ADDIS ABABA UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCES SCHOOL OF MEDICNE, DEPARTMENT OF INTERNAL MEDICINE

KNOWLEDGE, ATTITUDE AND PRACTICE ON SEDATION, ANALGESIA AND DELIRIUM AMONG PHYSICIANS WORKING IN THE ICU AT THREE SPECIALIZED HOSPITALS IN ADDIS ABABA

ANDUALELM FIRDIE, MD (FINAL YEAR INTERNAL MEDICINE RESIDENT)

ADVISOR – ASCHALEW WORKU, MD (INTERNIST, PULMONARY AND CRITICAL CARE PHYSICIAN, ADDIS ABABA UNIVERSITY COLLGE OF MEDICIEN AND HEALTH SCIENCES)

A Thesis Submitted to the Department of Internal Medicine of Addis Ababa University in Partial Fulfillment of the Requirements for the Specialization Degree in Internal Medicine

December, 2021

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Declaration

This is to certify that the thesis entitled "KNOWLEDGE, ATTITUDE AND PRACTICE ON SEDATION, ANALGESIA AND DELIRIUM AMONG PHYSICIANS WORKING IN THE ICU AT THREE SPECIALIZED HOSPITALS IN ADDIS ABABA", a hospital-based cross sectional study was carried out by myself and has not been submitted in part or in full for any other degree or any other university.

The thesis comprises only of my original work for specialty certificate in Internal Medicine. Due acknowledgement has been made in the text to all other materials that were referenced.

This thesis is submitted for the qualification of "Specialty in Internal Medicine" and complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Name: Andualem Firdie Cheru **Signature______________Date ____________**

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Abstract

Background: *Critically ill patients admitted to the Intensive Care Units are prone to develop varying degrees of agitation and painful experiences. Despite the many researches and knowledge and practice assessments done in the developed world, there has not been significant studies which deeply looked in to the knowledge, attitude and practices of physicians in Ethiopia regarding the initiation, maintenance and withdrawal of sedative and analgesic medications andthe prevention, diagnosis and treatment of delirium.*

Objectives: *to assess the knowledge, attitude and practice on sedation, analgesia and delirium among physicians working in the ICU of three hospitals in Addis Ababa.*

Methods and Materials: *a multi-center cross sectional study done in 03 different hospitals in Addis Ababa, physicians who consent and with experiences working in the ICU were included. The data was collected with Google forms and then entered on SPSS and a descriptive analysis undertaken with SPSS software.*

Results: *The overall knowledge of participants on pain, sedation and delirium monitoring and management was 71.8%, while the attitude and practices were 80.06% and 53.17% respectively. Having a training on sedation and delirium monitoring and management was found to be associated with good practice on the screening and management of pain, agitation and delirium.*

Conclusion and Recommendations: *This survey has shown the presence of poor practice regarding the evaluation and management of pain, agitation and delirium despite moderate knowledge and good attitude. Preparing formal on job trainings to physicians practicing in ICUs might help improve the practice.*

Key words: *ICU, Pain, Sedation, Delirium*

List of Abbreviations

BPS - Behavioral Pain Scale

CAM-ICU – Confusion Assessment Method for ICU

DDS – Delirium Detection Scale

DSI – Daily Sedation Interruption

DSM – Diagnostic and Statistics Manual for Mental Disorders

GP – General Practitioner

ICU – Intensive Care Unit

ICD – International Classification of Diseases

ICDSC – Intensive Care Delirium Screening Checklist

NRS – Numerical Rating Scale

NSAIDs – Non-Steroidal Anti-Inflammatory Drugs

PAD – Pain, Agitation and Delirium

RASS – Richmond Agitation Sedation Scale

RSS – Ramsey Sedation Scale

SAS – Riker Agitation Sedation Scale

TASH – Tikur Anbessa Specialized Hospital

U.K – United Kingdom

U.S – United States

VAS – Visual Analog Scale

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1. INTRODUCTION

1.1. Background

Varying degrees of pain, agitation and delirium are among the adversities patients experience in the Intensive Care Unit (ICU) and the effective management of these conditions is associated with improved clinical and long term functional outcome (1,2). The incidence of pain in the ICU is higher than 50% and poorly managed pain is strongly linked to the occurrence of a stress response ranging from mild agitation to delirium and post-traumatic stress disorder. It is a common practice to use sedative medications for patients admitted to the ICU and especially for those who are on mechanical ventilation to relieve pain and discomfort and to control agitation and ventilator asynchrony(3).

Excessive sedation may be harmful and have a number of adverse effects like hypotension, venous thrombosis, prolonged ventilation and an increased risk of pneumonia, prolonged stay in the ICU with accompanying increased burden on staff and health care costs. Maintaining lighter levels of sedation in adult ICU patients is associated with improved clinical outcomes as manifested by shorter duration of mechanical ventilation and a shorter ICU length of stay (4,5). Deep sedation during stay in the Intensive Care Unit (ICU) may have deleterious effects upon the clinical and cognitive outcomes of critically ill patients undergoing mechanical ventilation(6). Delirium has been shown to be an independent risk factor for long-term self-reported problems with cognitive functioning(7).

Delirium is a neuropsychiatric condition marked by a disturbance in the level of consciousness of relatively acute onset, associated with an inability to focus, sustain, and shift attention along with an impairment of recent and immediate memory. The incidence of delirium varies widely depending on the setting (hospital versus old age care centers) and the diagnostic criteria used. Even within the hospital, the incidence varies in general wards, surgical wards, postoperative care, and ICUs, each of which has its unique risk factors and complications(8).

Delirium was associated with an increased risk of in-hospital (delirium v. no delirium: 29% v. 12%; $p<0.01$) and 12-month (30% v. 20%; $p<0.01$) mortality, as well as increased length of hospital stay (7 days v. 5 days; $p<0.01$)(9). Among hospitalized medical and surgical patients in Zambia, delirium prevalence was high and delirium duration independently predicted mortality and disability at 6 months(10).

To date, a number of systematic reviews and subsequent evidence-based clinical practice guidelines have been published for sedation practices but implementation of this protocols have been variable among health professionals(4). A survey conducted in hospitals across North America found a

significant discordance between the perceived importance of delirium in the ICU and the practices of delirium monitoring and treatment among health professionals. Most healthcare professionals (92%) considered delirium in the ICU a common and serious problem but only 16% used a validated instrument to monitor for this condition(11). Several factors have been known to affect the practices of using sedative and analgesic medications and among those are geographic location, availability of drugs and the types of ICU patients being managed(12).

