Intervention to improve intensive care nurses’ knowledge of sedation assessment and management

Vimala Ramoo, Khatijah L Abdullah, Patrick SK Tan, Li P Wong and Piaw Y Chua

ABSTRACT

Aims and objectives: To evaluate the impact of an educational intervention on nurses’ knowledge of sedation assessment and management.

Background: Sedation management is an integral component of critical care practice. It requires the greatest attention of critical care practitioners because it carries significant risks to patients. Therefore, it is imperative that nurses are aware of potential adverse consequences of sedation therapy and current sedation practice recommendations.

Designs and methods: A quasi-experimental design with a pre- and post-test method was used. The educational intervention included theoretical sessions on assessing and managing sedation and hands-on sedation assessment practice using the Richmond Agitation Sedation Scale. Its effect was measured using self-administered questionnaire, completed at the baseline level and 3 months following the intervention.

Results: Participants were 68 registered nurses from an intensive care unit of a teaching hospital in Malaysia. Significant increases in overall mean knowledge scores were observed from pre- to post-intervention phases (mean of 79.00 versus 102.00, \( p < 0.001 \)). Nurses with fewer than 5 years of work experience, less than 26 years old, and with only basic nursing education had significantly greater level of knowledge improvement at the post-intervention phase compared to other colleagues, with mean differences of 24.64 (\( p = 0.001 \)), 23.81 (\( p = 0.027 \)) and 27.25 (\( p = 0.0001 \)), respectively. A repeated-measures analysis of variance revealed a statistically significant effect of educational intervention on knowledge score after controlling for age, years of work and level of nursing education (\( p = 0.0001 \), \( \eta^2 = 0.431 \)).

Conclusion: An educational intervention consisting of theoretical sessions and hands-on sedation assessment practice was found effective in improving nurses’ knowledge and understanding of sedation management.

Relevance to clinical practice: This study highlighted the importance of continuing education to increase nurses’ understanding of intensive care practices, which is vital for improving the quality of patient care.

Key words: Educational intervention • Intensive care nurses • Nursing knowledge • Sedation assessment • Sedation management

BACKGROUND

Sedation and analgesia are commonly used in intensive care units (ICUs) to enhance patient comfort as they may experience distress because of their physical and psychological conditions (Jacobi et al., 2002; Mehta et al., 2006). These medications are necessary to reduce patient’s pain, fear, anxiety and sleep deprivation (Egerod et al., 2006; Jacobi et al., 2002). Sedation increases patient tolerance of endotracheal tubes and improves synchronization with mechanical ventilators through its anxiolytic effects, while its amnesiac properties decrease recall of unpleasant events (Jacobi et al., 2002; Feeley and Gardner, 2006).

However, providing an appropriate degree of sedation remains a challenge because the amount required varies with patient conditions and needs (Riker and Fraser, 2009; Jackson et al., 2010). There exists no standardized sedation dosage and the continuous infusion of sedatives based on established regimens carries significant risks to critically ill individuals (Kollef et al., 1998; Brook et al., 1999; Kress et al., 2000). The effects of undersedation and oversedation are well
documented in the literature. Prolonged mechanical ventilation, lengthened ICU and hospital stays, and ventilator-associated pneumonia are common complications associated with oversedation, whereas distress, ventilation intolerance, haemodynamic disturbances and adverse effects such as self-extubation have been linked to undersedation (Gehlbach and Kress, 2002; Pun and Dunn, 2007). Some of these complications may lead to more harmful consequences, prolonging the patient’s recovery period and increasing the incidence of ICU mortality and economic burden (Kollef et al., 1998; Girard et al., 2008).

Growing concerns about the impact of sedation on patients’ physical and psychological outcomes have led to increased scrutiny of the appropriate delivery of sedative agents. International guidelines recommend goal-directed sedation administration to meet patient needs and safeguard patient safety within the critical care environment (Jacobi et al., 2002; De Jonghe et al., 2005). The current literature suggests that the optimal level of comfort is achievable with light sedation, because excess sedation may lead to various complications (Treggiari et al., 2009; Strom et al., 2010; Salgado et al., 2011). Critical care practitioners are urged to standardize sedation management practice by adhering to particular strategies to optimize short- and long-term outcomes in mechanically ventilated patients (Mehta et al., 2006; de Wit and Devlin, 2008). Several clinical trials have reported improvements in the duration of mechanical ventilation and length of ICU and hospital stays, with fewer cases involving adverse effects as a result of a standardized sedation scoring system and a protocol-driven sedation approach (Kollef et al., 1998; Brook et al., 1999; Kress et al., 2000; De Jonghe et al., 2005; Quenot et al., 2007; Girard et al., 2008; Forhomayon et al., 2013).

