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Applicability of scales/indicators for pain monitoring in critically ill patients incapable of verbalizing: a systematic review of the literature

Aplicabilidad de escalas/indicadores para el control del dolor en pacientes críticamente incapaces de verbalizar: una revisión sistemática de la literatura

A. F. Fernandes de Sá Araújo Freitas[1], M. Fernandes[1,2], R. M. Dourado Marques[3] and J. S. Ramos Freitas[1,4]

[1]Enfermeira Especialista do Centro Hospitalar Lisboa Norte, EPE. Hospital Universitário de Santa Maria. Lisboa, Portugal. [2]Mestre em Enfermagem à Pessoa em Situação Crítica, Especialista em Enfermagem Médico-Cirúrgica. [3]Professora Adjunta da Escola Superior de Saúde da Cruz Vermelha Portuguesa. Enfermeira Especialista em Enfermagem Médico-Cirúrgica. Doutora em Enfermagem. Lisboa, Portugal. [4]Mestre em Psicologia Educacional, Douturando em Enfermagem do Ciclo de Estudos ISC/UCP. Lisboa, Portugal

ABSTRACT

Objective: To conduct a systematic review of the existing literature about the applicability of scales/indicators for pain monitoring in critically ill patients who are unable to verbalize.

Methods: We performed a systematic review of the literature, according to the Joanna Briggs Institute's guidelines, in the following databases: MEDLINE, CINAHL, and Cochrane Central Register of Controlled Trials. The search was executed using, as main descriptors, "Critically Ill Patient", "Pain", "Scale" and "Instrument", in Portuguese, English, Italian, and Spanish. We considered the period between January 2012 and December 2017, and obtained a total of 149 results. From these, we selected 11 final full-text articles for extraction and analysis, which met the required inclusion criteria. Two researchers made the search and two independent reviewers carried out the critical evaluation, extraction and synthesis of the data.

Results: The key to adequate pain management lies in detecting and assessing several indicators, such as: facial expression, vocalization, body movements, muscle tone, adaptation to mechanical ventilation. Subsequently, it is fundamental to intervene accordingly and to reassess the patient's status. The BPS (Behavioral Pain Scale) and the CPOT (Critical-care Pain Observation Tool) are considered the most appropriate scales for pain assessment in criti-

RESUMEN

Objetivo: Llevar a cabo una revisión sistemática de la literatura existente sobre la aplicabilidad de escalas/indicadores para el control del dolor en pacientes críticamente enfermos que no pueden verbalizar.

Métodos: Se realizó una revisión sistemática de la literatura en las siguientes bases de datos: MEDLINE, CINAHL y el Registro Cochrane Central de Ensayos Controlados, como descriptores principales "Paciente en estado crítico", "Dolor", "Escala" e "Instrumento". Consideramos el periodo entre enero de 2012 y diciembre de 2017, y obtuvimos un total de 149 resultados. De estos, seleccionamos 12 artículos finales de texto completo para extracción y análisis, que cumplieron con los criterios de inclusión requeridos. Dos revisores independientes llevaron a cabo la evaluación crítica, extracción y síntesis de los datos.

Resultados: La clave para el manejo adecuado del dolor radica en detectar y evaluar varios indicadores, tales como: expresión facial, tamaño de la pupila, vocalización, movimientos corporales, tono muscular, adaptación a la ventilación mecánica, presión arterial y frecuencia cardiaca. Posteriormente, es fundamental intervenir en consecuencia y reevaluar el estado del paciente. La BPS (Escala de dolor conductual) y la CPOT (herramienta de observación del dolor en cuidados críticos) se consideran las escalas más adecuadas para la evaluación del dolor

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CORRESPONDENCE: Rita Margarida Dourado Marques
ritamdmarques@gmail.com

cally ill patients who are incapable of verbalizing. While the BPS should only be used in ventilated patients, the CPOT can be used in both ventilated and non-ventilated patients.

Conclusion: The BPS and the CPOT are two scales recognized as reliable, valid, and easy to apply, for pain monitoring in critically ill patients who are unable to verbalize their pain.

Key words: Pain, critically ill, monitoring, scales, indicators.

en pacientes críticos que son incapaces de verbalizar. Si bien el BPS solo se debe utilizar en pacientes ventilados, el CPOT se puede usar tanto en pacientes ventilados como no ventilados.

Conclusión: el BPS y el CPOT son dos escalas reconocidas como confiables, válidas y fáciles de aplicar para el control del dolor en pacientes críticamente enfermos que no pueden verbalizar su dolor.

Palabras clave: Dolor, paciente crítico, monitoreo, escalas, indicadores.

