Attitudes, knowledge and practices concerning delirium: a survey among intensive care unit professionals

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ABSTRACT

Background

Delirium is a common form of vital organ dysfunction in Intensive Care Unit patients and is associated with poor outcomes. Adherence to guideline recommendations pertaining to delirium is still suboptimal.

Aims

We performed a survey aimed at identifying barriers for implementation that should be addressed in a tailored implementation intervention targeted at improved Intensive Care Unit delirium guideline adherence.

Design

Survey among ICU professionals.

Methods

An online survey was conducted among 360 Intensive Care Unit healthcare professionals (nurses, physicians and delirium consultants) from six Intensive Care Units in the southwest of the Netherlands as part of a multicenter prospective implementation project (response rate 64% of 565 invited; 283 (79%) were nurses).

Results

Although the majority (83%) of respondents considered delirium as a common and major problem in the Intensive Care Unit, we identified several barriers for implementation of a delirium guideline. The most important barriers were: knowledge deficit, low delirium screening rate, lack of trust in reliability of delirium screening tools, belief that delirium is not preventable, low familiarity with delirium guidelines, low satisfaction with physician-described delirium management, poor collaboration between nurses and physicians, reluctance to change delirium care practices, lack of time, disbelief that patients would receive optimal care when adhering to the guideline, and the perception that the delirium guideline is cumbersome or inconvenient in daily practice.

Conclusion

Although Intensive Care Unit professionals consider delirium a serious problem, several important barriers to adhere to guidelines on delirium management are still present today.

Relevance to clinical practice

Identification of implementation barriers for adherence to guidelines pertaining to delirium is feasible with a survey. Results of this study may help to design targeted implementation strategies for ICU delirium management.

BACKGROUND

Delirium is a common form of vital organ dysfunction in critically ill patients (up to 80% in mechanically ventilated patients) [1] and is associated with increased mortality [2], morbidity, and cognitive impairment [3]. Further, delirium is associated with increased healthcare costs [4] and hospital length of stay [1]. Therefore, adequate delirium management, including screening, prevention and treatment can have significant impact on quality of care and use of resources. Delirium management is considered an essential component of routine care in Intensive Care Unit (ICU) patients and is endorsed by national and international guidelines [5,6]. However, systematic screening for delirium is still not a part of daily routine at many ICUs [7-9] and its management varies widely [10,11]. This general lack of screening for delirium seems to persist in spite of the availability of well validated delirium assessments tools such as the Confusion Assessment Method for Intensive Care Unit (CAM-ICU) or Intensive Care Delirium Screening Checklist (ICDSC) [7,12-19] and agitation and sedation scales such as the Richmond Agitation-Sedation Scale (RASS), all of which are guideline-recommended [5].

Previous studies have shown that various barriers may exist for effective adherence to delirium-oriented measures, such as low confidence in screening tools for the ability to identify delirium [20], lack of knowledge of delirium [21,22], low perceived importance of delirium among professionals [7], fear of adverse events, communication and care coordination challenges, workload concerns, and documentation burden [23]. In general, adherence to clinical guidelines depends on the attitude of the health care professional, the guideline, the organizational context, and social and cultural factors [24-26]. The effectiveness of guideline implementation is enhanced if the strategy is appropriate for the innovation, setting and target group, and includes assessment of current practice, and barriers for adherence [27,28]. Therefore, we designed the ICU DElirium in Clinical PracTice Implementation Evaluation (iDECePTIvE) Study, which is a prospective multicenter study in the Netherlands aimed at a multifaceted implementation program to increase adherence to ICU delirium guidelines and to evaluate effects of the program on processes of care and clinical outcomes [29]. As a starting point of this project, the current knowledge, practices, and attitudes pertaining to ICU delirium have been explored with a survey among participating ICU health care professionals.

Aims and objectives of study

The aim of the survey was to identify barriers for implementation that should be addressed in an implementation intervention targeted at improved guideline adherence.

METHODS

Development and content of survey

The survey was developed according to the framework for perceived barriers for guideline adherence by Cabana et al. [24] and Grol et al. [28]. The framework provides a practical step-wise flow-chart guided approach to assess the reasons or circumstances (barriers) that may exist explaining why physicians do not adhere to guideline recommendations. Based on these publications, we identified two main headings: professional behavior (knowledge, attitude and perceptions) and guideline adherence. Most questions were constructed based on previously published surveys regarding delirium at the ICU [12-16,22,30-32] and the survey consisted of four domains: 1) demographics and other respondents' characteristics, 2) delirium knowledge; 3) attitudes, perceptions and current practices regarding delirium; and 4) guideline adherence.

Delirium knowledge was assessed by means of 18 questions about phenomenology, recognition, risk factors, prognostic implications, clinical importance and management of delirium and method of acquisition of this knowledge was explored. Per respondent a delirium knowledge score was calculated, defined as the percentage correct answers.

Attitudes towards and perceptions regarding delirium were explored through several subdomains: 1) incidence and importance; 2) screening; 3) nurse-physician collaboration; and 4) risk factors. This domain consisted of 21 dichotomous (yes/no) questions or Likert scaled statements that were dichotomized into agreement versus no agreement for analytic purposes. Current practices regarding delirium screening, prevention, treatment as perceived by the health care professionals and documentation practices were assessed by means of 8 questions.

