

# Understanding the Barriers in Delirium Care in an Intensive Care Unit: A Survey of Knowledge, Attitudes, and Current Practices among Medical Professionals Working in Intensive Care Units in Teaching Hospitals of Central Province, Sri Lanka

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## ABSTRACT

**Background:** Delirium is a common, underdiagnosed, and undertreated condition that increases morbidity and mortality in ICU patients which has an incidence up to 80%. Barriers that hinder optimum care of delirium include inadequate knowledge, poor attitudes, and low perceived importance of delirium care.

**Aim:** To assess attitudes, knowledge, and current practices related to delirium care among medical professionals working in intensive care units (ICUs) in all teaching hospitals in Central Province, Sri Lanka, as there are no Sri Lankan studies on this regard.

**Method:** A descriptive cross-sectional study was carried out among all medical professionals working in nine ICUs in all ( $n = 5$ ) teaching hospitals in Central Province. Data were collected using a pretested self-administered questionnaire. Responses to questions were compared between postgraduate trainee medical officers (PG-MOs) and non-postgraduate-trainee medical officers (non-PG-MOs).

**Results:** Eighty-eight questionnaires were analyzed. More than 80% of PGs and non-PG-MOs regarded ICU delirium as significant problem that should be screened and prevented. Forty-one percent stated confidence in diagnosing delirium. However, more than 75% of non-PG-MOs failed to recognize features of hypoactive delirium. Only 30–50% subjects in incorporated preventive methods in usual practice and more than 60% non-PG-MOs had poor knowledge and experience on delirium screening. More than 80% of the participants did not routinely screen their patients. More than 90% non-PG-MOs ( $p < 0.05$ ) had no recent educational exposure.

**Conclusion:** A positive attitude toward the importance of management of delirium was observed. However, there is a discrepancy between the perceived importance and the current practice related to screening and prevention. Participants, especially non-PG-MOs, lacked knowledge on delirium screening, diagnosis, and identification of risk factors, probably related to a lack of educational exposure.

**Keywords:** Attitudes on delirium, Current practice, Delirium care, Knowledge on delirium, Sri Lanka delirium management.

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## INTRODUCTION

Delirium is defined by the American Psychiatric Association, as a disturbance of consciousness, attention, cognition, and perception which develops over a short period of time that tends to fluctuate during the course of the day. It is associated with increased mortality, morbidity, persistent neurocognitive impairment, increased cost, and prolonged hospital stay.<sup>1–14</sup>

The incidence of ICU delirium is estimated to range from 20 to 80% among critically ill patients.<sup>1,4</sup> The only Sri Lankan study that was published by Lochanie and Ranawaka revealed an incidence of 66% among postoperative ventilated patients in a surgical ICU at Colombo National Hospital, Sri Lanka.<sup>7</sup>

However, delirium is widely underdiagnosed and undertreated with 65–75% of cases going undetected.<sup>3</sup> Poor attitudes on delirium care, lack of knowledge on diagnosis and screening tools, communication challenges, time restraints, and workload concerns among professionals working in ICUs are among the identified barriers that are attributed to poor detection and management.<sup>2</sup>

Though multiple studies are conducted worldwide to identify these barriers, to our knowledge, this is the first study that was conducted among Sri Lankan medical professionals working in ICUs. Thus, this study was designed to assess the knowledge, attitudes,

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and current practices on delirium diagnosis and management in ICU patients among medical professionals working in intensive care units in teaching hospitals in Central Province, Sri Lanka.

## METHOD

A descriptive cross-sectional study was carried out among all the medical professionals (possessing at least an MBBS degree)

working in nine intensive care units in all the ( $n = 5$ ) teaching hospitals in Central Province, Sri Lanka (Teaching Hospital Peradeniya, Dental Hospital Peradeniya, National Hospital Kandy, Sirimavo Bandaranayake Children's Hospital, and Teaching Hospital Gampola).

Ethical clearance was obtained from the Ethical Review Committee of the Faculty of Medicine, University of Peradeniya (ERC No: 2020-EC-14).