1.2. Statement of the problem and Significance of the Study

Sedative medications have widely been used in critically ill patients to avoid anxiety, reduce the stress which may accompany mechanical ventilation and to prevent agitation related harms (13). Despite strong recommendations to use standard sedation scales, significant proportion physicians make use of those monitoring tools as evidenced from a study done in France which showed that less than 70% of Intensivists report routine use of sedation scales (14).

In another study done in the United Kingdom, 88% of physicians reported routine use of a sedation monitoring scale; with the Ramsey Sedation Score Scale being the most commonly used (66.4%). Daily sedation interruption was also practiced by 78% of the respondents (4).

A study conducted in Germany showed that a written sedation policy was available in 21% of the studied hospitals (5). A survey conducted among Medical Residents and Pulmonary fellows in Philippines showed that only 34.32% of the respondents used a sedation scale (12).

A study conducted in China, showed delirium assessment rates of 66.77% and use of a scoring method of 34.03% (15). In another study conducted in China, only 25.62% of physicians and nurses reported routine screening of ICU delirium (16). Another study conducted in Poland showed that only 46.1% of respondents reported using sedation scales. Sedation protocol implementation was reported in one fifth of the ICUs (19.4%) and daily sedation interruption (DSI) was performed by only 32.1% of units. Only 10.9% of the respondents declare monitoring of the ICU delirium. The most frequently used approach reported to monitor ICU delirium were the ICD 10 criteria (5.45%), Confusion Assessment Method – ICU (CAM-ICU) tool (3.03%) and the Diagnostic and Statistical Manual of Mental Disorders -4 (DSM-IV) criteria (2.42%). Only 10.3% of the respondents declared having an ICU delirium treatment protocol (17).

A study conducted in medical and surgical ICUs at Tikur Anbesa Specialized Hospital (TASH),

Ethiopia showed 38% of responding physicians and nurses reported use of sedation practices in managing critically ill patients (18).

There is no local data looking deeper in to the knowledge, attitude and practices among physicians in Ethiopia regarding Sedation, Analgesia and Delirium assessment and management of critically ill and mechanically ventilated patients admitted in the ICU. Therefore, the purpose of this study is to identify current knowledge, attitude and practices among physicians in the three hospitals in Addis Ababa regarding the evaluation and management of and will try to point our areas of improvement.

2. Literature Review

2.1. Knowledge about Sedation, Analgesia and Delirium

In a study done in China, the majority of respondents (88%) believed that delirium was associated with prolonged mechanical ventilation. And 79.72% thought delirium was associated with prolonged length of hospitalization. Only 14.17% of respondents believed that delirium was common in the ICU setting (16).

A study done in Poland in 2017 showed, that Polish Intensivists regard delirium as a moderately important problem (mean score 5.25 ± 2.59 rating on a 0–10 point scale), and only 11% of Polish intensivists screen for delirium. In the same study only 46.1% of the respondents reported active monitoring of sedation(17).

A Survey done at University of the Philippines-Philippine General Hospital to assess Knowledge, Attitudes and Practices of Sedation and Analgesia Among Medical Residents and Pulmonary Fellows-in- training in 2014 showed that the major indications for use of sedative agents were agitation (55.22%), patient comfort (49.25%) and dysynchrony with the mechanical ventilator (41.79%). Other reasons include pain, procedural, intubated patients, myocardial infarction, seizures and prior to intubation. Monitoring of patient's neurologic status, lack of funds, hemodynamic instability, unavailability of sedative agents and contraindications were the main reasons why sedation was not used in critically ill patients.

A survey of behaviors and attitudes of 1,384 healthcare professionals in ICUs in North America showed that 59% (766/1300) of healthcare professionals responded that at least a quarter of mechanically ventilated patients experience delirium. Among the patents not on mechanical ventilator, 33% (430/1297) of the participants thought that at least a quarter or more of these patients experienced delirium. Most respondents (86%, 1136/1313) agreed with the statement that delirium is an under-diagnosed syndrome in ICU patients(11). Most agreed that delirium in the ICU prolongs hospital stay (95%), affects re-intubation rate (90%), and is a risk factor for hospital-acquired pneumonia (78%)(11).

2.2. Practices of Pain and Sedation Management

International prospective cohort study on Analgesia, Sedation, and Delirium Practices conducted in six different regions (U.S.A/Canada, Europe, Africa, Latin America, Asia and Australia/New Zealand) to

compare change in Analgesia, sedation and Delirium practices between 2010 and 2016, after the 2013 Pain, Analgesia and Delirium (PAD) guidelines were published. It showed that the proportion of patient days with opioid infusions increased from 45 to 62% ($p < 0.001$), and the proportion of patient days with sedative infusions (i.e., sedation days) increased from 47 to 58% ($p < 0.001$)(2).

In 2010, benzodiazepines were the most frequently used sedative in all regions with use being highest in Africa and Latin America (95% of sedation days). From 2010 to 2016, the use of any benzodiazepine decreased from 71 to 55% of sedation days overall ($p < 0.001$) with Africa experiencing the least change in choice of sedative between 2010 and 2016. Overall, the use of propofol increased from 38 to 41% of sedation days from 2010 to 2016 ($p < 0.001$). By 2016, propofol had become the most frequently used sedative in the US/Canada, Europe, and Australia/New Zealand, while Africa, Latin America, and Asia still utilized benzodiazepines most frequently. In addition, propofol was nearly twice as common in Australia and New Zealand in 2010 compared to other regions. Use of dexmedetomidine increased from 0.8 to 11% overall ($p < 0.001$), with Asia using it most frequently in 2016 (29% of sedation days)(2).

A national survey conducted in Turkish ICUs in 2019 showed that 97% of the respondents prescribe analgesic medications as a routine; the most commonly used drug being Tramadol (83%) followed by Paracetamol (81%) and other Non-Steroidal Anti-inflammatory drugs (63%), 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%). The same survey showed that Midazolam is the most commonly used agent for sedation followed by propofol and dexmedetomidine. Routine assessment of sedation level was practiced by 73.2% of the participants and the most commonly used scale was the Ramsay Sedation Scale. 71.4% of the participants reported practice of daily sedation interruption and presence of written sedation protocol was found to be 37.3%(19).