INTRODUCTION

Pain continues to be a symptom which is almost constantly present in critically ill patients. Its ineffective assessment and control are associated with an increase in mortality and morbidity (1). The situation experienced by the patient is further aggravated by the difficulty to communicate, as well as by the fear and anxiety inherent to being admitted to an Intensive Care Unit (ICU). These circumstances manifest themselves through changes in several areas: level of consciousness, sleep, circulatory, endocrine, metabolic, gastrointestinal, and psychological (2-4).

However, although the changes caused by pain are well known —as well as the fact that it constitutes a stressor agent for ICU patients—, the rates of uncontrolled pain in critically ill patients remain high (5), and pain continues to be undervalued (6). The American Association of Critical-Care Nurses (1) mentions that critically ill patients experience pain throughout their hospitalization. More than 30 % of ICU patients feel pain when resting, while more than 50 % feel pain during routine care procedures (mostly nursing interventions, which include the aspiration of secretions, positioning, and wound care, among others).

Pain can be manifested through vocalizations, movements/mobility, facial expressions, mood or behaviors (2), and remains one of the challenges when providing care to critically ill patients (2,7). Pain cannot be accurately assessed if we take into account only physiological factors, because they might be affected by various phenomena, such as anxiety and sepsis (8). Therefore, it is important to promote the systematic use of adequate assessment tools, which are sensitive to behavioral indicators. These instruments allow the implementation and optimization of both pain relief and pain control strategies (9), reducing long-term complications (10).

Uncontrolled pain, due to an inadequate assessment and the ensuing non-intervention, may result in complications during the patient's recovery process, and, consequently, in additional treatment costs (11). As a major outcome, pain may evolve and become chronic, commonly leading to various psycho-social effects, such as depression, anxiety, delirium, and post-traumatic stress (2).

Thus, the provision of an effective pain management to the patient, through the correct use of appropriate assessment tools, and the consequent intervention and reassessment, will allow the obtainment of several health benefits, such as a reduction in mechanical ventilation time, a decrease in healthcare-associated infection rates, and a decline in hospitalization length within the ICU (6,10).

In this sense, nurses, being a professional group favored by its prolonged contact and close proximity with respect to the patient/family, play a key role in pain monitoring, as well as in the adjustment of treatment plans, since pain may undergo some changes (3). Hence, this study tried to review, in a systematic manner, the existing literature about the scales/indicators which are available for pain monitoring in critically ill patients incapable of verbalizing. Additionally, we attempted to identify the applicability of the scales used for pain assessment in critically ill patients who are unable to verbalize their suffering.

METHODOLOGY

This study was conducted according to the methodology recommended by the guidelines of the Joanna Briggs Institute for Evidence Based Practice (11). It was oriented by the following research question that was developed in the PEO format: (P) Population (Type of Participantes) - Critically ill patients incapable of verbalizing; (E) Exposure of interest (Independent variable) – Scales/Indicators for pain monitoring; (O) Outcome (Independent variable) – Applicability.

We defined inclusion and exclusion criteria (Table I) within the following categories: participants (selection of studies regarding critically ill patients, who were unable to verbalize, and presented an age greater than, or equal to, 18 years); Exposure (Scales/Indicators for pain monitoring); Outcome (applicability of scales/indicators for pain assessment); and available documents (selection of articles which were accessible in full text, and were published in Portuguese, English, Italian, or Spanish, between January 2012 and December 2017). Additionally, all works concerning non-original or qualitative studies were excluded.

Search strategy

Our systematic review of etiology was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (12), in order to achieve the standards which are usually required for this type of work.

TABLE I
INCLUSION AND EXCLUSION CRITERIA APPLIED IN THE SYSTEMATIC LITERATURE REVIEW (SLR)

Selection criteria	*Inclusion criteria*	*Exclusion criteria*
Participants	Critically ill patients, unable to verbalize, with an age greater than, or equal to, 18 years	Children, and adult patients capable of verbalizing
Exposure	Studies that refer to the use of Scales / Indicators for pain monitoring	Studies that refer to the application of other strategies to assess pain
Outcome	Applicability of scales / indicators for pain assessment	No evidence the applicability of scales / indicators for pain assessment

Regarding the search that was performed within the databases, two researchers started the search by inserting the search terms. In order to identify the specific database descriptors, we resorted to several keywords of articles related to the theme under study. Subsequently, the resulting descriptors were included in the Major Heading (MH) option, and were consulted in the Health Sciences Descriptors (DeCS) catalogue.