Data were collected using a pretested self-administered questionnaire from July 1, 2020 to September 1, 2020 after obtaining informed consent from the subjects. A thorough literature survey was undertaken to identify the key issues related to ICU delirium (knowledge, attitudes, and current practices related to diagnosis, screening, impact on the patient and the society, prevention, and education) for the development of the questionnaire. The questionnaire consisted of several close-ended questions, and it covered the following areas: demographic data, knowledge on clinical features of hypoactive, hyperactive and mixed-type delirium, risk factors and risk categories, adverse effects, commonly practiced preventive methods, recommended screening tools (Confusion Assessment Method for ICU [CAM-ICU] tool) for delirium, diagnosis of delirium (Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) criteria), attitudes toward management, screening, and current practices on diagnosis and prevention.

Data were analyzed with IBM SPSS version 25. Results were presented as frequencies and percentages. Significance between the responses of PGs and non-PG-MOs was analyzed using Pearson's Chi-squared test and Fisher's exact test when indicated.  $p$  values less than 0.05 were taken as significant.

## RESULTS

A total of 123 questionnaires were distributed. Ninety-four have responded to the study. Six questionnaires were discarded due to >10% incomplete answers. A total of 88 questionnaires were analyzed, and the response rate for the questionnaire was 76%.

The age of the population ranged between 29 and 60 years, with a mean age of 38.7 years, and 45 (51%) subjects were females.

Of the total, 29 (33%) were PGs with experience in anesthesiology, critical care, and emergency medicine [senior registrars  $n = 10$  (11%), registrars  $n = 19$  (22%)]. Non-PG-MOs comprised 67% ( $n = 59$ ) of the population.

Sixty-nine percent of the population had more than 1 year of working experience in an ICU setting, while 31% revealed that they had <1 year experience.

### Attitudes Related to Delirium Care

Overall, the participants had a positive attitude toward delirium care in critically ill patients. It is encouraging that the majority (80%) regarded ICU delirium as a significant problem that should be screened and prevented (Table 1).

### Knowledge on ICU Delirium Diagnosis and Screening

Components of DSM-5 criteria that included cardinal features of delirium (inattention, disordered cognition, acute onset of symptoms with fluctuating course) were recognized as diagnostic criteria by a majority (>65%) of participants, with a significantly high proportion of PGs identifying the criteria. The most striking feature noted is that only two (2.2%) PGs were able to correctly identify all the diagnostic criteria (Table 2).

### Knowledge on Subtypes of Delirium and Clinical Features

Majority (>85%) had recognized features of hyperactive delirium. However, 55–60% of the population, especially a significant proportion of non-PG-MOs (76–82%), failed to recognize features of hypoactive delirium (Table 3).

### Knowledge on Risk Factors

Interestingly, majority of common risk factors were identified by a greater proportion of the population (Table 4).

**Table 1:** Attitude toward ICU delirium management in ICU

Question	Response ( $n = 88$ )		PGs ( $n =$ )		non-PG-MOs ( $n =$ )		$p$ value
	Yes	No	Yes	No	Yes	No	
Recognition of delirium as a common occurrence	65 (74%)	13 (15%)	27	2	38	23	0.002
Incidence estimate of ICU delirium							
• <10%	24 (27%)		3		13		
• >10%	64 (73%)		26		46		
Self-reported confidence in diagnosis of delirium	36 (41%)	52 (59%)	13	16	23	36	0.769
Delirium screening is important	83 (94%)	5 (6%)	28	1	55	4	0.999
ICU delirium is a major problem	70 (80%)	18 (20%)	27	2	43	16	0.046
ICU delirium is preventable	72 (82%)	16 (18%)	27	2	45	14	0.046
It is important to prevent ICU delirium	87 (99%)	1 (1%)	28	1	59	0	–
Recognize delirium as a predictor of increased mortality	52 (59%)	36 (41%)	23	6	29	30	0.01
Recognize delirium as a cause for increased morbidity	72 (82%)	16 (18%)	27	2	51	8	0.486
Recognize delirium as a cause for persistent cognitive impairment	49 (56%)	39 (44%)	23	6	26	33	0.002
Recognize delirium as an unpleasant occurrence to the patient and family	87 (99%)	1 (1%)	29	0	58	1	–
Recognize that delirium increases length of hospital stay and health care cost	86 (98%)	2 (2%)	29	0	57	2	–