A national Multicenter survey done in China in 2017, showed that 75.5% of the participants reported daily assessment of pain, of which only 45.8% used pain scores. The top three popular pain scores were the visual analog scale (VAS, 358/772, 46.37%), critical care pain observation tool (CPOT, 173/772, 22.41%), and numerical analog scale (115/772, 14.9%). Fentanyl (662/1011, 65.48%), sufentanil (530/1011, 52.42%), and morphine (458/1011, 45.3%) were commonly used for analgesia. 90.21% of clinicians reported assessing sedation needs daily and 68.94% used sedation scales. The Richmond agitation-sedation scale (RASS, 496/883, 56.17%) and Ramsay scale (335/883, 37.94%) were the most

popular scales for sedation. Widely used sedation agents were midazolam (864/1011, 85.46%), propofol (860/1011, 85.06%), and dexmedetomidine (638/1011, 63.11%)(15).

A study among Medical Residents and Pulmonology fellows in Philippines showed that Morphine is the most commonly used analgesic agent (used by 40.3% of participants). 41.79% of the participants never used a sedation scale but a majority of the clinicians reported practice of sedation interruption(12).

A survey done in ICUs in the United Kingdom showed that 88.1% of them utilize a sedation scoring tool. The Ramsey Sedation Scale score being the most widely used (66.5%). Most UK ICUs (80%) have a written sedation guideline and 78% practice daily sedation holding. However, only 53% of ICUs audit compliance with their guidelines. Neuromuscular blocking agents are infrequently used, with 71% of ICUs using it less than 5% of the time. Choice of a sedating agent is mainly guided by duration of action of the agent. In comparison, cost of the sedating drug has less of an influence on sedation choice (mean visual-analogue scale score cost 4.4 versus duration of action 6.4; $P < 0.0001$(4).

A survey done at the Kenyata National Hospital in Kenya to assess the knowledge, attitude and practice of Nurses practicing in the ICU showed that 83.3% of the nurses haven't read the national sedation and analgesia guidelines and among those who have read the guidelines 15 (72.3%) reported that they do not practice according to the guidelines. The average correct response rate for the adverse effects of under sedation or over sedation was 67.5%(20).

A sedation management practice survey conducted among health care workers was done in 2014 at Tikur Anbessa Hospital and it showed that 38 out of 50 participants (76%) do not know of available sedation measuring tools and 66% of them reported that they have never received educational training regarding sedation(18).

2.3. Screening and Management of Delirium

International prospective cohort on sedation, analgesia and delirium practice done in six different regions showed that occurrence of delirium during admission increased from 7% of patients in 2010 to 9% of patients in 2016 ($p = 0.007$), the increments mainly contributed by US/Canada region having delirium rates that doubled between 2010 and 2016 (17% vs. 36%, $p < 0.001$). There were no significant changes in Europe (6% vs. 6%, $p = 0.964$), Asia (6% vs. 7%, $p = 0.152$), Africa (1% vs. 0%, $p = 0.440$), or Australia/New Zealand (13% vs. 8%, $p = 0.098$). The increased in prevalence of delirium in the United States/Canada region may be due to observation bias as awareness and training for identifying delirium increase(2).

A Survey done in China in 2017, to assess perceptions, attitudes, and current practices regards delirium in China among Critical care physicians and nurses showed a high-level knowledge on the definitions, symptoms and classifications of delirium. Among those reporting on complications arising from delirium, 88% of the participants believed that delirium was associated with prolonged mechanical ventilation, 79.72% reported of prolonged length of hospital stay. 77.54% agreed that ICU delirium was associated with higher mortality. 25.62% of the medical staff reported routine screening of delirium in the ICU. 41.77% of the participants assessed ICU delirium on a routine basis. 45.4% of the participants have never received any form of training on ICU delirium.

A sedation and delirium practice assessment among health care professionals in North America showed that 59% of healthcare professionals responded that at least a quarter of mechanically ventilated patients. Most respondents (86%, 1136/1313) agreed with the statement that delirium is an under-diagnosed syndrome in ICU patients. A majority of respondents, 59% (774/1302), reported some type of screening for delirium. Of those that did screen for delirium, 33% (258/774) reported using a specific screening tool. Most respondents (54%, 683/1270) reported screening for delirium at least once daily and 12% reported to screen for delirium 4 times a day. Antipsychotic drugs and sedatives were the two categories of medications most commonly chosen by the healthcare professionals to manage delirium(11).

A National survey done in South Africa to assess knowledge and practices on Delirium showed that eighty per cent of the respondents believe that delirium impacts significantly negatively on patient outcomes whilst 1% indicated that there was no such association. Delirium screening is achieved mainly by clinical assessment (77%). Twenty-four per cent utilize an objective tool to screen for delirium and amongst them the CAM-ICU is utilized by 80%. Amongst delirious patients the sedative of choice is dexmedetomidine in the majority but 20% prescribe midazolam as a first choice in this setting(21).

3. Objectives

3.1. General Objective

- To study the knowledge and practice of physicians regarding Sedation, Analgesia and Delirium monitoring and management

3.2. Specific Objective

- To determine knowledge of physicians on evaluation and management of Pain, Agitation and Delirium in Critical Care.
- To know attitude of physicians regarding the evaluation and management of Pain, Agitation and Delirium in Critical Care.
- To determine current practices of physicians on evaluation and management of Pain, Agitation and Delirium in Critical Care.
- To assess factors affecting Sedation, Delirium and Pain management practices.

4. Methods and Materials

4.1. Study design

- Cross-sectional study which includes all physicians (General Practitioners, Residents, Fellows and/or consultants) who either are currently practicing in the ICU or who have had prior experience working in the ICU will be included.

4.2. Study area

- Tikur Anbessa Specialized Hospital (TASH), St. Peter specialized hospital and Yekatit 12 Hospital.

4.3. Study population

- All physicians working in the ICU or who have had experience working in the ICU were included.

4.4. Inclusion and Exclusion criteria

4.4.1. Inclusion criteria

- All physicians who were practicing or who have practiced in the ICU and who consented to participate in the study were included.

4.4.2. Exclusion criteria

- Physicians who never had the experience of working in the ICU or Physicians who didn’t consent to participate in the study were excluded.

4.5. Sample size determination

The sample was determined using the formula for single population proportion by considering 50% percent proportion of knowledge regarding sedation, analgesia and delirium practice because there is no previous local data.