Although management of sedation therapy involves a multidisciplinary team approach, nurses play a major role in ensuring that patients receive optimal sedation levels (Walker and Gillen, 2006). Nurses are responsible for monitoring the depth of sedation, titrating the infused drugs and monitoring their effects, while maintaining the sedation at a pre-targeted level. Protocols or guidelines may assist ICU nurses in making effective clinical decisions, but the effectiveness of sedation administration is still largely dependent on nurse-related factors such as knowledge, skill, experience and confidence. These factors contribute to inappropriate implementation of protocols and affect adherence to evidence-based sedation practices (Egerod, 2002; Walker and Gillen, 2006; Tanios et al., 2009). Furthermore, the assessment and delivery of pre-targeted sedation requires advanced levels of clinical judgement (Aveyard and Woolliams, 2006; Walker and Gillen, 2006; Aitken et al., 2009).

To successfully adopt evidence-based practice in the critical care environment and safely deliver sedation, educational programmes are essential to improve nurses’ sedation assessment and management capabilities (Feeley and Gardner, 2006; Walker and Gillen, 2006; Aitken et al., 2009). Therefore, the aim of this study was to assess the effectiveness of an educational intervention using theoretical educational sessions and hands-on sedation assessment practice to increase ICU nurses’ knowledge of sedation assessment and management.

METHODS
Design
A quasi-experimental design with a pre- and post-test approach was used. A pre-test was carried out at baseline before the intervention, and the post-test was conducted 3 months after the educational intervention was initiated.

Participants and study setting
The study was carried out within a 14-bed general adult ICU at a tertiary hospital in Kuala Lumpur, Malaysia, between December 2010 and October 2011. Ethical approval was obtained from the hospital’s Medical Ethics Committee.

The target population for this study was the registered nurses (hereafter referred to as nurses) working in the ICU with more than 6 months of work experience in critical care settings. All eligible nurses available during the study period were approached; a total of 68 nurses were recruited (90% of all registered nurses employed in the unit). The purpose and the voluntary nature of the study were explained to them. Participants were reassured of the anonymity and confidentiality of their survey responses.

Research instrument
A self-administered questionnaire was used to collect data during the pre- and post-tests. The questionnaire comprised two sections such as (1) demographics characteristics and (2) knowledge survey questions. Demographic data obtained in Section 1 assessed nurses’ age, level of nursing education and years of work experience as both a registered nurse and a nurse in a critical care unit.

Section 2 consisted of 26 items which measured knowledge of sedatives, sedation assessment and management; developed based on a review of existing studies and literature related to sedation assessments,
management and practice (Mehta et al., 2007; Devlin et al., 2008). The items were positively and negatively worded and scored with a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Negative items were reverse-scored. Total scores were summed, with the total score ranged from 26 to 130. Higher scores indicated higher levels of sedation assessment and management knowledge; scores below 80 (mid-point of the score is 78) indicated poor knowledge. At the pre-intervention phase, two additional questions were added to Section 1 assessing the nurses’ prior education regarding sedation management and their awareness of sedation management guidelines and protocols; these were removed at the post-intervention phase.

The reliability of the instrument was assessed in a pilot study with 20 critical care nurses participating in a post-basic critical care nursing programme, the questionnaire was administered at two different time points with an interval of 4 weeks. The test-retest reliability coefficient (r) of the knowledge scores was 0.87, indicating a good reliability. Ten critical care experts, including anaesthetists and senior nursing staff, reviewed and commented on the instrument’s clarity, content validity and comprehensiveness; revisions were made in line with their comments. The questionnaire was developed in English and then translated to Bahasa Malaysia (Malaysia’s national language) by a linguistic professional using a back-to-back translation approach. The final copy was administered in both languages.

Educational intervention
The intervention in this study consisted of theoretical educational sessions and hands-on practice assessing patient sedation levels. These components were designed to enhance the nurses’ knowledge and skills in assessing and managing patients with sedation therapy. Thus, a set of three formal educational sessions was carried out repeatedly over a 3-month period. Content for the teaching sessions was developed based on an extensive literature search and expert opinion. It covered topics related to the pharmacology of sedative drugs, assessment methods, current sedation management practices, and the benefits of guidelines and protocols. Two ICU anaesthetic lecturers and the researcher carried out the instruction through the unit’s bi-weekly in-house teaching schedules. Nurses were asked to attend all three sessions, each of which lasted 45 min to 1 h.