$p$  value was calculated using Pearson's Chi-squared test and Fisher's exact test when appropriate.  $p < 0.05$  was considered as significant

**Table 2:** Responses to knowledge-based questions on diagnostic criteria according to DSM-5

Diagnostic criterion	Total responses (n = 88)			PGs (n = 29)		Non-PG-MOs (n = 59)		p value
	Yes	No	Do not know	Yes	No/do not know	Yes	No/do not know	
Onset is acute in nature	59 (67%)	15 (17%)	14 (16%)	26	3	33	26	0.001
Having a fluctuating course of severity of symptoms during a day	61 (69%)	2 (2%)	25 (28%)	25	4	36	23	0.015
Presence of inattention	65 (74%)	3 (3%)	20 (23%)	28	1	37	22	0.001
Disordered cognition	60 (68%)	5 (6%)	23 (26%)	25	4	35	24	0.014
Absence of premorbid neurocognitive disorder	44 (50%)	17 (19%)	27 (31%)	14	15	30	29	0.999
Absence of evidence of other systemic or other underlying cerebral disease or substance that explains the disturbance	55 (62%)	13 (15%)	20 (23%)	21	8	34	25	0.242

p value was calculated using Pearson's Chi-squared test and Fisher's exact test when appropriate. p <0.05 was considered as significant

**Table 3:** Awareness on clinical features and subtypes of delirium

Clinical feature	Total responses (n = 88)			PGs		Non-PGs		p value
	Yes	No	Do not know	Yes	No/do not know	Yes	No/do not know	
Altered conscious level	64 (73%)	10 (11%)	14 (16%)	25	4	39	20	0.073
Inattention	79 (90%)	1 (1%)	8 (9%)	28	1	51	8	0.261
Disorientation	80 (91%)	–	8 (9%)	28	1	52	7	0.262
Agitation	84 (94%)	2 (2%)	3 (3%)	28	1	55	4	0.999
Restlessness	80 (91%)	2 (2%)	6 (7%)	26	3	54	5	0.999
<b>Reduced alertness</b>	<b>41 (46%)</b>	<b>17 (19%)</b>	<b>30 (34%)</b>	28	1	13	46	0.0001
<b>Reduced speech</b>	<b>36 (43%)</b>	<b>17 (19%)</b>	<b>35 (40%)</b>	22	7	14	45	0.0001
<b>Reduced motor activity</b>	<b>35 (40%)</b>	<b>22 (25%)</b>	<b>31 (35%)</b>	24	5	11	48	0.0001
Hallucinations	72 (82%)	8 (9%)	8 (9%)	24	5	48	11	0.0001
Altered sleep/wake cycles	48 (55%)	15 (17%)	25 (28%)	18	11	30	29	0.320

p value was calculated using Pearson's Chi-squared test and Fisher's exact test when appropriate. p <0.05 was considered as significant

**Table 4:** Awareness on risk factors of ICU delirium

Risk factor	Total responses (n = 88) (%)			PGs (n = 29)		Non-PGs (n = 59)		p value
	Yes	No	Do not know	Yes	No/do not know	Yes	No/do not know	
Severe illness	74 (84%)	4 (5%)	10 (11%)	27	2	47	12	0.130
Mechanical ventilation	38 (43%)	18 (20%)	32 (37%)	22	7	28	30	0.020
Increased age	78 (89%)	5 (6%)	5 (6%)	26	3	52	7	0.999
Preexisting cognitive impairment	62 (71%)	7 (8%)	19 (23%)	24	5	38	21	0.087
Metabolic acidosis and electrolyte imbalances	69 (78%)	4 (5%)	15 (17%)	24	5	45	14	0.588
Sedatives—benzodiazepines	73 (83%)	5 (6%)	10 (11%)	27	2	46	13	0.129
Opioids	73 (83%)	4 (5%)	11 (12%)	26	3	47	12	0.367
Preexisting hypertension	25 (28%)	26 (30%)	36 (42%)	13	16	12	37	0.000
Dehydration	67 (76%)	2 (2%)	19 (22%)	22	7	45	14	0.966
Alcohol abuse	78 (89%)	1 (1%)	9 (10%)	27	2	51	8	0.486
Increased noise in ICU	62 (70%)	5 (6%)	21 (24%)	25	4	37	22	0.026
Infections/sepsis	78 (89%)	3 (3%)	7 (8%)	27	2	51	8	0.486
Untreated pain	72 (82%)	7 (8%)	9 (10%)	25	4	47	12	0.071