Since it increases the sample size, 95% level of confidence, 5% margin of error is chosen.

$$n = (Z)^2 X p(1-p)/e^2$$

Where: n = Sample size;

P = Proportion of knowledge, 50%;

e = margin of error (0.05);

Z^2= confidence interval and significance level

$$n = (1.96)^2 X 0.5 (1 - 0.5)/ (0.05)2 = 384$$

The total number of physicians who can potentially be included in the study is 420, which is less than 10000. Therefore a modification of the above sample size calculation will be mandatory and the new sample size will be calculated as

$$nf= ni/(1+ni/N)$$

$$nf = 384(1 + 384/420) = 200$$

With an estimated 10% non-response rate the final sample size will be 220.

4.6. Variables

4.6.1. Outcome variable

- Knowledge, Attitude and Practice on Sedation, Analgesia and Delirium Monitoring and Management

4.6.2. Independent variables

- Socio-demographic factors
- Level of Medical Training (GPs, Resident, Fellow, Consultant)
- Years of practice
- Trainings on critical care
- Place of practice (Teaching Hospital, Public Hospital).

4.7. Operational Definition

Analgesia - absence of the sense of pain without loss of consciousness.

Sedation - reduction of anxiety, stress, irritability, or excitement by administration of a sedative agent.

Delirium – an acute onset of disturbance in attention and cognitive function that develops over a short period of time (hours to days) in a critically ill patient.

Overall **knowledge** was categorized using Bloom's cut off point, as good if the score was between 80 and 100%, moderator if the score was between 60 and 79%, and poor if the scorewas less than 60%(22).

Overall **attitude** was categorized using Bloom's cut off point, as good if the score was between 80 and 100%, moderator if the score was between 60 and 79%, and poor if the score was less than 60%(22).

Overall **practice** was categorized using Bloom's cut off point, as good if the score was between 80 and 100%, moderator if the score was between 60 and 79%, and poor if the score was less than 60%(22).

4.8. Data Collection

Data was collected based on the designed, standardized questionnaire and the questionnaire were filled by the participants and the investigator collected the filled questionnaires. The collected data was checked at the end of data collection day for completeness and consistency.

4.9. Data processing and analysis

The responses were then downloaded from "Google forms" as Microsoft Excel files and that data was finally transferred to SPSS. The data was then cleaned, coded and then a descriptive analysis containing means, percentages and frequencies was done with the SPSS software.

4.10. Data Quality Control Method

Prior to the data collection, the data collection format was cross-checked with available information, then the study questionnaires were organized in to sections. Completeness of the data was assessed and incomplete data was rejected.

4.11. Ethical considerations

Ethical approval was obtained from the Research Ethics Committee of the Department of Internal Medicine and following that, responses were collected from the participants after getting an informed verbal consent.

4.6. Dissemination of results

This project is done as part of completion of the internal medicine residency program, the final manuscript will be submitted to the department of internal medicine and based on the feedbacks from the department attempts will be made to publish the findings on internal medicine journals.

5. Results

5.1. Study Demographics

The survey included 220 physicians. Among the participants 67.7% were male physicians and 49.5% of the total participants were on the second or third year of residency at the Internal Medicine or Anesthesiology Departments.

		Number	Percent (%)
Gender	Male	149	67.7
	Female	71	32.4
	Sub Total	220	100
Number of years in practice	Less than one year	11	5
	One to Five years	147	66.8
	Five to Ten years	61	27.7
	More than 10 years	1	0.5
	Sub Total	220	100
Academic Level	General Practitioner	19	8.6
	Junior Resident (R1)	79	35.9
	Senior Resident (R2 and above)	109	49.5
	Internist	13	5.9
	Sub Total	220	100
Current area of practice	Wards	96	43.6
	ICU	36	16.4
	Emergency Department	15	6.8
	Outpatient	73	33.2
	Sub Total	220	100
Hospital Type	Teaching Hospital	183	83.2
	Public Specialty Hospital	37	16.8
	Sub Total	220	100

Table 1 Demographic characteristics of the physicians in the survey.
R1: first year resident, ICU: Intensive Care Unit

5.2. Knowledge Assessment

Questions asked to assess the knowledge of participants regarding the evaluation and management of Pain, Agitation and Delirium for critically ill patients are summarized on Tables 2, 3 and 4.

5.2.1. Knowledge assessment on Pain

A majority of physicians (70.9%) believe that critically ill patients do routinely experience pain and 84.1% of them believe that pain should be monitored routinely and repetitively.

		Count	Percent (%)	Cumulative percent (%)
Critically ill patients routinely experience resting and procedural pain in the ICU.	Yes	156	70.9	70.9
	No	55	25	95.9
	I don't know	9	4.1	100
Pain should be monitored routinely in the ICU	Yes	185	84.1	84.1
	No	35	15.9	100
Vital signs are reliable indicators of pain in critically ill patients	Yes	74	33.6	33.6
	No	141	64.1	97.7
	I don't know	5	2.3	100
Drug of choice for the management of pain in critically ill patients	Paracetamol	28	12.7	12.7
	Opioids	154	70	82.7
	Other NSAIDs	38	17.3	100

Table 2 (Knowledge assessment on Pain)
NSAIDs: Non-Steroidal Anti Inflammatory Drugs, ICU: Intensive Care Unit

5.2.2 Knowledge assessment on Sedation

56.8% of the physicians are aware of the reliable and validated sedation assessment tools and 77.7% of them have the knowledge that lighter sedation improves a patient's clinical outcome.

		Count	Percent (%)	Cumulative percent (%)
Lighter depth of sedation improves clinical outcome.	Yes	171	77.7	77.7
	No	41	18.6	96.4
	I don't know	8	3.6	100
Occurrence of Delirium has to be evaluated on a routine basis	Yes	193	87.7	87.7
	No	7	3.2	90.9
	I don't know	20	9.1	100
Most reliable and validated sedation monitoring tool is	RASS	104	47.3	47.3
	SAS	21	9.5	56.8
	RSS	13	5.9	62.7
	I don't know	82	37.3	100

Table 3 (Knowledge assessment on Sedation)
RASS: Richmond Agitation Sedation Scale, SAS: Riker Agitation Scale, RSS: Ramsey Sedation Scale

5.2.3 Knowledge Assessment on Delirium

87.7% of the physicians do know that delirium is potentially associated with increased mortality and post ICU cognitive impairment.

		Count	Percent (%)	Cumulative percent (%)
Delirium is associated with increased mortality and post ICU cognitive impairment.	Yes	193	87.7	87.7
	No	7	3.2	90.9
	I don't know	20	9.1	100
Most reliable and validated Delirium assessment tool is	CAM-ICU	93	42.3	42.5
	ICDSC	11	5.0	47.3
	DSM-IV	15	6.8	54.1
	DDS	8	3.6	57.7
	I don't know	93	42.3	100

Table 4 (Knowledge assessment on Delirium)
CAM-ICU: Confusion Assessment Method for ICU, ICDSC: Intensive Care Delirium Screening Checklist, DSM-IV: Diagnostic and Statistics Manual for Mental Disorders IV, DDS: Delirium Detection Scale.