Following the teaching sessions, a validated sedation assessment scale (Appendix 1), was introduced into daily ICU practice. The Richmond Agitation Sedation Scale (RASS) was selected for its simplicity and excellent reliability and validity in comparison with other scales (Sessler et al., 2002). The researcher coached nurses on how to assess, score and document patient sedation levels using the sedation scale. Laminated copies of the sedation scale and a simplified version of the sedation guidelines were placed at each patient’s bedside for easy nurse reference.

Data collection
The questionnaire and a cover letter explaining both the study and the voluntary nature of participation were distributed to nurses during the pre- and post-intervention phases. The pre-intervention data collection occurred immediately prior to the first educational session, whereas the post-intervention data collection took place 3 months after the educational intervention was completed with the standardized sedation assessment practice in place. The 3-month interval was chosen to allow nurses to integrate the theoretical knowledge into practice and to develop experience in assessing and managing sedation therapy in critically ill patients. The nurses completed the survey within a period of 30–45 min at both phases without the use of reference materials; the principal investigator was present to answer study questions. Completion of the questionnaire implied consent.

Data analysis
Data were analysed using SPSS software (version 21). Demographic characteristics and knowledge scores were analysed using descriptive statistics (mean, standard deviation, frequency and percentage). Both pre- and post-intervention knowledge scores were assumed to be normally distributed because Kolmogorov-Smirnov tests indicated p-values of over 0.05; thus, parametric tests were used in the subsequent analyses. Univariate analysis (independent t-test and one-way analysis of variance) was used to assess the effect of demographic characteristics on knowledge scores. The effect of the intervention on knowledge scores was examined using repeated-measures analysis of variance. A p-value less than 0.05 was considered significant. Effect size interpretations were based on Cohen (1988) guidelines, where a $\eta^2 \geq 0.10$ indicates a small effect, $\pm 0.06$ a medium effect and $\pm 0.138$ a large effect.

RESULTS
Demographic characteristics
Sixty-eight nurses completed the questionnaire at the pre-intervention phase, but two dropped out because of premature resignation. Complete responses
were obtained from 66 nurses (response rate = 97%). About 40% (n = 26) of the nurses were in the 21–25 years age group; only 20% (n = 15) of participants were over 30 years old. Only 33% (n = 42) had more than 5 years of work experience as registered nurses. Most of the nurses had been working in critical care units since graduation, with years of experience as registered nurses closely mirroring their length of experience in critical care units. Table 1 displays the details of the results.

Most of the nurses (82%, n = 54) possessed nursing diplomas. Almost 90% (n = 59) of the respondents had never received any sedation assessment training. Four of the nurses who had such training cited continuing education programmes as their source of information about sedation assessment, whereas another three nurses noted that they attended out-of-hospital continuing education lectures. Sixty-two of 66 (94%) nurses were unaware of any existing sedation protocols or guidelines on sedation management of mechanically ventilated patients.

### Knowledge level on sedation assessment and management

To identify the level of nursing knowledge, knowledge scores were converted into percentages and categorized into four groups such as low knowledge (≤60%), medium knowledge (61–69%), fair knowledge (70–79%), and good knowledge (80–100%).