p value was calculated using Pearson's Chi-squared test and Fisher's exact test when appropriate. p <0.05 was considered as significant

**Knowledge and Current Practice-related Screening of ICU Delirium**

Significant proportion of non-PG-MOs had inadequate awareness on availability and experience in using CAM-ICU screening tool to screen ICU patients for delirium. Majority of the population did not adhere to the current recommendations on routine delirium screening (Table 5).

**Knowledge and Current Practice-related Preventive Methods (Tables 6 and 7)**

It is remarkable that more than 80% were aware, had good knowledge, about preventive methods. However, the routine practice on incorporation of preventive methods in patient management is inadequate.

**Table 5:** Current practices related to screening of ICU delirium

	Total responses (n = 88)		PGs (n = 29)		Non-PG-MOs (n = 59)		p value
	Yes	No	Yes	No	Yes	No	
Aware about the availability of screening tools	34 (39%)	54 (61%)	20 (69%)	9 (31%)	14 (24%)	45 (76%)	0.0005
Had ever screened a patient for delirium	24 (27%)	64 (73%)	13 (45%)	16 (55%)	11 (19%)	48 (81%)	0.009
Has experience in using CAM-ICU tool	23 (26%)	65 (74%)	18 (62%)	11 (38%)	5 (8%)	54 (92%)	0.0001
Routinely screen patients for delirium	11 (13%)	77 (87%)	5 (17%)	24 (83%)	6 (11%)	53 (89%)	0.493

p value was calculated using Pearson's Chi-squared test and Fisher's exact test when appropriate. p <0.05 was considered as significant

**Table 6:** Knowledge on preventive methods

Preventive method	Total responses (n = 88)			PGs		Non-PGs		p value
	Yes [n (%)]	No [n (%)]	Do not know [n (%)]	No/do not know		No/do not know		
				Yes	No	Yes	No	
Early mobilization	84 (96%)	–	4 (4%)	28	1	56	3	0.999
Reorientation	78 (89%)	2 (2%)	7 (8%)	27	2	50	7	0.711
Cognitive stimulation	74 (84%)	3 (3%)	10 (11%)	27	2	48	11	0.205
Reduction of nighttime light	73 (83%)	5 (6%)	10 (11%)	27	2	46	13	0.129
Reduction of nighttime noise	69 (78%)	5 (6%)	14 (16%)	25	4	42	17	0.183
Use of hearing aids and glasses when required	56 (64%)	7 (8%)	25 (28%)	22	7	34	25	0.105
Allowing frequent family visits	71 (81%)	8 (9%)	9 (10%)	25	4	46	13	0.406
Reduction of sedation to promote daytime wakefulness	79 (90%)	–	9 (10%)	28	1	51	8	0.261
Prevention of sleep deprivation	76 (86%)	2 (2%)	10 (11%)	28	1	48	11	0.094

p value was calculated using Pearson's Chi-squared test and Fisher's exact test when appropriate. p <0.05 was considered as significant