Combining all the above data, the pooled knowledge on the evaluation, monitoring and management of pain, agitation and delirium among the study participants is 71.8% indicating the presence of moderate level of knowledge.

5.3. Attitude Assessment

Questions asked to assess the attitude of participants regarding the evaluation and management of Pain, Agitation and Delirium are summarized in Tables 5, 6 and 7.

5.3.1 Attitude assessment on Pain

90.9% and 90% of the participants believe that pain should be monitored on a regular, routine basis and that non pharmacologic methods should be applied to critically ill patients respectively.

	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
Pain in ICU should be monitored routinely and repetitively	39 (17.7%)	161 (73.2%)	17 (7.7%)	3 (1.4%)	-
Non-pharmacologic aids (e.g.	18	180	17	5 (2.3%)	

Music or relaxation) are useful adjuncts to pharmacological pain management	(8.2%)	(81.8%)	(7.7%)		
Routine, protocol based pain assessment and management should be practiced	40 (18.2%)	173 (78.6%)	7 (3.2%)	-	-

Table 5 (Attitude assessment on pain).

5.3.2 Attitude assessment on Sedation

	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
DSI helps in titrating and achieving lighter sedation	34 (15.5%)	142 (64.5%)	40 (18.2%)	4 (1.8%)	

Table 6 (Attitude assessment on Sedation).

5.3.3 Attitude assessment regarding the evaluation and management of delirium

Routine monitoring for occurrence of Delirium should be practiced	31 (14.1%)	120 (54.5%)	60 (27.3%)	9 (%)	-
	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
Benzodiazepine use is a potential risk factor for development of Delirium	7 (3.2%)	112 (50.9%)	54 (24.5%)	32 (14.5%)	15 (6.8%)
	Always	Often	Sometimes	Rarely	Never
Physical restraints should be applied to all delirious patients	42 (19.1%)	118 (53.6%)	40 (18.2%	9 (4.1%)	11 (5%)

Table 7 (Attitude assessment on Delirium)

The overall attitude of physicians who participated in the survey regarding the evaluation, monitoring and management of pain, agitation and delirium is 80.06; suggesting the presence of a Good attitude.

5.4. Practice Assessment

Questions asked to assess current practice regarding the evaluation and management of pain, agitation and delirium are summarized in Table 8, 9 and 10.

5.4.1. Practice assessment on the monitoring and management of pain

40% of the survey participants routinely monitor for pain and among them the most commonly used pain scale is the Visual Analog Scale.

Tramadol is the most commonly used medication to manage pain in critically ill patients.

		Count (N)	Percent (%)	Cumulative Percent (%)
Do you routinely evaluate for pain?	Yes	88	40	40
	No	132	60	100
If yes, what score/scale do you use?	VAS	36	16.4	40.9
	NRS	23	10.5	67
	BPS	11	12.5	79.5
	No score use	18	8.2	100
How frequently do you monitor for pain?	Six hourly	25	11.4	11.4
	Twice daily	20	9.1	20.5
	Daily	47	21.4	41.8
	As needed	128	58.2	100
Commonly used medication to manage pain in your ICU	Paracetamol	43	19.5	19.5
	Tramadol	141	64.1	83.6
	Other opioids	36	16.4	100

Table 8 (Practice assessment on Pain)
VAS: Visual Analog Scale, NRS: Numerical Rating Scale, BPS: Behavioral Pain Scale, ICU: Intensive Care Unit

5.4.2 Practice assessment on the evaluation and management of sedation

Active sedation monitoring was reported by 62.3% of the participants and the most commonly used sedation monitoring tool is the Richmond Agitation Sedation Scale (RASS).

85% of the participants reported that their ICU doesn't have written protocol/ guideline for monitoring sedation and delirium. Intermittent sedation holding was practiced by 52.7% of the practicing physicians.

		Count	Percent (%)	Cumulative percent (%)
Do you actively assess and document depth of sedation	Yes	137	62.3	62.3
	No	83	37.7	100
If you actively assess sedation, which sedation scoring system do you use?	RASS	100	45.5	73
	SAS	9	4.1	79.6
	RSS	3	1.4	81.8

	I don’t use scales	25	11.4	100
Does your ICU have a written protocol for sedation management	Yes	33	15	15
	No	187	85	100
What is the most commonly used agent used for sedation	Benzodiazepines	61	27.7	27.7
	Propofol	55	25	52.7
	Ketamine	104	47.3	100
Do you routinely practice DSI?	Yes	116	52.7	52.7
	No	104	47.3	100
Do you routinely practice SBT?	Yes	174	79.1	79.1
	No	46	20.9	100
Do you titrate or change sedatives during weaning from mechanical ventilation?	Yes	206	93.6	93.6
	No	14	6.4	100

Table 9 (Practice assessment on Sedation).
RASS: Richmond Agitation Sedation Scale, SAS: Riker Agitation Scale, RSS: Ramsey Sedation Scale, DSI: Daily Sedation Interruption, SBT: Spontaneous Breathing Trial.

5.4.3. Practice assessment on the monitoring and management of Delirium

Only 26.8% the study participants practice routine screening of patients for the development of delirium and the most commonly used delirium assessment tool was the CAM-ICU (42.3%).

36.4% of the participants believe that there’s no benefit of non-pharmacologic therapy for delirium (e.g., Music or Eyeglasses).