In the part of the survey pertaining to guidelines, we stratified the assessments according to whether respondents were familiar with a Dutch delirium guideline endorsed by the Dutch Society of Intensive Care [6] or not. Respondents not familiar with this guideline were tested with respect to attitudes to guidelines at the ICU in general. This part also consisted of Likert scaled questions or statements and followed similar methodology as previously published [33] and dichotomization similar to the attitudes and perception part.

Validity

The first draft of the survey was revised by three of the authors (MJ, EI and ZT) for the face and content validity. To avoid interpretation problems, we further peer reviewed the survey prior to its dissemination. The survey was presented to the nurse researcher and the local intensivist collaborator at each participating site to test face and content validity. Any comments were incorporated in the new version. Three representatives (a nurse practitioner, nurse scientist and ICU-physician – resident), not involved in the development of the survey, subsequently independently reviewed the second version of the survey and commented on its contents before finalizing the survey. In summary, three authors, twelve local study coordinators and three independent representatives reviewed the survey before finalization.

Assessment of barriers

Barriers were defined depending on the type of question and specific domain: (1) A mean delirium knowledge score below 70% was scored as a barrier regarding knowledge at the group level (e.g. hospital, nurses, physicians), and (2) dichotomous items (yes/no or agree/disagree) were identified as a barrier if < 50% of the respondents gave an answer implicating support for the issue pertaining to that delirium-related statement.

Setting, survey distribution and ethical issues

An electronic survey was conducted among nurses, physicians, and expert delirium consultants (psychiatrists, geriatricians, neurologists) in ICUs of six hospitals in the southwest of the Netherlands [29]. Delirium consultants were only included in the survey when they were consulted on a regular basis as part of routine clinical delirium management, as per the local ICU practice. Their consultation could be requested by an ICU physician 'as needed', but some ICUs entertained regular 'delirium consultants' rounds. Consultants had a role either in determining or confirming a clinical diagnosis of delirium, or provided management advice. Three ICUs with 15 or more ICU beds were defined as high volume ICUs, and three ICUs with less than 15 ICU beds as low volume ICUs. The nurse researcher at each participating site provided the research team with an e-mail list of all healthcare professionals involved in delirium care. All 565 healthcare professionals from six hospitals were invited for the survey. The survey was announced by the local ICU newsletters. The survey was conducted by an online data management open source software program (LimeSurvey), and was available online from 5 September to 12 October 2012. Reminders were sent every week to non-responders. In total, 360 online surveys were completed (response rate 64%). Institutional approval as part of the implementation project [29] was obtained from the Medical Ethical Committee of our institution and the need for informed consent was waived according to Dutch legislation. Under Dutch law, no ethical approval is needed for research among professionals

(survey). The study protocol was reviewed and approved by a committee of the Medical Ethical Committee, in compliance with the Dutch ethical research regulations. Participation in the survey was voluntary and anonymous.

Data analysis

Descriptive statistics included frequencies and percentages of demographics and perceived barriers of participants according to the previous definitions. Knowledge scores were expressed as mean percentages as previously defined. Differences (e.g. knowledge scores) between groups were compared using Chi-square tests and ANOVA or Kruskal-Wallis test. Multivariable logistic regression analysis was used to assess the relationship (Odds Ratio) of several variables (profession, volume of ICU, working experience and working assignment) and responses that indicated barriers for implementation. A p value < 0.05 was considered statistically significant. Data analyses were performed with statistical software package IBM SPSS 21.0.

RESULTS

In total, 360 online surveys were completed (response rate 64%). The majority of respondents were nurses (n=283; 79%). Demographics are shown in **Table 1.** No significant differences were found between the participating ICUs regarding age, years of work experience and working assignment of the respondents.

Delirium knowledge

Mean delirium knowledge score of all respondents was 64% (SD=13)**.** The mean score of nurses was 61% (SD=12), of physicians 72% (SD=13) and of delirium experts 75% (SD=9)**.** There was a significant difference in the mean knowledge scores when comparing nurses, physicians and delirium experts (p<0.001). Further, significant differences existed between nurses and physicians and nurses and delirium experts (p<0.001 for both comparisons). The majority of the respondents (83%, n=298) indicated to have read something about ICU delirium in the past year, but only 37% (n=133) of all respondents had received bedside teaching about delirium. In the past three years 39% of respondents (n=140) had participated in ICU delirium related training or a teaching course. Almost half (47%) of respondents estimated that ICU delirium was associated with long-term neuropsychological deficits (n=168).