### Table 1 Mean scores and standard deviations for the 26 knowledge items

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Pre-intervention Mean (SD)</th>
<th>Post-intervention Mean (SD)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sedation assessment is an important nursing responsibility</td>
<td>4.03 (0.46)</td>
<td>4.44 (0.63)</td>
<td>0.172</td>
</tr>
<tr>
<td>2</td>
<td>Sedation is necessary for patient comfort</td>
<td>3.69 (0.96)</td>
<td>4.47 (0.68)</td>
<td>0.012*</td>
</tr>
<tr>
<td>3</td>
<td>Sedation requirements vary from patient to patient</td>
<td>1.34 (0.48)</td>
<td>4.27 (0.75)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>4</td>
<td>A target level of sedation is set individually based on each patient's need</td>
<td>3.11 (0.86)</td>
<td>4.51 (0.70)</td>
<td>0.001*</td>
</tr>
<tr>
<td>5</td>
<td>Patient’s illness severity must be taken into consideration when deciding the choice of sedative medications</td>
<td>3.43 (0.78)</td>
<td>4.48 (0.70)</td>
<td>0.001*</td>
</tr>
<tr>
<td>6</td>
<td>Sedation decreases the risk of developing depressive symptoms, delirium, and delusional memories of the ICU†</td>
<td>2.31 (1.18)</td>
<td>3.45 (1.08)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>7</td>
<td>Inappropriate sedation is associated with higher patient mortality</td>
<td>2.81 (1.10)</td>
<td>3.47 (1.06)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>8</td>
<td>All mechanically ventilated patients should be sedated because mechanical ventilation is stressful to patients†</td>
<td>3.07 (1.12)</td>
<td>3.48 (1.41)</td>
<td>0.054</td>
</tr>
<tr>
<td>9</td>
<td>A sedation scale is important because it enables caregivers to tailor sedation therapy to established clinical goals</td>
<td>3.52 (0.87)</td>
<td>4.62 (0.87)</td>
<td>0.007*</td>
</tr>
<tr>
<td>10</td>
<td>The patient is considered oversedated if he or she responds only to noxious stimuli</td>
<td>3.12 (1.14)</td>
<td>3.63 (0.96)</td>
<td>0.004*</td>
</tr>
<tr>
<td>11</td>
<td>It is not possible to treat pain without treating anxiety‡</td>
<td>3.21 (1.07)</td>
<td>3.56 (0.99)</td>
<td>0.068</td>
</tr>
<tr>
<td>12</td>
<td>Not having a cough reflex could indicate deep sedation in a mechanically ventilated patient</td>
<td>3.06 (1.25)</td>
<td>3.44 (1.16)</td>
<td>0.107</td>
</tr>
<tr>
<td>13</td>
<td>Sedation can be considered inadequate if the patient’s heart rate and blood pressure are elevated</td>
<td>3.57 (1.05)</td>
<td>3.74 (0.93)</td>
<td>0.406</td>
</tr>
<tr>
<td>14</td>
<td>A sudden disruption to sedation infusion can lead to withdrawal symptoms</td>
<td>2.34 (0.82)</td>
<td>3.70 (0.99)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>15</td>
<td>Sedation is rated as moderate if the patient is not easily aroused but responds purposely to painful stimulation‡</td>
<td>3.28 (0.84)</td>
<td>3.67 (1.03)</td>
<td>0.296</td>
</tr>
<tr>
<td>16</td>
<td>Midazolam should be used with caution in obese patients or those with renal failure because it could lead to accumulated and prolonged sedative effects</td>
<td>1.98 (1.15)</td>
<td>3.94 (0.87)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>17</td>
<td>The potential for opioid, benzodiazepine and propofol withdrawal should be considered after the administration of high doses for more than approximately 7 days of continuous therapy</td>
<td>3.17 (0.97)</td>
<td>3.86 (0.97)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>18</td>
<td>A common side effect of propofol is hypertension†</td>
<td>3.00 (1.13)</td>
<td>3.98 (0.95)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>19</td>
<td>The patient’s sedation goal and sedation score should be documented in the nursing report</td>
<td>4.30 (0.55)</td>
<td>4.38 (0.69)</td>
<td>0.410</td>
</tr>
<tr>
<td>20</td>
<td>Spontaneous ventilation is not adequate for patients with deep sedation</td>
<td>2.19 (1.12)</td>
<td>3.76 (1.08)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>21</td>
<td>Patients are considered undersedated if they are spontaneously moving their hands and feet†</td>
<td>2.94 (1.02)</td>
<td>3.62 (0.84)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>22</td>
<td>All mechanically ventilated patients should be sedated because caring for patients undergoing mechanical ventilation is stressful to nurses†</td>
<td>2.81 (1.17)</td>
<td>3.61 (0.99)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>23</td>
<td>The patient’s sedation goal and sedation score should be communicated during nursing handover reports at the shift change</td>
<td>4.01 (0.60)</td>
<td>4.13 (0.93)</td>
<td>0.343</td>
</tr>
<tr>
<td>24</td>
<td>A nursing-implemented sedation protocol has been shown to reduce the duration of mechanical ventilation</td>
<td>2.59 (1.12)</td>
<td>3.95 (0.88)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>25</td>
<td>Sedation doses should be tapered systematically to prevent withdrawal symptoms</td>
<td>3.32 (1.09)</td>
<td>4.06 (1.03)</td>
<td>0.009*</td>
</tr>
<tr>
<td>26</td>
<td>Daily interruption of sedative infusions has been shown to decrease the duration of mechanical ventilation</td>
<td>2.79 (0.93)</td>
<td>3.86 (1.02)</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level (two-tailed).
†– Negative statements were reversed scored.
(70–79%), and good knowledge (≥80%). As shown in Fig. 1, at the pre-intervention phase, about 59% of the nurses had knowledge scores of 60% and below, and none of the nurses had a good understanding of sedation assessment and management (>80%). These results indicated that nurses generally had less knowledge of sedation assessment and management at the pre-intervention phase. At the post-intervention phase, about 59% of the nurses had fair knowledge scores (70–79%), whereas 41% had good knowledge levels (Fig. 1).