		Count	Percent	Cumulative percent
Do you practice routine screening for Delirium	Yes	59	26.8	26.8
	No	161	73.2	100
If you routinely screen for delirium, how frequently do you evaluate the patients	Six hourly	3	1.4	5.1
	Twice Daily	9	4.1	20.3
	Daily	18	8.2	50.8
	As needed	29	13.2	100
When you screen for delirium, what diagnostic tool do you commonly use	CAM-ICU	93	42.3	42.3
	ICDSC	11	5	47.3
	DSM-IV	21	9.5	56.8
	ICD-10	1	0.5	57.3
	I don’t use scoring systems	94	42.7	100
What pharmacologic agent do you	Antipsychotics	156	70.9	70.9

commonly use to manage delirium	Benzodiazepines	64	29.1	100
What non-pharmacologic aids do you provide for delirious patients?	Frequent family visits	135	61.4	61.4
	Music	5	2.2	63.6
	No role of non-pharmacologic therapy	80	36.4	100
Do you practice early mobilization of delirious patients?	Yes	39	17.7	17.7
	No	181	82.3	100
Have you received a formal training on pain, agitation and delirium management?	Yes	21	9.5	9.5
	No	199	90.5	100

Table 10. (Practice assessment on Delirium)

CAM-ICU: Confusion Assessment Method for ICU, ICDSC: Intensive Care Delirium Screening Checklist, ICD10: International Classification of Diseases Version 10, DSM IV: Diagnostic and Statistics Manual for Mental Disorders. CAM-ICU: Confusion Assessment Method for ICU, ICDSC: Intensive Care Delirium Screening Checklist, DSM-IV: Diagnostic and Statistics Manual for Mental Disorders IV,

The overall practice regarding the evaluation, monitoring and management of pain, agitation and delirium is 53.17% which indicates the presence of Poor practice.

5.5. Factors associated with knowledge, attitude and practice on the evaluation and management of pain, agitation and delirium

To identify factors associated with knowledge, attitude and practice on the evaluation and management of pain, agitation and delirium, bivariable and multivariable linear regression analyses were conducted. Variables with a p-value of <0.1 in the bivariable analysis were selected as candidate variables to enter in to a multivariable model. Finally, variables with a p-value of < 0.05 in the multivariable linear regression model were considered as statistically significant.

Thus, among the 7 variables analyzed, only taking prior training on sedation and delirium management showed statistically significant association with the presence of a Good Practice at AOR 95% CI of 1.25 (1.1-10.9), p-value of 0.032.

5.5.1 Factors associated with knowledge on the evaluation and management of Pain, Agitation and Delirium.

Variable		Knowledge		
		Good	Moderate	Poor
Gender	Male	20	81	48
	Female	4	41	26
	p-value (95% CI)	Chi-square : 3.051 0.218		
Years of practice	<1 Year	0	5	6
	1-5 Years	14	80	53
	5-10 Years	10	37	14
	>10 Years	0	0	1
	p-value (95% CI)	Chi-square : 9.394 0.153		
Academic Level	GP	1	11	7
	Junior resident	7	39	33
	Senior resident	13	65	31
	Internist	3	7	3
	p-value (95% CI)	Chi-square : 6.543 0.365		
Site of Practice	Wards	11	51	34
	ICU	4	23	9
	ER	0	7	8
	OPD	9	41	23
	p-value (95% CI)	Chi-square : 5.288 0.507		
Hospital Type	Teaching Hospital	20	99	64
	Public Specialty Hospital	4	23	10
	p-value (95% CI)	Chi-square : 0.939 0.625		
Training	Trained	19	1	1
	Not Trained	121	51	27
	p-value (95% CI)	Chi-square : 7.285 0.026		

Table 11 – Factors associated with knowledge

5.5.2. Factors associated with Attitude on the evaluation and management of pain, agitation and delirium

Variable		Attitude		
		Good	Moderate	Poor
Gender	Male	96	40	13
	Female	44	12	15
	p-value (95% CI)	Chi-square : 7.869 0.02		
Years of practice	<1 Year	8	3	0
	1-5 Years	86	35	26
	5-10 Years	45	14	2
	>10 Years	1	0	0
	p-value (95% CI)	Chi-square : 10.903 0.091		
Academic Level	GP	13	3	3
	Junior resident	52	18	9
	Senior resident	63	30	16
	Internist	12	16	0
	p-value (95% CI)	Chi-square : 7.236 0.300		
Site of Practice	Wards	59	23	14
	ICU	29	7	0
	ER	8	4	3
	OPD	44	18	11
	p-value (95% CI)	Chi-square : 8.213 0.223		
Hospital Type	Teaching Hospital	115	45	23
	Public Specialty Hospital	25	7	5
	p-value (95% CI)	Chi-square : 0.548 0.760		
Training	Trained	19	1	1
	Not Trained	121	51	27
	p-value (95% CI)	Chi-square : 7.285 0.026		
Written protocol	Yes	26	5	2
	No	114	47	26
		Chi-square : 3.939 0.140		

Table 12 – Factors associated with attitude

5.5.3. Factors associated with Attitude on the evaluation and management of pain, agitation and delirium

Variable		Practice		
		Good	Moderate	Poor
Gender	Male	42	37	70
	Female	20	17	34
	p-value (95% CI)	Chi-square : 0.024 0.988		
Years of practice	<1 Year	2	3	6
	1-5 Years	40	37	70
	5-10 Years	19	14	28
	>10 Years	1	0	0
	p-value (95% CI)	Chi-square : 3.449 0.751		
Academic Level	GP	2	2	15
	Junior resident	20	19	40
	Senior resident	33	30	46
	Internist	7	3	3
	p-value (95% CI)	Chi-square : 13.898 0.031		
Site of Practice	Wards	25	26	45
	ICU	10	6	20
	ER	3	4	8
	OPD	24	18	31
	p-value (95% CI)	Chi-square : 3.275 0.774		
Hospital Type	Teaching Hospital	52	49	82
	Public Specialty Hospital	10	5	22
	p-value (95% CI)	Chi-square : 3.624 0.163		
Training	Trained	12	4	5
	Not Trained	50	50	99
	p-value (95% CI)	Chi-square : 9.899 0.007		
Written protocol	Yes	15	5	13
	No	47	49	91
		Chi-square : 6.016 0.049		

Table 13 – Factors associated with practice

6. Discussion

The main aim of conducting this survey was to assess the current knowledge, attitude and practice among physicians regarding the diagnosis, monitoring and management of pain, agitation and delirium among critically ill patients admitted to ICUs at Tikur Anbessa, Yekatit 12 and St. Peter specialized hospitals.

The majority of the participants were senior resident physicians practicing in teaching hospitals and most of them (70.9%) reported that critically ill patients do routinely experience both resting and procedure related pain and 84.1% of the participants are aware of the fact that pain should be routinely and repetitively monitored. 71.8% of the participants have practiced for less than five years. Only 40% of the physicians from this survey reported routine, active pain screening which is lower compared to a survey done in china in 2017, which showed that 75% of the participants screen pain on a daily basis (15).

Among the participants who reported to practice routine screening for pain, the most commonly used evaluation tool in this survey is the visual analog scale (VAS) by 40.5% which is relatable to the findings from a survey in Turkish ICUs which reported that the most commonly used pain evaluation tools in decreasing frequencies were VAS (69%), BPS (18.5%), Critical Care Pain Observation Tool (15.9%) and Numerical Rating Scale)(19).