Attitudes and perceptions about delirium

Attitudes and perceptions towards delirium are presented in **Table 2(a)** (only barriers are shown). The whole survey, including the items that were not found to be barriers,

Table 1: Demographics of survey respondents

Type of healthcare professional	No.	%
ICU-physicians	53	15
• Intensivists (including fellows)	37	10
• Residents	16	4
ICU Nurses	283	79
Delirium experts (psychiatrists, geriatricians and specialized psychiatric nurses)	24	7
Years of work experience *		
< 1	47	13
1-4	64	18
5-9	72	20
≥10	177	49
Working assignment **		
<35%	7	2
35-55%	28	8
55-75%	46	13
75-90%	93	26
90-100%	186	52
Age (years) ***		
<25	16	4
25-34	109	30
35-44	87	24
45-54	99	28
>55	42	12

ANOVA, analysis of variance; ICUs, intensive care units.
Differences between 6 participating ICUs: * p=0.67, ** p=0.79, *** p=0.15 with ANOVA

is available in English as **Appendix**). The majority of respondents (83%, n=299) found that delirium is common and 84% agreed that delirium is a major problem. Only 71 (20%) of the respondents agreed that delirium was potentially preventable. Almost all (99%) respondents thought that delirium screening is useful and time investment for screening is worthwhile (98%). However, only 34% of respondents believed that nurses were capable to reliably determine delirium using a validated delirium screening instrument. Less than 50% of the physicians and nurses felt that nurses were satisfied with physician-initiated delirium management. They indicated that a better collaboration could be achieved through routine delirium discussions during clinical rounds (74% agreed) and better screening (65% agreed).

Of the sixteen optional risk factors for development of delirium, the top six mentioned risk factors as indicated by the respondents were: sepsis (93%); age >70 (86%); hypox-

emia (85%); shock (83%); acute respiratory distress syndrome (81%) and sedatives or analgesics (81%).

Current practice regarding delirium

The majority of the respondents (96%, 321/336) reported using preventive measures. The following measures were frequently performed: promotion of daytime wakefulness (81%); use of glasses when patients are visually impaired (74%); use of hearing aids when patients are hearing impaired (67%). Less frequently performed preventive measures (noted as potential barriers) included (**Table 2(b)**): allowing family visits as much as possible (50%); placing the patient bed by the window when possible (13%); the use of earplugs for the night (8%); use of eye pads for the night (<1%). Reporting of delirium management components into medical and nurses records was in general infrequent (not shown in Table 2).

All physicians (n=53) mentioned haloperidol as the first drug of choice (**Table 2(b)**). The majority of physicians (97%) reported side effects of haloperidol such as muscle rigidity, ECG abnormalities and decreased consciousness.

Fifty-eight percent of the respondents used the CAM-ICU (n=210), whereas only 51% of these respondents stated that they felt able to perform the CAM-ICU adequately (data not shown); 34% (n=72/210) found CAM-ICU easy to interpret; 30% (n=63/210) used CAM-ICU (and Richmond Agitation Sedation Scale (RASS)) during the daily rounds; 40% found CAM-ICU (and RASS) useful for daily patient management; and only 47% felt they knew what to do next when the CAM-ICU was positive. Patient screening according to CAM-ICU is only possible when RASS (sedation scale) score is higher than -4. This means that the patient is not in coma and that the level of sedation allows non-verbal communication.

Guideline adherence

Twenty-one percent of all the respondents (n=77/360) were familiar with the Dutch ICU Delirium guideline. Of the physicians, nurses and delirium experts 56%, 16% and 29% respectively was familiar with the guideline (p=0.086). **Table 2(c)** shows the results regarding the opinions of the respondents who indicated they were familiar with the Dutch ICU delirium guideline. The high agreement with the following statements indicated barriers to delirium guideline adherence: 1) low expectation that use of guidelines resulted in optimal care; 2) no wish to change delirium oriented practices regardless of the guideline recommendation's; 3) lack of time to execute the guideline in clinical practice; and 4) the perception that the guideline was cumbersome. In contrast, most of the respondents agreed that the guideline content was clinically relevant and scientifically sound. **Table 2(d)** shows the identified barriers among the respondents who rated guideline adherence in general (n=261).

Table 2: Barriers for Guideline Adherence Derived from Survey on Attitudes & Perceptions, Current practices and Guideline adherence

(a) Attitudes and perceptions	%*
Delirium occurrence and importance	
Delirium is preventable	21
Screening	%*
Is a nurse capable to identify delirium with a validated delirium screening instrument?	34
Collaboration	%*
When I as nurse suspect a patient to be delirious, I am satisfied with delirium treatment	47
When I as physician suspect a patient to be delirious, the nurse is satisfied with delirium treatment	42
Collaboration between doctors and nurses with regard to delirium at the ICU can be improved by better screening.	65
Collaboration between doctors and nurses with regard to delirium at the ICU can be improved by routinely addressing delirium in daily rounds.	74
(b) Current practices	
Delirium Screening	%*
In the ICU unit where I work the following delirium screening scale is in use:	
CAM-ICU (n=210; in only two hospitals)	58
ICDSC (n=3)	<1
Delirium Prevention	
Earplugs for the night	8
Family visits as much as possible	50
(c) Dutch ICU delirium guideline adherence (n=76)	Mean (SD)‡
If I follow the guideline recommendations, it is likely that my patients would not receive optimal care	3.1 (1.0)
I do not wish to change my delirium care practices, regardless of what delirium guideline recommends	3.7 (1.0)
I don't have time to use this Guideline	3.5 (0.9)
This guideline is cumbersome and inconvenient	3.0 (1.1)
(d) Guideline adherence in general (n=261)	Mean (SD)‡
Generally, guidelines are cumbersome and inconvenient	3.0 (0.9)
Guidelines are difficult to apply and adopt to my specific practice	3.1 (0.9)
Guidelines interfere with my professional autonomy	3.3 (0.9)
Generally, I would prefer to continue my routines and habits rather than to change based on practice guidelines	3.3 (1.0)
I am not really expected to use guidelines in my practice setting	3.7 (0.9)

** Percentage of agreement = %YES answers or % of the sum of agree and strongly agree answers (from the 5-point Likert scale statements))*

‡ Mean and standard deviation based on the 6 point Likert-scale. Mean score of ≥3 was considered to indicate agreement with statement.