A repeated-measures ANOVA showed significant differences in knowledge scores among the two phases (mean score = 79.00, SD = 7.61 versus mean score = 102.00, SD = 5.81). Wilk’s Lambda = 0.06, F(1, 65) = 1111.41, p = 0.0001 with a large effect size (multivariate partial $\eta^2$ = 0.95). This indicates that the nurses’ knowledge was significantly higher after the educational intervention.

Item analysis revealed that many of the responses scored mean values that were lower than the midpoint (3.0) of the Likert scale at the pre-intervention phase, especially items 3, 6, 7, 14, 16, 20, 21, 22, 24 and 26 (mean scores ranged from 1.34 to 2.94), indicating low knowledge levels (Table 1). However, significant increases in mean scores were noted for most items at the post-intervention phase, with scores of 3.50–3.99 reported, reflecting moderate knowledge levels. Items 1, 19 and 23 (addressing nurses’ responsibilities in sedation assessment and the importance of communicating information on patient sedation goal and level) had higher mean scores at both phases (mean scores ranged from 4.01 to 4.30 at pre-intervention and 4.13 to 4.44 at post-intervention).

The results also revealed that generally there were increments in knowledge level for all the nurses at post intervention phase. It was also noted that at both pre- and post-intervention phases, nurses with more than 5 years of work experience, above-basic education and over 30 years of age had higher mean scores than nurses younger than 30, with less experience, and only basic nursing diplomas. However, significant differences in knowledge scores according to differences in demographic characteristics (age, length of work experience as registered nurses and critical care nurses, and nursing education level) were noted only at the pre-intervention phase, suggesting the post-intervention knowledge level was not influenced by their demographic characteristics.

Analyses of knowledge improvement scores (post-intervention knowledge scores minus pre-intervention knowledge scores) revealed that there were statistically significant differences for all demographic characteristics tested: age groups, F(2, 63) = 1.19, p = 0.001; years of experience as a registered nurse, t(64) = 3.412, p = 0.001; years of experience working in a critical care unit, t(64) = 3.506, p = 0.001; and level of education, t(64) = 2.259, p = 0.027. The results also showed that nurses with fewer than 5 years of experience as registered nurse and in critical care settings, those who were less than 26 years old, and those with only a basic nursing diploma had gain significantly greater level of knowledge improvement at post-intervention phase compare to their other colleagues (Table 2).

A further analysis to test whether pre- and post-intervention knowledge scores differed significantly after controlling for demographic variables indicated that differences between pre- and post-intervention knowledge scores remained significant, Wilk’s Lambda = 0.569, $F$ (1, 61) = 46.20, $p$ = 0.0001, $\eta^2$ = 0.431 with a large effect size.

**DISCUSSION**

The findings indicated that nurses generally had insufficient knowledge of sedation assessment and management prior to the intervention. On the pre-test questionnaire, nurses obtained relatively low scores for most items, especially those related to sedatives, indicators of sedation levels and evidence-based practices related to sedation management. This finding was in line with the fact that the nurses’ exposure to sedation assessment was very limited. Most of the nurses had never received sedation assessment training before taking part in this study, and they were unaware of existing sedation management guidelines.

At the post-intervention phase, nurses scored higher for most questionnaire items, indicating better understanding of aspects related to sedation assessment and management. Therefore, the educational intervention, which included hands-on practice, may be effective in improving nurses’ knowledge of sedatives, sedation management and confidence.
assessment and management. This finding is concordant with other studies demonstrating positive results from educational interventions used to improve nursing knowledge (Howell et al., 2000; Patiraki et al., 2006; Huth et al., 2010; Scott et al., 2013).