**Table 7:** Current practices related to preventive methods

Practice	Total responses (n = 88)		PGs (n = 29)		Non-PG-MOs (n = 59)		p value
	Routinely done	Not routinely done	Routinely done	Not routinely done	Routinely done	Not routinely done	
Early mobilization	56 (63%)	32 (37%)	20	9	36	23	0.491
Reorientation, day/night orientation	43 (49%)	45 (51%)	17	12	24	35	0.172
Cognitive stimulation, use of music and a clock	27 (31%)	61 (69%)	11	18	16	43	0.332
Reduction of nighttime light	29 (33%)	59 (67%)	10	19	19	40	0.815
Reduction of nighttime noise	17 (19%)	71 (81%)	7	22	10	49	0.566
Use of hearing aids and glasses if required	18 (21%)	70 (79%)	7	22	11	48	0.581
Allowing frequent family visits	30 (34%)	58 (66%)	14	15	16	43	0.058
Reduction of sedation to promote daytime wakefulness	44 (50%)	44 (50%)	16	13	31	28	0.999
Prevention of sleep deprivation	42 (48%)	46 (52%)	15	14	27	32	0.653

**Table 8:** Educational exposure related to ICU delirium

	Total responses (n = 88)		PGs (n = 29)		Non-PG-MOs (n = 59)		p value
	Yes	No	Yes	No	Yes	No	
Had lectures/training programs in recent years	23	65	17	12	6	53	0.000
Read journals/books on delirium	38	50	24	5	14	45	0.000

p value was calculated using Pearson's Chi-squared test and Fisher's exact test when appropriate. p <0.05 was considered significant

**Education Related to ICU Delirium (Table 8)**

There is a significant unmet need for education among non-PG-MOs (p <0.05) compared to PGs.

**DISCUSSION**

Remarkably, vast majority of the study population had a positive attitude toward delirium care in ICU, in terms of recognizing delirium as an important factor that increases morbidity, mortality,

and health care cost in ICU patients, that needs to be diagnosed and prevented. These findings are in line with the research findings of Davis and Maclullich, and Troglic et al.<sup>2,13</sup>

However, only a quarter of the population had ever screened a patient for delirium while 88% admitted that they do not routinely screen patients for delirium, revealing a disparity between the perceived importance and the current practice. Similar results were observed in studies conducted by Davis and Maclullich, Elliott, Xing et al., and Bellelli et al.<sup>13,15–17</sup>



Responses to the knowledge-based questions did indeed suggest that medical professionals who participated in the study had poor knowledge of the DSM-5 diagnostic criteria, CAM-ICU screening tools, and clinical features of hypoactive delirium, especially non-PG-MOs.

Although only 26% of medical professionals had experience in using CAM-ICU, 41% reported that they are confident in diagnosing delirium in ICU patients. Thus, it may be assumed that these professionals may have screened patients based on their clinical judgment. A study conducted by Devlin et al. suggests that respondents who use a nonstructured means rely primarily on features of hyperactive delirium, which is the least common subtype of delirium, thus missing the cases of hypoactive delirium, the common type, and missing around two-thirds of cases if a validated screening tool is not used.<sup>15</sup> Consequently, it may be hypothesized that many cases in our ICU setup are also undetected and undertreated. This highlights the need for new strategies to improve screening, such as incorporation of daily delirium screening into the ICU monitoring chart and motivation of medical staff to adhere into standard practice.

More than two-thirds of the participants recognized the cardinal features of delirium, inattention (74%), disordered cognition (68%), and acute onset of symptoms with a fluctuating course of severity during a day as essential criteria to diagnose (69%). These findings are in contrast to the findings of Davis and MacLulich, which revealed only 32% recognized inattention as a core diagnostic feature, while 67% regarded acute onset of symptoms as essential.<sup>13</sup> The results observed in our study may suggest that the participants possess adequate knowledge. However, the most striking feature observed was that only two (2%) respondents were able to correctly identify all the essential criteria of DSM-5. This suggests that although the respondents have some idea about delirium, they lack precise knowledge regarding the diagnosis of delirium, with results paralleling the findings of multiple studies.<sup>13,16,17</sup> Furthermore, half ( $n = 40$ ) of the population regarded that premorbid neurocognitive disorders should be absent to diagnose delirium, thus increasing the possibility of missing cases of delirium superimposed on other neurocognitive disorders. Only 15% correctly responded that the presence of evidence from history, physical examination, or laboratory findings that the disturbance is a direct consequence of another medical condition, substance intoxication, or withdrawal is a criterion to diagnose delirium. This again heightens the possibility of missing delirium diagnosis, rather it would be diagnosed in the context of the somatic disorder; for instance, a delirium triggered by hyponatremia will be diagnosed as a case of hyponatremia, with a reluctance to diagnose delirium. Diagnosis of delirium as delirium is important, as it is preventable and treatable with multiple, simple, and yet-effective nonpharmacological strategies.<sup>4</sup>