We then conducted a systematic review, encompassing the articles published in journals indexed in the following databases: MEDLINE, CINAHL and Cochrane Central Register of Controlled Trials. To that purpose, we used the descriptors "*Doente Crítico*" ("Critically Ill Patient"), "*Dor*" ("Pain"), "*Escala*" ("Scale") and "*Instrumento*" ("Instrument"), together with some variations of these terms, both in Portuguese ("*doente crítico*" AND "*dor*" AND "*escala*" OR "*instrumento*") and in English ("critical patient" OR "critically ill patient" AND "pain" AND "scale" OR "instrument"), which were obtained through the combination of the Boolean operators AND, and OR.

In a first phase, the titles and abstracts of all the articles previously identified through the search strategy were carefully read, in order to select the works that answered the guiding question and met the inclusion criteria. This reading process, together with the evaluation of the evidence's quality, was performed by two independent researchers, to ensure a critical assessment during the articles' selection procedure. The abstracts which did not present sufficient information regarding inclusion and exclusion criteria were selected for further analysis of the entire text. Subsequently, the same researchers assessed, in an independent manner, the full-text articles, selecting the studies according to the eligibility criteria. Due to some disagreements among the researchers, we requested the intervention of a third evaluator.

The assessment of the studies' quality was achieved through a tool proposed by the Joanna Briggs Institute (12): the Critical Appraisal Checklist for Descriptive/Case Series. In the absence of any guidelines concerning the operationalization of the classification grid used to evaluate the studies' quality, we adopted the following criteria, considering the percentage of the global items: low quality, when less than 50 % of the items were met; moderate quality, when 50 % to 75 % of the items were met; and high quality, when more than 75 % of the items were met.

RESULTS

A total of 149 studies, classified as potentially relevant, were obtained through this systematic review's search strategy; 22 of these articles were considered not qualified, due to duplication, or through the employment of the search limiters; 95 were set aside after title reading; and 13 were excluded after abstract reading. The remaining 19 articles were then subjected to an eligibility assessment, through full reading. Finally, 11 studies, which fully met the pre-established inclusion criteria, were included in the systematic review (Figure 1).

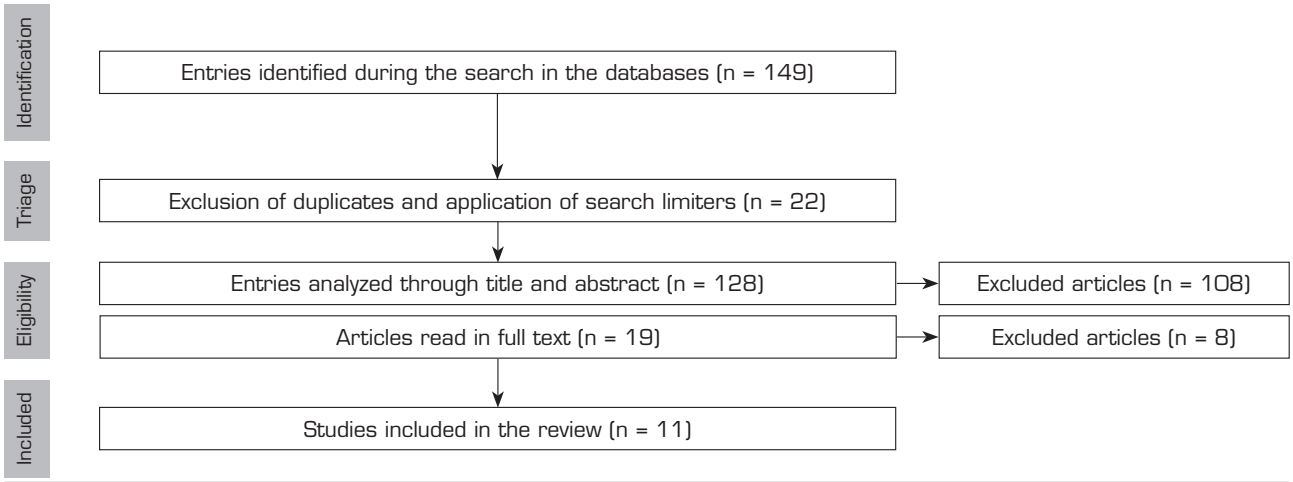

Fig. 1. Flowchart of the studies' selection process.

According to the previously mentioned criteria for methodological quality assessment, 10 articles were considered of high quality, while the remaining 2 were considered of moderate quality. The bibliographic identification of the included studies is shown in Table II.

The extraction and synthesis of the information contained in the 11 selected studies was performed by two researchers, who used a standardized method that encompassed the following aspects: identification, objectives, methodology, results and conclusions (Table II).