The open-ended question regarding guideline adherence showed: 1) lack of a workable protocol for the delirium guideline; 2) the feeling that previous implementation was

not done properly; and 3) the feeling that there is a low rate of uniformity in delirium management by physicians.

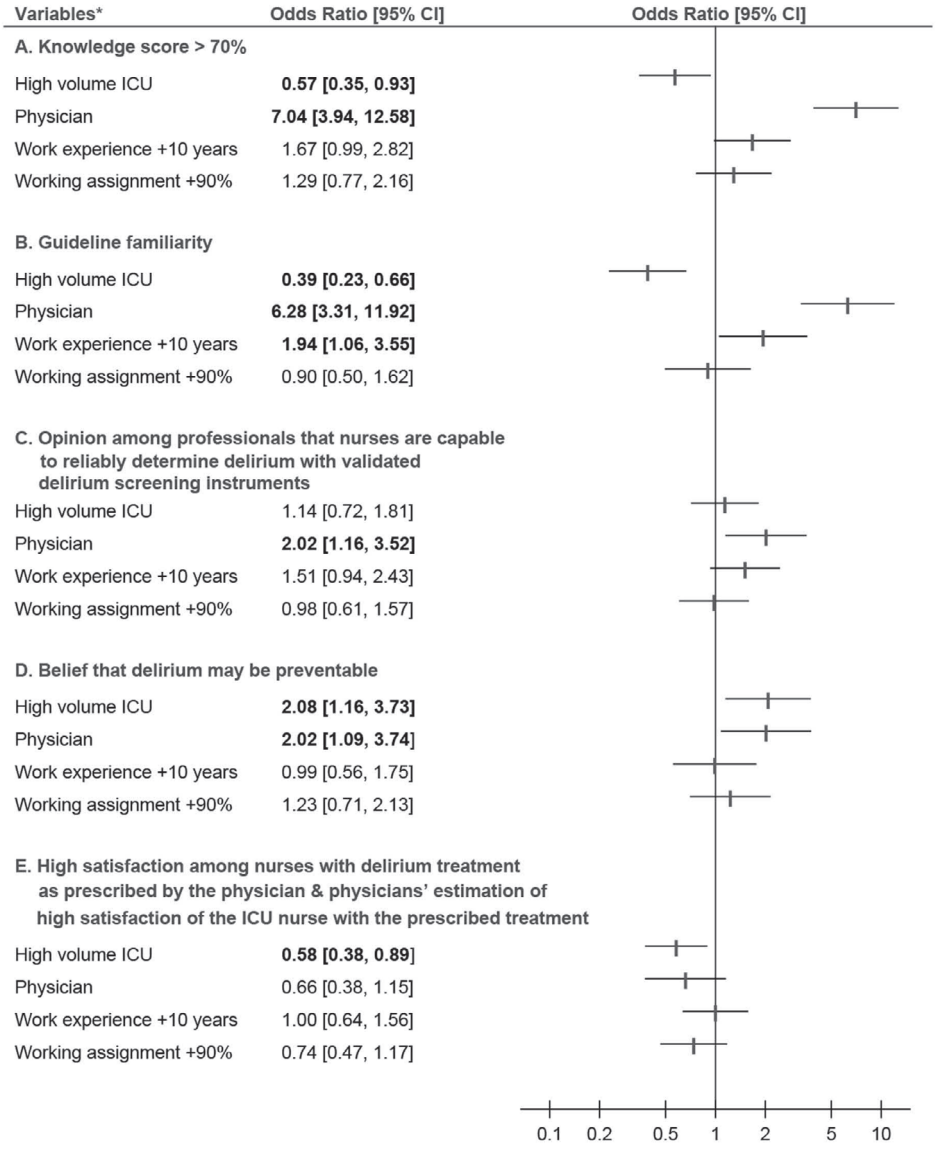

Figure 1: Determinants of perceived barriers resulting from survey results

* Outcome variables (A-E in bold) and covariables included in logistic regression analysis. Interpretation example: physicians were more likely than nurses to have a knowledge score > 70%, with an odds ratio (OR) of 7.04, after adjustment for the other covariables: high volume ICU, work experience and working assignment.

Perceived Barriers for Guideline adherence

Figure 1 illustrates the determinants of perceived barriers resulting from the multivariable analyses. Being an ICU physician (odds ratio (OR) =7.04) as compared with being a nurse and not working on a high-volume ICU (OR for high volume ICU=0.57) were associated with better (>70% correct answers) delirium knowledge. Similarly, being an ICU physician, more than ten years experience and working at a low volume ICU were associated with familiarity with the Dutch delirium guideline. ICU physicians had more trust than nurses in nurses' capability to determine the presence of delirium. Working on a high-volume ICU, and being an ICU physician were associated with the notion that delirium was preventable. Finally, not working on a high-volume ICU was associated with high satisfaction among nurses with delirium treatment by the physician and physicians' estimation of high satisfaction of the ICU nurse with the prescribed treatment.