In contrast to the findings of Randen and Bjork (2010), who reported that more than half of the nurses surveyed did not perceive sedation documentation as important in deciding upon sedation needs, the nurses in present study acknowledged the importance of communicating information related to patients' sedation levels and sedation management during shift reports, and through nursing documentation at both phases. Nurses in this study believed that nurses, in general, play an important role in sedation assessment. Similar findings were reported in previous research (Walker and Gillen, 2006). However, it is difficult to determine the degree to which this is actually reflected in clinical practice without further investigation. Further studies to audit sedation scoring and nursing documentation would be beneficial in assessing nurses’ competence and attitudes towards sedation practice. Nursing and medical studies frequently link negative attitudes to poor adherence to guidelines on sedation management (Egerod, 2002; Pun and Dunn, 2007; Guttormson et al., 2010). Because knowledge shapes attitude (Patiraki et al., 2006), efforts to improve nurses’ knowledge are essential.

Demographic characteristics did not significantly influence nurses’ knowledge at the post-intervention level in this study, although generally there were increases in knowledge level for all the nurses. This suggests that nurses’ post-intervention knowledge level was not influenced by their demographic characteristics. However, significant differences were noted between knowledge improvement scores and demographic variables. Younger nurses with less experience and only basic nursing diplomas had gained greater level of knowledge than their more experienced colleagues after undergoing the educational intervention. Although it is difficult to form concrete explanations for this finding, this indicates the potential benefit of continuing educational programmes for developing awareness and understanding of critical care practice in younger and/or less experienced nurses. Appropriate support and education from the beginning of their careers may help nurses develop competence in critical care nursing (West, 2006).

A major limitation of this study was that it assessed a single ICU from a single hospital; thus, our findings might not represent ICU nurses throughout Malaysia or other parts of the world. Despite this limitation, the present findings support the use of educational initiatives to improve nurses’ knowledge of sedation assessment and management. Although there are studies examined critical care nurses’ knowledge through educational intervention in other areas such as on pressure sore prevention (Tweed and Tweed, 2008), delirium (Gesin et al., 2012) and pain management (Erkes et al., 2001), to the best of our knowledge, this study is the
first assessment of an educational intervention aimed at nursing knowledge related to sedation assessment and management of mechanically ventilated patients.

Conclusions and nursing implications
This study suggests that nurses are able to develop greater awareness and understanding by participating in educational interventions. The significant knowledge improvement observed for the majority of the items in this study is promising. In addition, repeated assessment of nurses’ knowledge could help to identify when refresher training is needed.

Taking into account the effect of sedation administration on patient safety, sedation assessment should be considered equally as vital as any other cardiopulmonary parameter assessment, and should be part of standard intensive care monitoring parameters. Educational initiatives focusing on developing sedation assessment and management competencies in critical care nurses should be part of in-house ICU practice improvement efforts. Ongoing educational programmes with current updates on sedation practice are also necessary to enhance understanding and knowledge retention among nurses, as knowledge and skills may decline over time.

WHAT IS KNOWN ABOUT THIS TOPIC
- Recent research suggests that sedation monitoring using sedation scales has benefited mechanically ventilated patients.
- Nurses have vital roles in assessing and managing critically ill patients’ sedation therapies and nurses’ involvement has leads to positive outcome for mechanically ventilated patients.
- Effective and safe sedation management relies on appropriate knowledge and requires advanced clinical judgement and decision-making skills.

WHAT THIS PAPER ADDS
- This article highlights the importance of educational strategies to promote effective assessment and optimal management of sedation therapy among intensive care nurses.
- This article reinforces the effectiveness of educational intervention that includes hands-on sedation practice in improving nurses’ knowledge and understanding of sedation assessment and management.

REFERENCES


### APPENDIX 1

Richmond Agitation-Sedation Scale (RASS)

<table>
<thead>
<tr>
<th>Score</th>
<th>Terms</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Comatose</td>
<td>Overly combative or violent; immediate danger to staff</td>
</tr>
<tr>
<td>+3</td>
<td>Very Agitated</td>
<td>Aggressive and pulls or removes tube(s) or catheter(s)</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated</td>
<td>Frequent non-purposeful movement or patient-ventilator dysynchrony</td>
</tr>
<tr>
<td>+1</td>
<td>Restless</td>
<td>Anxious or apprehensive but movements not aggressive or vigorous</td>
</tr>
<tr>
<td>0</td>
<td>Alert and Calm</td>
<td>Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact to voice</td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy</td>
<td>Briefly (less than 10 seconds) awakens with eye contact to voice</td>
</tr>
<tr>
<td>-2</td>
<td>Light Sedation</td>
<td>Any movement (but no eye contact) to voice</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate Sedation</td>
<td>No response to voice, but any movement to physical stimulation</td>
</tr>
<tr>
<td>-4</td>
<td>Deep Sedation</td>
<td>No response to voice</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable</td>
<td></td>
</tr>
</tbody>
</table>