The most commonly prescribed medication for the management of pain in critically ill patients by our physicians was Tramadol (64.1%) which is comparable to a survey conducted in Turkish ICUs which showed that tramadol was the most commonly prescribed analgesic medication (83%)(19).

A majority of the physicians in this survey (77.7%) were aware of the fact that a lighter level of sedation was associated with improved clinical outcome but only 56.8% of them were aware of the most reliable and validated level of sedation monitoring tools which has shown an improvement from a previous survey conducted at Tikur Anbessa which showed that 76% of the 50 participants weren't aware of the available sedation monitoring tools(18). 62.3% of the physicians reported routine assessment of level of sedation which is higher compared to the study in Poland which showed that only 46.1% of the respondents reported active monitoring of sedation. The result from this survey was however lower compared to the reports from studies done in Turkish ICUs (73.2%) and in a national multicenter survey conducted in ICUs in china which showed that 90.21% of the participants routinely monitor sedation needs.

Regarding the use of sedation scales, 50.9% of the participants in this survey reported use of one of the sedation scales which is fairly comparable to a 58.2% utilization rate reported from a study among medical residents and pulmonology fellows in Philippines but lower than that reported from the Turkish study (73.2%) and China (68.94%)(12,15,17,19).

The most commonly used sedation scale in this survey among those who reported routine assessment of level of sedation is the RASS (73%) which is comparable to the report from the Chinese study which showed that the RASS was the most commonly used scale (56.17%)but was different from the results in surveys conducted in the U.K and Turkish ICUs which showed that the Ramsay Sedation Scale being the widely used (4,12,15,19).

Daily sedation interruption (sedation holding) was routinely practiced by 52.7% of physicians in this survey which is somehow lower compared to the reports from Turkish ICUs (71.4%) and the Philippines survey (79.1%). The widely used agent for sedation by our physicians was Ketamine (47.3%) followed by Benzodiazepines (27.7%), which shows an improving trend of moving towards a decreased use of benzodiazepine based sedation. But the results are not in line to reports from the International prospective cohort study which showed propofol being the most frequently used sedative agent. Midazolam was the most commonly used sedative agent used in ICUs in the Turkish and Chinese surveys (2,15,19).

Recognition of delirium as a serious problem with a potential to impact mortality and post ICU discharge cognitive impairment was 87.7% which is comparable to a survey from South Africa which showed that 80% of the respondents believe that delirium negatively impacts patient outcome. The result was also in agreement to the report from the Chinese survey where participants reported that delirium was associated with prolonged mechanical ventilation (88%), prolonged hospital stay (79.72%) and increased mortality (77.54%) (15,21).

Routine monitoring for delirium was practiced by 26.8% of the participants in this survey which is comparable to the Chinese survey (25.62%) but significantly lower compared to the report from a survey conducted among health care professionals in North America where 59% of the 1302 respondents reported active delirium screening (11,15). Among the participants of this survey who use a specific type of delirium assessment tool, the CAM-ICU was the most commonly used and was reported by 42.3%. Early mobilization of delirious patients was practiced by only 17.7% of the study participants. 90.5% of the study participants haven't had any formal training on the evaluation and management of sedation and delirium and this figure

is higher than what was reported previously by a survey conducted at Tikur Anbessa Hospital among health care workers which showed that 66% of the participants have never had any training on sedation and delirium. These numbers are higher than those from the Chinese survey where only 45.4% of the participants were the ones who reported to haven't had a training on ICU delirium.

8. Strength and Limitation of the Study

8.1. Strength of the study

One of the major strength of this survey is that it identified and tried to address three of the most important complications critically ill patients experience during their ICU stay and tried to assess the current knowledge, attitude and practice among practicing physicians in three ICUs in Addis Ababa.

It has also shown that the practice on pain, agitation and management is poor despite a moderate to good knowledge and attitude on the topics of interest.

8.2.Limitations of the study

One of the important limitation of this study is regarding the assessment of practice where by practices were documented merely based on what's reported by the respondents and wasn't an on job evaluation of the current practice.

The other limitation of the study is its failure to include departments of resident physicians on the research questionnaire which could have helped in comparing levels of knowledge, attitude and practice amongst them.

9. Conclusion

This study has shown that physicians practicing in the three ICUs have good knowledge, moderate attitude and poor practice regarding the evaluation and management of pain, agitation and delirium for ICU patients.

10. Recommendation

85% of the participants have reported the absence of written protocols for monitoring sedation and delirium and preparing such protocols might help improve the current gaps in the practice of standardized Pain, Sedation and Delirium monitoring and management.

Over 90% of the participants have never received formal trainings on pain, agitaton and delirium monitoring and management and providing this opportunity can be a useful entry point to improve current knowledge, attitude and practice on pain, agitation and delirium diagnosis and early management.

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Annex

Consent form for Participants

Dear study participant, I would like to thank you for your participation in this study on assessment of Knowledge, Attitude and Practice of Physicians on the Monitoring and Management of Pain, Agitation and Delirium of critically ill Patients admitted in the ICU.

TITLE OF THE STUDY: Assessment of Knowledge, Attitude and Practices of physicians on the monitoring and management of Pain, Agitation and Delirium of ICU admitted patients, a multicenter cross-sectional study.

COMPENSATION: There will be no compensation for participating in the study.

RIGHT TO WITHDRAW: Your participation in the study is voluntary and you are free to decline it without any consequences. You also have the right to change your mind at any point in time.

CONFIDENTIALITY: The information that you provide will be confidential and shall be used solely for academic and research purpose only. There is no risk associated with participating in the study. Should you have any questions regarding the study, you can directly contact the principal investigator on the addresses provided below.