DISCUSSION

The most important findings of this multicenter survey on delirium among ICU professionals can be summarized as follows: (1) knowledge deficits were present more clearly in nurses than in physicians; (2) although delirium is considered an important problem and is considered worthwhile to be addressed, professionals do not think delirium can be reliably determined with a screening tool or is amenable to prevention; (3) collaboration between nurses and physicians pertaining to delirium management can be improved with nurse-physicians discussions during daily rounds to enhance satisfaction on physician prescribed delirium management; (4) in spite of screening use in clinical practice, health care providers felt uncomfortable with the CAM-ICU for delirium diagnosis and management; (5) preventive measures for delirium were common; (6) there was trust in the content of guidelines and their importance, but lack of trust that patients would benefit when following the guideline, lack of motivation and time to implement guidelines; (7) compared with physicians, nurses were less confident with delirium screening tools and were less convinced that delirium can be prevented; and finally (8) the adherence to delirium guidelines seems to be less in higher-volume ICUs or among professionals with less work experience.

This study is the first survey that was performed within a formal multifaceted multicenter prospective implementation project [29] with the goal to identify barriers for delirium guideline adherence. The implications of our findings for the setting in which the investigation was performed follow directly from the resulting barriers identified based on the survey. For instance, implementation should include education (including bed-side training) on the high reliability of validated screening tools when executed by trained nurses; the lack of familiarity with guidelines in high volume centers should

translate into more efforts in education compared with low volume centers, and our findings indicate that educational efforts should target nurses to a greater extent than physicians. However, whether these findings are generalizable is not certain. It is important to note that this survey was carried out just before publication of the Pain-Agitation-Delirium (PAD) guideline [5]; therefore repeating the survey later in the same population of professionals may lead to different results.

Our findings are in line with those of Ely et al. [34] in the perceived sense of urgency of protocolled delirium management, and the fact that delirium is considered a serious problem. Furthermore, routine screening for delirium is still not broadly applied as found by others [35]. Failure to recognize delirium has previously been reported and was caused by infrequent use of routine delirium assessments tools such as the CAM-ICU or ICDSC [13,14,16,35]. On the other hand, the proven high reliability of these tools was marked as an important potential facilitator for their use by other investigators [8,9,22,36,37]. Compared to previous work [15], we found an increased knowledge (21 to 47%) of long-term cognitive dysfunction resulting from delirium, which is in line with recent findings [38]. Obviously, there is still a difference in perceived importance of delirium and motivation to invest in screening and prevention. We found only one study in which delirium was not considered as an important problem to address [7]. In line with our study, a low confidence in determination of delirium with the CAM-ICU has been found previously [20]. Deficits in delirium knowledge was also previously found, but improved after implementation of delirium-oriented measures [20,22,35,39,40]. ICU professionals, especially nurses, have previously indicated that a better understanding (education) of delirium is needed [17,20,40] justifying education as an essential implementation strategy. The creation of evidence-based toolkits to facilitate successful statewide practice changes and evaluation of their effectiveness in delirium management using an inter-professional team including nurses, physicians, and pharmacists was previously described by Dammeyer et al. [41] and may indicate that such expert-teams are important for the implementation of delirium-oriented interventions.

Our study has several strengths. First, we achieved a high response rate compared to other electronic surveys [42]. Second, next to ICU nurses and physicians we have included delirium experts. Third, to avoid interpretation problems, we peer reviewed the survey quite extensively previous to its execution. Fourth, this survey is the first to our knowledge to assess the impact of several demographic factors on important implementation adherence barriers. Finally, our study design was based on a theoretical framework.

We show that a survey-based identification of barriers is feasible. We recently found in a systematic review that use of more rather than less implementation strategies concomitantly and use of integrated management of delirium with sedation and pain protocols, were associated with potential improvements in clinical outcomes [43]. Surveys

such as these may help to identify which of the many potential barriers to target in implementation projects, which will likely result in more effective practice changes.

Limitations

Several potential limitations of our study should be mentioned. First, we have to take the potential of selection bias into account, because of the 64% response rate. On the other hand, this is a relatively high response rate. Second, socially desirable answers could be given, especially in the section of current practices and the execution of preventive measures. Finally, the fact that a pilot study was not conducted may be perceived as a limitation.

General implications and recommendations for practice

There is still a disconnection between perceived clinical importance of delirium in critically ill patients and level of implementation of delirium prevention, screening and management in daily practice. Among the key issues underlying this discrepancy may be the lack of trust in delirium diagnosis with routine delirium screening by a validated tool such as the CAM-ICU, which in turn may be explained by a general lack of knowledge both of the clinical implications of delirium and the high reliability of such screening. Nurse-physician interaction and collaboration are amenable to improvement, e.g. by means of routine delirium discussions during bedside rounds. Identification of implementation barriers for adherence to guidelines pertaining to delirium is feasible with a survey.

