can go to question 24
10. What are your indications for sedation? (You can mark more than one)
 - Anxiety
 - Agitation
 - Sleep disorder
 - Simplification of artificial respiration
 - Amnesia
 - Prevention of withdrawal syndrome
 - Prevention of seizures
 - Delirium
 - Other
11. Which ventilation application do you prefer to use sedation? (You can mark more than one)
 - Invasive mechanical ventilation
 - Non-invasive mechanical ventilation
 - Patients with spontaneous respiration
12. Which agents do you prefer in sedation? (You can mark more than one)
 - Dexmedetomidine
 - Propofol
 - Ketamine
 - Sodium thiopental
 - Midazolam
 - Lorazepam
 - Diazepam
 - Fentanyl
 - Morphine
 - Remifentanyl
 - Haloperidol
 - Quetiapine and the like
 - Other
13. Do you routinely evaluate sedation levels?
 - Yes
 - No → You can go to question 16
14. How often do you evaluate sedation?
 - Hourly
 - Every 3 h
 - Every 6 h
 - Every 12 h
 - Every 24 h
15. Which scale (tool) do you use?
 - Richmond Agitation and Sedation Scale (RASS)
 - Ramsey Sedation Scale (RSS)
 - Pasero Opioid-induced Sedation Scale (POSS)
 - Riker Sedation Analgesia Scale (RSAS)
 - Inova Sedation Scale (ISS)
 - Adaptation to The Intensive Care Environment Scale (ATICE)
 - Other
16. Is the daily sedation target determined for each patient?
 - Yes
 - No
17. Do you monitor sedation?
 - Yes
 - No → You can go to question 19
18. Which methods do you use for sedation monitoring? (You can mark more than one)

- o BIS
 - o EEG
 - o Facial EMG
 - o Other
19. Do you practice daily sedation interruptions?
- o Yes
 - o No
20. Do you have a written sedation protocol for your unit?
- o Yes
 - o No
21. Who is applying the sedation protocol?
- o Doctor
 - o Nurse
22. Who screens the sedation score?
- o Doctor
 - o Nurse
23. Do you use analgesia in your intensive care unit?
- o Yes
 - o No → You can go to question 28
24. Do you evaluate analgesia?
- o Yes
 - o No → You can go to question 27
25. Which analgesia assessment scale do you use?
- o Numerical Analgesia Scale (NAS)
 - o Visual Analgesia Scale (VAS)
 - o Behavioural Pain Scale (BPS)
 - o Critical Care Pain Observation Tool (CPOT)
 - o Other
26. Which drugs do you prefer for analgesia? (You can mark more than one)
- o Nonsteroidal anti-inflammatory drugs (NSAIDs)
 - o Paracetamol
 - o Fentanyl
 - o Morphine
 - o Tramadol
 - o Pethidine
 - o Other
27. Do you use neuromuscular blocker in your intensive care unit?
- o Yes
 - o No → You can go to question 33
28. Which neuromuscular blocker agents do you prefer?
- o Rocuronium
 - o Atracurium
 - o Cisatracurium
 - o Mivacurium
 - o Other
29. How do you apply the neuromuscular blocker?
- o Intermittent
 - o Infusion
30. In which conditions do you apply neuromuscular blocker? (You can mark more than one)
- o Severe hypoxemia
 - o Recruitment
 - o Tube exchange
 - o Prone position
 - o Patient-ventilator asynchrony
 - o Agitated patient
 - o Other
31. Do you evaluate delirium in your intensive care unit?
- o Yes
 - o No → You can go to question 35
32. Which scale do you use for delirium?
- o Confusion Assessment Method for Intensive Care Unit (CAM-ICU)
 - o Intensive Care Delirium Screening Checklist (ICDSC)
 - o Other
33. Do you mobilise patients in your intensive care unit?
- o Yes
 - o No
34. Do you know the 2013 American College of Critical Care Medicine pain agitation delirium guideline?
- o Yes
 - o No