

# A Turkish Version of the Critical-Care Pain Observation Tool: Reliability and Validity Assessment

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**Purpose:** The study aim was to evaluate the validity and reliability of the Critical-Care Pain Observation Tool in critically ill patients.

**Design:** A repeated measures design was used for the study.

**Methods:** A convenience sample of 66 patients who had undergone open-heart surgery in the cardiovascular surgery intensive care unit in Ordu, Turkey, was recruited for the study. The patients were evaluated by using the Critical-Care Pain Observation Tool at rest, during a nociceptive procedure (suctioning), and 20 minutes after the procedure while they were conscious and intubated after surgery.

**Finding:** The Turkish version of the Critical-Care Pain Observation Tool has shown statistically acceptable levels of validity and reliability. Inter-rater reliability was supported by moderate-to-high-weighted  $\kappa$  coefficients (weighted  $\kappa$  coefficient = 0.55 to 1.00). For concurrent validity, significant associations were found between the scores on the Critical-Care Pain Observation Tool and the Behavioral Pain Scale scores. Discriminant validity was also supported by higher scores during suctioning (a nociceptive procedure) versus non-nociceptive procedures. The internal consistency of the Critical-Care Pain Observation Tool was 0.72 during a nociceptive procedure and 0.71 during a non-nociceptive procedure.

**Conclusions:** The validity and reliability of the Turkish version of the Critical-Care Pain Observation Tool was determined to be acceptable for pain assessment in critical care, especially for patients who cannot communicate verbally.

**Keywords:** intensive care unit, open-heart surgery, pain, validity, reliability.

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Conflict of interest: ■ ■ ■ ■ ■

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**CRITICALLY ILL PATIENTS** in intensive care units (ICUs) may experience moderate to severe pain<sup>1-3</sup> due to acute illness, surgery, trauma, invasive or noninvasive procedures, immobility, and nursing interventions.<sup>4</sup> Of these nursing interventions, endotracheal suctioning, positioning, catheter placement, dressing, drain, or chest tube removal procedures, endotracheal tube removal has been previously identified to be major sources of pain.<sup>5,6</sup> In their study conducted with 300 critical-care patients, Eti-Aslan et al<sup>7</sup> reported that chest tube, endotracheal suctioning, and

dressings were the processes causing severe pain in critical-care patients.

Pain assessment is the most important step in the management of pain. It is very difficult to assess pain objectively since pain is a subjective and multidimensional concept.<sup>8</sup> Although pain is usually assessed with the use of self-reports,<sup>9</sup> critically ill patients are often unable to provide a self-report on the presence and intensity of pain, because of a reduced level of consciousness, endotracheal intubation, or the use of sedatives or muscle relaxants.<sup>4,10</sup> The widely used pain assessment scales such as Visual Analog Scale, Numerical Analog Scale, Faces Pain Scale, McGill Pain Questionnaire, and Brief Pain Inventory may not be appropriate assessment tools for critically ill patients due to the above-mentioned reasons in pain assessment.<sup>11</sup> However, other valid and reliable measures are clearly required to assess pain in nonverbal patients even though self-reporting is the most reliable way of assessing pain.<sup>12</sup> A number of studies have shown that behavioral assessments provide a relatively valid and reliable means of assessing pain in nonverbal patients, and various behavioral pain assessment tools have been developed, one of which is the Critical-Care Pain Observation Tool (CPOT).<sup>4,13,14</sup>

The CPOT was originally developed by G elinas et al<sup>15</sup> based on the findings of a literature review. This tool evaluates four behavioral domains: facial expression, body movement, muscle tension, and ventilator compliance/vocalization. Items in each section are scored from 0 to 2, with a possible total score ranging from 0 to 8. Its content validity was verified with 14 critical-care nurses and physicians.<sup>16</sup> The CPOT was tested among different ICU groups, including cardiac surgery patients<sup>15</sup> and patients with a variety of diagnoses, such as trauma, surgical, and medical cases.<sup>17</sup>

## Literature Review

The first step in providing adequate pain relief for patients is systematic and consistent assessment and documentation of pain.<sup>13,18</sup> Pain intensity may be quantified using behavioral-physiological scales in nonverbal patients but health care professionals' bias may influence perceptions of the patients' suffering.<sup>19</sup> The 2004 Thunder Project II identified behaviors displayed during procedures in 5,957

critically ill adult patients at 169 sites.<sup>20</sup> In this study, patients who reported pain ( $n = 4,278$ ) during a procedure (ie, turning, suctioning, wound care, device removal) displayed five behaviors: grimacing (43%), rigidity (27%), wincing (24%), shutting of eyes (34%), and verbalization of complaints (24%).<sup>20</sup> To identify pain behaviors in critically ill patients, G elinas et al<sup>21</sup> conducted a retrospective review of 183 pain episodes that occurred in the first 72 hours after the patients were intubated. Pain behaviors such as facial expressions, agitation, movement, compliance with ventilator were identified in nurses' notes 73% of the time, while physiological indicators (ie, blood pressure, heart rate, arrhythmia) were found only 24% of the time. These studies led to the development of pain measurement tools in nonverbal critically ill patients.<sup>15,20,21</sup>

Measurement is fundamental for nursing practice and research. A measurement is an expression of observation results by numbers after observing certain object(s) on whether they possess certain characteristics.<sup>22</sup> Various tools are developed and tested in the nursing discipline to evaluate health status, results of nursing interventions, or the perception of the care given. Since nursing is a scientific practice-based discipline, selection of the most appropriate measurement tool is important.<sup>16</sup> In this context, the purpose of the study was to provide a measurement tool in the Turkish literature to facilitate assessing pain levels of mechanically ventilated patients who experience pain frequently in ICUs. Pain is a subjective and multidimensional concept. However, development of observational or behavioral pain scoring systems is recommended since there may be no self-reporting of pain in patients in ICUs.<sup>23</sup>

No tool is universally accepted for use in the nonverbal patient today. Although various tools have been developed for use in nonverbal patients,<sup>18,24</sup> they are not used in the ICUs in Turkey.<sup>25</sup> This may cause inadequate pain assessment in critically ill patients.<sup>13,14</sup> The aim of our study was to evaluate content validity of the Turkish version of the CPOT to be used for pain assessment, assess the internal consistency reliability of the measure, and evaluate its concurrent and discriminant validity. These study results will contribute to objective pain assessments performed by critical-care nurses in Turkey.

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