CONCLUSIONS

Our survey identified several important barriers for adherence to guidelines on delirium management. We found there is a disconnection between perceived clinical importance of delirium and adherence to delirium management in daily practice. We found the following barriers to stand out: screening tools are scarcely used and there appears to be an inappropriate lack of trust in routine delirium screening tools, a general lack of knowledge of delirium, a lack of effective nurse-physician collaboration with regard to routine bedside delirium discussions and a lack of protocolled treatment. Thus, in recent years little progress has been made regarding routine use of delirium-oriented measures in spite of current guidelines, but our results may help to design targeted implementation strategies for optimized delirium management.

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APPENDIX:

Survey

Demographics

1. I am working at:

(Choose one of the options below)

- Hospital 1
- Hospital 2
- Hospital 3
- Hospital 4

2. I am a:

(Choose one of the options below)

- Intensivist
- Fellow intensivist
- Physician assistant
- ICU nurse
- ICU nurse - student
- Psychiatrist
- Neurologist
- Another:_____

3. Years of work experience (at the ICU)?

(Choose one of the options below)

- <1
- 2-4
- 5-9
- 10-20
- >20

4. I have a working assignment of:

(Choose one of the options below)

- <35 %
- 35-54 %
- 55-75 %
- 75-89 %
- 90-100 %

5. My age is:

(Choose one of the options below)

- <25 years
- 25-34 years
- 35-44 years
- 45-54 years
- >55 years

1.a Delirium Knowledge Test (good answers)

1. Which form of delirium is according to you the most usual at the ICU?

(Choose one of the options below)

- Hyperactive delirium
- Hypoactive delirium
- Alternating hyperactive / hypoactive
- All forms are almost equally present

2. Features of delirium are (good only if both options are selected)**:**

(Choose what best suits. Multiple answers are possible!)

- Gradually occurrence
- Attention deficit
- Fluctuating consciousness
- Organized thinking

3. A delirium leads to:

(Please choose one of the following options)

- Increased health care costs
- Increased morbidity and mortality in the ICU
- Prolonged mechanical ventilation
- All of the above answers are correct

4. What is true?

(Please choose one of the following options)

- Only the psychiatrist / counselor psychiatry can identify delirium
- 1 time per day screening for delirium is enough
- Delirium identification by a nurse is feasible
- Delirium identification is impossible in psychiatric patients

5. What patient is delirious?

(Please choose one of the following options)

- Patient may have trouble keeping attention and cannot organize his thoughts
- Patient has some trouble with memory, but is not confused
- Patient is cooperative and calm, but hyper-alert
- Patient is plucking and picking, but can focus his attention

6-13 Specify whether you agree with the following statements (good if one of the underlined options is selected)**:**

(Select the appropriate response for each item)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Delirium is under-diagnosed				x	x
Delirium is a problem that requires adequate treatment				x	x
Delirium is in general preventable				x	x
Delirium is associated with long-term neuropsychological damage				x	x
Delirium prolongs the weaning of the patient from mechanical ventilation				x	x
Delirium assessment is needed in patients who seem alert and oriented				x	x
Delirium is associated with an increased risk of dementia				x	x
Delirium occurs only in the elderly	x	x			

14-18: Score the following statements (good if one of the underlined options is selected)**:**

(Select the appropriate response for each item)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I can identify delirium in an ICU patient				x	x
I can explain delirium to the family of a patient				x	x
Delirium is preventable				x	x
Early mobilization and physical therapy can prevent delirium				x	x
Delirium, like acute renal failure, is a form of organ failure				x	x

1.b Education evaluation

1. I have read something about IC delirium in the past year

(Please choose one of the following options)

- Yes
- No

2. How many times have you read about delirium in the past year? *

(Answer this question only if YES to previous question)

- 1
- 1-3
- > 3

3. In the past three years I have participated in training / course in delirium in the ICU

(Please choose one of the following options)

- Yes
- No

4. Statement: This training / course was useful

(Answer this question only if YES to previous question)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Indicate whether you agree with the statement above:					

5. In the last 12 months I have had bedside education about delirium by a psychiatrist or other expert:

- Yes
- No
- Not applicable

6. How often?

(Answer this question only if the following conditions are met: Answer YES to previous question)

Enter your answer here:_____

7. Statement: This has helped me to better understand delirium

(Answer this question only if the following conditions are met: Answer YES to question: Last year I have got bedside education about delirium by a psychiatrist or other expert)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Indicate whether you agree with the statement above:					

2. Attitudes, perceptions and current practices regarding delirium

1. What percentage of all your shifts do you have to deal with delirious patients at the ICU?

(Please choose one of the following options)

- Never
- <10% of shifts
- 10-30% of shifts
- 30-50% of shifts
- 50-70% of shifts
- 70-90% of shifts

2. I think that:

(Please select the appropriate response)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Delirium is a major problem in the ICU					

3. What is in jour opinion the average percentage of patients who developed delirium during their stay at an ICU?

(Please choose one of the following options)

- <10%
- 10-25%
- 26-50%
- 51-75%
- 76-100%

4. What percentage of the ventilated patients develop delirium according to you?
(Please choose one of the following options)

- <10%
- 10-25%
- 26-50%
- 51-75%
- 76-100%

5. On the ICU where I work the following instrument is used to screen for delirium:
(Select what suits. Multiple answers are possible!)