The highest gap in knowledge (between PGs and non-PG-MOs  $p < 0.05$ ) was observed concerning the recognition of clinical features of hypoactive delirium. Nearly 75% of non-PG-MOs failed to identify key features of hypoactive subtype,<sup>4</sup> though 66% were aware that there are different subtypes of delirium. This may be related to the fact that compared to non-PG-MOs, a significant proportion of PGs have an educational exposure to delirium in the form of lectures or discussions during their training. This lack of continuous education in non-PG-MOs needs to be recognized, and measures should be taken to minimize this issue.

Generally, the mixed subtype accounts for 53%, hypoactive for 35%, and hyperactive for 11%. However, it is notable that the only

study conducted in Sri Lanka regarding the incidence of delirium revealed that the majority (50%) belonged to the hypoactive subtype.<sup>7</sup> Therefore, it is highly likely that these cases of hypoactive and mixed subtypes, that comprise the majority, will go unnoticed and may be diagnosed as depression if this knowledge gap is not addressed accordingly. Underdiagnosis or failure to recognize features of hypoactive delirium is a common problem identified in many circumstances.<sup>4</sup> In such situations, it is commonly mistaken for depression.<sup>4</sup>

Interestingly, majority of participants (>75%) were aware of the common risk factors that trigger delirium in ICU patients. This is encouraging as the awareness of risk factors improves the prediction of high-risk cases in turn aiding early detection and treatment and motivating the treating team to implement preventive strategies early in the course.

In contrast to a study conducted by Zoran et al. where only 20% regarded delirium as preventable, 82% of our participants believed delirium is preventable. Astoundingly, more than 75% of our participants were aware of most of the preventive methods of ICU delirium. Almost all (99%) agreed that it is important to prevent delirium. Regrettably, this recognized importance was not reflected in their practice, without a remarkable difference between PGs and non-PG-MOs. The exact reason or the barriers for the inadequate incorporation of preventive strategies in managing critically ill patients are unclear, but the possibility of lack of knowledge on screening and diagnosis should not be disregarded as a cause for this occurrence.

Despite recent guidelines on delirium management and the recognition ICU delirium has received, about three-quarters of the population (significantly a higher proportion of non-PG-MOs) claimed that they have not received any training or lectures delirium management during the recent years, and this was in line with the results of a study conducted by Devlin et al. where 50% of the respondents had never received any education.<sup>15,18</sup> However, it is noteworthy that about 43% of our subjects, majority of PGs, attempted to refresh or gain knowledge through self-learning. This may be an important finding that indicates their positive attitudes toward delirium care and acquisition of knowledge. This gap in knowledge and unmet need for education needs to be recognized by the trainers and policymakers to improve and expand the scope of education and training related to delirium care such that it occupies a position proportionate to its clinical impact in Sri Lanka.

In summary, it is evident that the lack of appreciation of the significance of delirium and poor attitudes does not appear to be fundamental barriers to delirium management in relation to underdetection and undertreatment, among medical professionals participated in this study. Rather, lack of knowledge and inadequate current practice pertaining to screening modalities, diagnostic criteria, and preventive modalities appear to be more important, especially among non-PG-MOs.

One of the strengths in our study was the high response rate (76.4%), probably because the questionnaires were distributed and collected via paper and pen on the spot. However, this may have interfered with the in-depth thinking of participants which may have caused a response bias.

The other limitations are that this survey had included the response bias caused by the poor recollection of clinical experiences, or misunderstanding of questions as these were self-reporting responses. Besides, this survey only has included

ICUs in teaching hospitals in Central Province (five hospitals) in Sri Lanka, due to time restraints and limited human resources for data collection. Therefore, it may affect the generalizability of the results of this study.