Questionnaire

Section 1. Socio-Demographic data of Physicians Please put a tick (√) in box next to the right response and for a question which has no options, please write the appropriate response in the spaces provided accordingly.		
1.1	Sex	1. Female 2. Male
1.2	Age (in Years)	________
1.3	Number of Years in practice	1. < 1 2. 1 – 5 3. 5 – 10 4. >10 years
1.4	Academic Level	1. General Practitioner 2. Junior resident 3. Senior resident (R2 and above) 4. Internist 5. PCCM Fellow 6. Consultant (PCCM/Anesthesiologist)
1.5	Primary area/site where you usually practice?	1. Wards 2. ICU 3. Emergency Department 4. Outpatient

Section 2. General Information about the Hospital and the ICU Please put a tick (√) in the box next to the right response and for a question with no options, please write the appropriate response in the space provided.		
2.1	Hospital type you are currently working at	1. Teaching Hospital 2. Public Specialty Hospital
2.3	Number of ICU beds in your Hospital	1. < 4 2. 4 – 8 3. 8 – 12

		4. >12
2.4	ICU type	1. Medical 2. Surgical 3. Both Medical and Surgical
2.5	Average number of admissions per month	__________
2.6	Mechanical Ventilator to ICU bed ratio	1. <1 2. 1:1 3. >1
2.8	Predictive scoring systems used in your ICU	1. SOFA 2. APACHE II/III/IV 3. SAPS 4. MPM0 5. None 6. Other, please specify

Section 3. Knowledge assessment on Analgesia, Sedation and Delirium		
3.1	Critically ill patients will routinely experience resting and procedure related pain.	1. Yes 2. No
3.2	Pain should be monitoredroutinely and repetitively for critically ill patients admitted in the ICU.	1. Visual Analog Scale 2. Numerical Analog Scale 3. Behavioral Pain Scale 4. None 5. Other, Please specify
3.3	Vital signs are reliable indicators of presence of pain for non-communicating critically ill patients.	1. Yes 2. No
3.4	The drug/s of choice for the management of pain in critically ill patients is	1. Paracetamol 2. Other NSAIDs 3. Opioids 4. Other, please specify

3.5	Lighter sedation as opposed to deeper level of sedation is associated with improved clinical outcome.	1. Yes 2. No
3.6	Does your ICU have a written protocol for Sedation practices?	1. Yes 2. No
3.7	Most reliable and valid sedation assessment tool is	1. RASS (Richmond Agitation Sedation Scale) 2. SAS (Riker Sedation Agitation Scale) 3. RSS (Ramsay Sedation Scale) 4. Bispectral Index (BSI) 5. Auditory evoked potential (AEP) 6. I do not know
3.8	Delirium is associated with increased mortality and post ICU cognitive impairment.	1. Yes 2. No 3. I don't know
3.9	Most validated and reliable delirium monitoring tool is	1. CAM-ICU (Confusion Assessment Method for ICU 2. ICDSC (Intensive Care Delirium Screening Checklist) 3. DSM-IV (Diagnostic and Statistics Manual of Mental Disorders) 4. DDS (Delirium Detection Scale) 5. I do not know

Section 4. Attitude assessment regarding the evaluation and management of pain, agitation and delirium						
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
4.1	Pain in ICU should be assessed routinely and repetitively					
4.2	Non-pharmacologic aids (e.g. Music, relaxation techniques) are useful adjuncts to pharmacologic therapy of pain in ICU patients					
4.3	Should a routine, protocol based pain assessment and management be practiced?					
4.4	Daily sedation interruption helps in titrating and achieving lighter level of sedation.					
4.5	Critically ill patients should routinely be evaluated for occurrence of delirium using a standardized tool					
4.6	Benzodiazepine use is a potential risk factor for the development of delirium					
		Always	Often	Sometimes	Rarely	Never
4.7	Physical restraints should be applied to delirious patients.					

Section 5. Practice assessment on the evaluation and management of pain, agitation and delirium		
5.1	Do you routinely assess critically ill patients for presence of pain in your daily practice?	1. Yes 2. No
5.2	If yes, what score/ pain scale do you commonly use?	1. Visual Analog Scale 2. Numerical Rating Scale 3. Behavioral Pain Scale 4. I do not use scores/ scales
5.3	How frequently do you monitor for pain?	1. Six hourly 2. Twice daily 3. Daily 4. As needed
5.4	What is the most commonly used medication for the management of pain in your ICU?	1. Paracetamol 2. Tramadol 3. Other opioids 4. Other
5.5	Is sedation actively assessed and documented in your ICU	1. Yes 2. No
5.6	Which sedation score/scale do you commonly use?	1. RASS (Richmond Agitation Sedation Scale) 2. SAS (Riker Agitation Scale) 3. RSS (Ramsey Sedation Scale) 4. I do not use sedation scales
5.7	Does your ICU have a written protocol for sedation practices?	1. Yes 2. No 3. I do not know
5.8	Most commonly used agent for sedation is	1. Benzodiazepines 2. Propofol 3. Ketamine
5.9	Do you routinely practice daily sedation interruption (DSI)	1. Yes 2. No

5.10	What are the factors affecting choice of sedative agent (select all that apply)	1. Pharmacokinetics/Pharmacodynamics 2. Planned duration of Sedation 3. Patient’s clinical condition 4. Cost of medications 5. Availability of medications.
5.11	Is spontaneous breathing trial (SBT) routinely practiced in your ICU?	1. Yes 2. No
5.12	Are sedation agents changed or titrated during weaning from Mechanical Ventilation?	1. Yes 2. No 3. I do not know
5.13	Have you ever received a training on sedation and delirium management?	1. Yes 2. No
5.14	Is Delirium actively screened in your ICU?	1. Yes 2. No
5.15	If yes, how frequently do you assess occurrence of Delirium?	1. Six Hourly 2. Twice daily 3. Daily 4. As needed
5.16	Which Delirium diagnostic tool do you commonly use	1. CAM-ICU 2. ICDSC 3. DDS 4. ICD-10 5. DSM—IV 6. Other, Please specify
5.17	What Non pharmacologic aids do you provide for delirious patients?	1. Music 2. Glasses 3. Frequent family visits 4. No role of Non pharmacologic treatment 5. Other, please specify

5.18	What pharmacologic agent is commonly used to manage Delirium?	1. Antipsychotics (e.g. Haloperidol) 2. Benzodiazepines (e.g. Diazepam) 3. Cholinesterase inhibitors 4. Others, please specify.
5.19	Are delirious patients mobilized in your ICU?	1. Yes 2. No
5.20	Are physical restraints applied/used in your ICU?	1. Yes, only for Delirious patients 2. Yes, only for agitated patients 3. Routinely for all patients 4. No physical restraints are used at all
5.21	Reasons for applying physical restraints (select all that apply)	1. To prevent self extubation/tube dislodgment 2. To keep medical devices safe 3. To protect staff 4. To prevent falls 5. Staff shortage for supervision 6. Other, please specify
5.22	What do you think are the barriers for assessing Delirium? Choose all that apply,	1. Lack of screening tools 2. Time constraints 3. Insufficient knowledge on delirium 4. Workload 5. Other, please specify