- CAM-ICU (Confusion Assessment Method ICU)
- ICDSC (Intensive Care Delirium Screening Checklist)
- DDS (Delirium Detection Score)
- DOS (Delirium Observation Scale)
- Nu-DESC (The Nursing Delirium Screening Scale)
- None of all
- Other:_____

6. How often is delirium screening performed in the department where you work?
(Answer this question only if one of delirium instruments is used at your department. Multiple answers are possible.)

- At admission
- At discharge
- Daily 1 x per day
- Daily 2 x per day
- Daily each shift
- If necessary,
- Other:_____

7. The CAM-ICU (Confusion Assessment Method - ICU)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
CAM-ICU is easy to perform					

8.We need to use the CAM-ICU in our ICU!

(Please choose one of the following options)

- Yes
- No

9. How often should the CAM-ICU be done according to you?

(Answer this question only if the following conditions are met: Answer YES to question: We need to use the CAM-ICU in our ICU! Please choose one of the following options)

- Once a day
- Twice a day
- Once a service
- One of the top plus if necessary
- If necessary

Otherwise:_____

10. What do you think is the reason that we should not use the CAM-ICU?

(Answer this question only if the following conditions are met: Answer NO to question: We need to use the CAM-ICU in our ICU!)

Please describe:

11. The screening for delirium at the ICU is useful

(Please choose one of the following options)

- Yes
- No

12. Is the time investment for delirium screening (according to you) worthwhile?

(Please choose one of the following options)

- Yes
- No

13. An ICU nurse can reliable determine delirium with delirium screening instrument when this is present?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Please indicate:					

14. Answer the following questions:

(Answer this question only if the following conditions are met: Answer YES to question: On the IC department where I work the CAM-ICU is used to screen for delirium)

Select the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I find that I am familiar with the CAM-ICU to perform it correctly					
I find that I am familiar with the RASS to perform it correctly					
RASS is easy to perform					
CAM-ICU is easy to perform					
RASS is easy to interpret					
CAM-ICU is easy to interpret					
I easily ask a colleague for help with CAM-ICU					
Positive or negative CAM-ICU score tells me something about delirium in my patient					
CAM-ICU score is feasible to use in discussions about delirium					
RASS and CAM-ICU are discussed with physician at daily rounds					
RASS and CAM-ICU are helpful in determining daily management					
If CAM-ICU is positive I know what to do					

15. Answer the following questions:

Answer this question only if the following conditions are met: Answer YES to question: On the IC department where I work the DOS is used to screen for delirium

Select the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I find that I am familiar with the DOS to perform it correctly					
I find that I am familiar with the RASS to perform it correctly					
RASS is easy to perform					
DOS is easy to perform					
RASS is easy to interpret					
DOS is easy to interpret					
I easily ask a colleague for help with DOS					
DOS score <3 of same and >3 score tells me something about delirium in my patient					
DOS score is feasible to use in discussions about delirium					
DOS and RASS are discussed with physician at daily rounds					
DOS is helpful in determining daily management					
When DOS is <3 of same and >3 I know what to do					

16. In the context of psycho-hygiene at the ICU I am applying preventive measures. (Psycho-hygiene: measures to promote mental health such as day / night rhythm, hearing aids, applying orientation measures, ...)

(Answer this question only if the following conditions are met: My function is : ICU nurse, ICU nurse – student, Intensivist, Fellow intensivist or Physician assistant)

- Yes
- No

17. To promote the psycho-hygiene of my patients I apply the following measures (multiple answers are possible)
(Answer this question only if the following conditions are met: My function is : ICU nurse, ICU nurse – student, Intensivist, Fellow intensivist or Physician assistant)

- Promotion of day / night rhythm
- Earplugs for the night
- Sleep Mask for the night
- Hearing Aid
- Glasses
- Family visits as much as possible
- Placement of patients bed as close as possible to the window
- Other:_____

18.What is your first choice drug for delirium in the ICU?
(Answer this question only if the following conditions are met:
My function is: Intensivist, Fellow intensivist, Physician assistant, Psychiatrist or Neurologist)
Enter your answer here:_____

19. What is the usual dose of this drug in mg / day?
(Answer this question only if the previous question is filled in)
Lowest dosage:_____
Highest dose:_____

20. Do you ever see the side effects of this drug?
(Answer this question only if this question is completed: Which drug is for you the first choice drug as treatment for delirium?)
(Please choose one of the following options)

- Yes
- No

21. What side do you know or have you observed?
(Answer this question only if this question is completed: Which drug is for you the first choice drug as treatment for delirium?) Please describe:

22. In a difficult to treat (therapy refractory) delirium:

Select the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Ceased all psychoactive drugs should be					
I have a feeling of powerlessness					
I have the feeling that nothing helps and that the patient should improve spontaneously over time					
The patient is getting less delirious as his physical condition improves					

23. When I, as a nurse, suspect that the patient is delirious:

(Answer this question only if the following conditions are met: My function is: Intensivist, Fellow intensivist, Physician assistant, Psychiatrist or Neurologist)

Select the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel myself "herad" by the physician / intensivist					
The physician / intensivist confirms my opinion					
I am satisfied with the applied treatment					

24. When I, as a physician, suspect the patient to be delirious:

(Answer this question only if the following conditions are met: My function is: Intensivist, Fellow intensivist, Physician assistant, Psychiatrist or Neurologist)

Select the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel myself "heard" by the nurse					
The nurse confirms my opinion					
The nurse is satisfied with the applied treatment					

25. Cooperation between doctors and nurses in delirium management at the ICU can be improved with:

(Select everything that complies. Multiple answers possible!)