## CONCLUSION

There is an encouraging positive attitude toward the importance, prevention, and management of delirium among all the doctors in the study population.

There is a lack of knowledge on delirium screening and diagnosis, probably related to an unmet need of education related to delirium care, especially among non-PG-MOs.

A discrepancy was observed between perceived importance, awareness on risk factors and preventive methods, and current practice related to screening and prevention among both PGs and non-PG-MOs.

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## LITERATURE REVIEW

### Delirium

Delirium is a syndrome defined by the DSM-5, as an acute onset of a fluctuating disturbance in the following cognitive functions: attention; environmental awareness; and cognition and/or perception.<sup>14</sup>

Following include the DSM-5 diagnostic criteria for delirium:<sup>14</sup>

- A. Disturbance in attention (i.e., reduced ability to direct, focus, sustain, and shift attention) and awareness (reduced orientation to the environment).
- B. The disturbance develops over a short period of time (usually hours to a few days), represents an acute change from baseline attention and awareness, and tends to fluctuate in severity during the course of a day.
- C. An additional disturbance in cognition (e.g., memory deficit, disorientation, language, visuospatial ability, or perception).
- D. The disturbances in Criteria A and C are not better explained by a preexisting, established, or evolving neurocognitive disorder, and do not occur in the context of a severely reduced level of arousal, such as coma.
- E. There is evidence from the history, physical examination, or laboratory findings that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal (i.e., due to a drug of abuse or to a medication), or exposure to a toxin, or is due to multiple etiologies.

### Risk Factors

There are multiple factors that increase the risk of delirium. Preexisting factors that increase a patient's vulnerability are termed predisposing risk factors. Factors that trigger the onset of delirium are classified as precipitating risk factors.

The established predisposing risk factors include cognitive impairment, increased age, and preexisting hypertension. Alcohol use, nicotine use, higher ASA grade, and cardiac disease are among the other suggested predisposing factors.<sup>4</sup>

The precipitating factors include the following:<sup>4</sup>

- Acute-illness-related factors—increased severity of illness; previous coma, multiple trauma; ventilatory support; sepsis; pain; and systemic hypoperfusion with metabolic acidosis.
- Medication-related factors—benzodiazepines, anticholinergic drugs, and opioids.
- Environmental factors—increased noise and lack of daylight.

While most triggering factors are modifiable, most of the predisposing risk factors are nonmodifiable.

### Incidence of Delirium

The prevalence of ICU delirium varies from 20 to 84% depending on severity of illness and the methods used to diagnose delirium.<sup>5,6</sup> with an average incidence rate of 29% during an ICU stay.<sup>4</sup> It is suggested that half of these cases become apparent within the first 2 days after admission to the ICU.<sup>4</sup>

A study conducted in Colombo National Hospital, Sri Lanka, by Lochanie and Ranawaka revealed that 66.6% of patients in surgical ICU suffered from delirium. The commonest subtype was

hypoactive delirium (50%) while hyperactive and mixed delirium accounted for 30 and 20%, respectively.<sup>7</sup>

### Clinical Features

Delirium has an acute onset. Common symptoms include disordered cognition and inattention that fluctuates over time, distractibility, reduced awareness of the environment, insomnia, daytime sleepiness, and disturbances in logic and perception manifesting as delusions or hallucinations.<sup>4</sup>

There are three main subtypes of delirium—hypoactive, hyperactive, and mixed motor subtypes, that are categorized according to psychomotor alterations. Of them, the mixed subtype is the most frequent type. The hypoactive is particularly underdiagnosed as it is characterized by reduced alertness, motor activity, and speech. These patients are often misdiagnosed as having depression, though depression is not characterized by a decreased level of consciousness. Hyperactive subtype is characterized by increased and inappropriate motor activity, restlessness, and sometimes agitation. Mixed type has mixed symptoms of hypoactive and hyperactive subtypes.<sup>4</sup>

### Adverse Outcomes of Delirium

The adverse outcomes of ICU delirium include increased duration of mechanical ventilation,<sup>8</sup> higher mortality,<sup>8</sup> prolonged ICU stay,<sup>9</sup> prolonged length of hospital stay,<sup>9</sup> self-removal of catheters, self-extubation, and increased costs.<sup>10</sup>

ICU delirium is also associated with long-term cognitive impairment, with impairment of memory, concentration, attention, executive function, and motor functions.<sup>5</sup> Evidence reveals that these impairments are persistent and affect employment, and some ICU survivors are resistant to significant improvement.<sup>11</sup>

### Diagnosis

The diagnosis of delirium is not difficult in critically ill ICU patients who develop a slightly altered level of consciousness with disturbed attention in the course of hours to few days. However, delirium is often underdiagnosed, and about 60–70% of cases are missed by ICU physicians and nurses. This lack of recognition may be attributed to the fact that delirium is so common, that it is not regarded as being unusual. Several screening tools have been developed to improve detection of delirium. The CAM-ICU and the Intensive Care Delirium Screening Checklist are the most frequently used tools in ICUs.<sup>4</sup>

### Prevention and Treatment of Delirium

#### *Nonpharmacological*

Patients in the ICUs are exposed to multiple risk factors that trigger delirium. Therefore, multifactorial approach, rather than a single intervention, seems to be more appropriate. These may include correction or treatment of predisposing and triggering factors if there are any early mobilization, reductions of nighttime light and noise, use of earplugs that increase exposure to daylight, and arranging reorientation program with cognitive training.<sup>12</sup>

Studies of multifactorial interventions reduce delirium focus mainly on reduction of cognitive impairment (by reorientation, cognitive stimulation, use of clocks and music), reduction of sedation and sleep impairment (by minimizing light and noise at

night), early mobilization, encouraging the use of hearing aids and glasses in cases of hearing or visual impairment, and encouraging family engagement.<sup>12</sup>

### *Pharmacological Interventions*

When pharmacological interventions are concerned, it is important to minimize the use of medications that may trigger or prolong ICU delirium, such as benzodiazepines and opioids.<sup>4</sup>

The use of opioids has contradictory evidence. As undertreated severe pain is also a predisposing factor for delirium, effective pain management with nonopioid analgesics/opioid sparing techniques must be considered when limiting opioid use.<sup>4</sup>

Dexmedetomidine can be used as an alternative to opioids and benzodiazepines as it has sedative and analgesic effects.<sup>4</sup>

Haloperidol is commonly prescribed, and it is the preferred agent for the treatment of psychosis in delirium, because of its rapid effects and the availability of intra-venous preparations.<sup>4</sup>

### **Barriers in Delirium Diagnosis and Management**

Delirium management is considered an essential component of routine care in ICU patients. However, it is revealed that systematic screening is not a part of daily routine in many ICUs.<sup>2</sup>

It is evident that delirium is widely underdiagnosed and undertreated when compared to other common and serious acute disorders, with 65–75% of cases of delirium going undetected.<sup>3</sup>

Previous surveys have revealed that various barriers may exist that impair effective management of delirium in ICU patients. These include lack of knowledge on delirium, low confidence in using screening tools, low perceived importance of delirium among medical professionals, fear of adverse events, workload concerns, and communication challenges.<sup>2</sup>

Studies conducted among medical professionals in UK and the Netherland revealed that there is a significant deficiency in the knowledge on delirium care and suggested that this could have contributed to the suboptimal care.<sup>2,13</sup>

A survey among intensive care unit physicians and nurses in the USA found that respondents thought delirium was common and serious, but that only 40% conducted routine screening, with 16% using specific assessment tools.<sup>13</sup>

Identification of these barriers would enable prompt correction of these limitations and contribute significantly to the improvement in the management of delirium in ICU setup. If the inadequate knowledge on delirium is found to be a main cause, simple interventions, such as educating the junior medical professionals through lectures and workshops and practicing the screening tools, would mitigate the problem of underdiagnosis and undertreatment.

Therefore, the principle aim of this study is to assess the knowledge and attitudes on delirium in ICU patients among medical professionals in teaching hospitals of Kandy district, and attempt to identify whether the lack of knowledge plays a role in underdiagnosis and undertreatment of delirium in ICU patients.