- Better screening for delirium
- Routine delirium discussions during daily rounds
- Better verbal transfer of delirium related information
- Better written transfer of delirium related information
- Other:_____

26. How important do you think the following risk factors are for the development of delirium at the ICU?

(Select the appropriate response for each item: 1 = not important; 5 = very important)

	1	2	3	4	5
Sepsis					
ARDS					
Surgery before the ICU admission					
Primary neurological disorder (such as SAB)					
The administration of sedatives and analgesics					
Liver failure					
Renal failure					
Heart failure					
Hypoxia					
Anemia					
Shock					
Visual impairment					
Hearing impairment					
Gender					
Age> 70 years					
Cognitive impairment					

27. Can the routine screening of delirium in the ICU be helpful according to you in order to improve the prognosis of critically ill patients (according to the current state of knowledge)?

(Please choose one of the following options)

- Yes
- No

28.I record / describe the following items in the medical / nursing records:

(Please choose one of the following options)

	Never	Sometimes	Regularly	Very regularly	Always
The interventions done to prevent delirium					
Measures to promote orientation					
The findings on screening / identification of delirium					
Consultation moments and outcomes regarding the treatment of delirium					
The result of the therapy					
Progress of delirium over time					

29. Patients with delirium are treated (next to Haldol) with other drugs, namely:

(Multiple answers are possible!)

- Olanzapine (Zyprexa)
- Other atypical antipsychotic
- Clonidine
- Propofol
- Methylphenidate
- Do not know
- Other:_____

4. Guideline adherence

1. I am familiar with the recommendations of the Dutch Socciety of Intensive Care (NVIC) endorsed guideline: "Delirium in ICU"

(Please choose one of the following options)

- Yes
- No

2. Indicate whether you agree or disagree with the following statements regarding the NVIC guideline "Delirium in ICU":

(Answer these questions only if familiar with the NVIC guideline "Delirium in ICU". Please choose one of the following options)

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
I am familiar with the delirium guideline and its recommendations						
The delirium guideline is easily accessible						
If we follow the recommendations of the guideline, delirium should become less frequent						
If I follow the guideline recommendations, it is likely that my patients would not receive optimal care						
I have confidence in the expertise of the developer of the delirium guideline						
The guideline recommendations are relevant for my patients						
I am not really expected to use this guideline in my practice setting						
The delirium guideline is based on strong scientific evidence						
It is not really practical to follow the guideline recommendations						
I do not wish to change my delirium care practices, regardless of what the delirium guideline recommends						
I feel competent in the execution of the delirium guideline recommendations						
There are other guidelines which are conflicting with the delirium guideline						
I don't have time to use this Guideline						
This guideline is cumbersome and inconvenient						
I'm executing the guideline recommendation in my daily practice						

3. Indicate whether you agree or disagree with the statements regarding Intensive Care Unit guidelines in general:

(Answer these questions only if not familiar with the NVIC guideline "Delirium in ICU". Choose one of the options)

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
I am familiar with the practice guidelines in my field						
There are so many guidelines available that it is nearly impossible to keep up						
In my field, I find practice guidelines readily available						
I don't have time to stay informed about available guidelines						
Guidelines are too "cookbook" and prescriptive						
Practice guidelines are practical to use						
Generally, guidelines are cumbersome and inconvenient						
Guidelines are difficult to apply and adopt to my specific practice						
In this organization, practice guidelines are important						
Guidelines improve patient outcomes						
Guidelines interfere with my professional autonomy						
Generally, I would prefer to continue my routines and habits rather than to change based on practice guidelines						
I am not really expected to use guidelines in my practice setting						
Guidelines help to standardize care and assure that patients are treated in a consistent way						
In my practice setting, there are sufficient administrative support and resources to allow the implementation of the practice guidelines						

4. Factors that motivate me to apply the recommendations from the NVIC guideline "Delirium in ICU":

(Answer these questions only if familiar with the NVIC guideline "Delirium in ICU". Please describe.)

5. Factors that do not motivate me to apply the recommendations from the NVIC guideline "Delirium in ICU":

(Answer these questions only if familiar with the NVIC guideline "Delirium in ICU". Please describe.)

6. Factors that motivate me to apply the recommendations from the ICU guidelines in general:
(Answer this question only if not familiar with the NVIC guideline "Delirium in ICU". Please describe.)

7. Factors that do not motivate me to apply the recommendations from the ICU guidelines in general:
(Answer this question only if not familiar with the NVIC guideline "Delirium in ICU". Please describe.)

Finally
I have filled this questionnaire out without haste and at ease.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Please indicate:					