Regarding the analyzed articles, 5 aimed to validate the Critical-care Pain Observation Tool (CPOT) behavioral scale for the respective population (6,8,16), 2 were related to the CPOT's implementation for pain assessment in patients incapable of verbalizing (5,10), and the remaining 5 intended to evaluate and compare the sensitivity of pain assessment scales — including the Behavioral Pain Assessment Scale (BPS) and the CPOT — in critically ill patients(2,3,7,9).

DISCUSSION

While conducting this systematic review of the available literature, we found that the application of pain assessment tools is essential for achieving effective and documented pain assessment procedures (5). Some studies demonstrate the validation of pain assessment tools, which proved to be valid and reliable (2,5,6,8,10,13,16) for the respective population. The results indicate that the BPS (2,3,16) and the CPOT (2,5,6,11,12-14) are the most appropriate scales for pain monitoring in critically ill patients. These evaluation instruments are the most studied and also the most widely applied. Nevertheless, two works (3,7) concluded that the Adult Non-Verbal Pain Scale (ANVPS), the Confort Scale, the Faces Scale, and the Pain Assessment Behavioral Scale (PABS) as well as BPS for Non-Intubated Patients (BPS-NI) (2) were just as valid and equally sensitive to pain responses during painful procedures. This occurred both in the patients who were able to verbalize and in the patients who were unable to do so. However, to avoid an ineffective pain assessment, the same authors emphasize the importance of taking into account the Faces Scale's subjectivity, whenever it is chosen (7).

Considering that the BPS and the CPOT are the scales of choice for pain assessment in critically ill patients, we investigated the existence of comparative studies between these two instruments. In one of those studies, both scales are considered valid for pain assessment in critically ill patients experiencing pain. Nonetheless, the BPS showed score changes both at rest and with the introduction of a painful stimulus, unlike the CPOT, which only suffered alterations in the presence of a painful stimulus (6). This indicates that the CPOT is the preferred tool for pain assessment in the studied population.

One of the works revealed that pain monitoring through the CPOT resulted in the administration of fewer painkillers and sedatives, as well as in shorter ventilation and hospitalization periods (10). Another study demonstrated that, despite being an effective scale to assess the pain in patients incapable of verbalizing it, the CPOT should be used with caution in cases of chronic pain, or delirium (6).

On the other hand, because the BPS should only be used in ventilated patients, it is considered that the CPOT should be preferred in non-ventilated critically ill patients, who present awareness and communication alterations (6,8,9).

Currently, the BPS is the only pain assessment scale validated for the Portuguese population, having been selected by the *Sociedade Portuguesa de Cuidados Intensivos* (the Portuguese Intensive Care Society). However, given that this scale should only be used in ventilated patients, it becomes essential to validate the CPOT in the near future, to provide a more comprehensive pain assessment in critically ill patients. According to several studies, the CPOT is the most appropriate tool when the patient is no longer sedated, nor ventilated, but remains incapable of verbalizing pain for various reasons — such as, for example, an alteration of the awareness state —, because the "adaptation to the ventilator" assessment item can be replaced by the "patient's vocalization" (6,14).

In the absence of pain assessment tools, the nurses' description of the pain phenomenon is recorded in the form of a narrative, with body movements being the most frequent descriptive element. This confirms the need to continue the research efforts to improve care through the implementation, and consequent use, of pain assessment behavioral scales in critically ill patients (11).

It is disturbing to note that 23 % of the patients who were admitted to ICUs did not benefit from a documented pain assessment during their entire hospitalization period (17). This is in line with the results obtained in previous studies. The remaining patients had their pain assessed in the form of a narrative, with behavioral indicators being often used.

Concerning the future, it is fundamental to develop guidelines, which orient healthcare professionals towards an effective pain management. Additionally, there should be a consensual model, involving a shared decision process, with the participation of nurses and other healthcare professionals (12).

In order to obtain better clinical results, it is essential to establish updated guidelines specifying the use of assessment tools, such as behavioral scales, in critically ill patients who are unable to verbalize pain (6). This need exists because pain monitoring in orotracheally intubated patients — thus, incapable of verbalizing — is fairly recent, and pain remained undocumented (10), which resulted in a higher prescription of opioids (around half of the patients admitted to ICUs was medicated with opioids). According to the same authors, pain monitoring through behavioral instruments allows the attainment of health gains — such as a decrease in the patients' ICU hospitalization period, as well as in the invasive ventilation period (6) —, thus improving the patient's/family's satisfaction level (10).

Additionally, two studies (3,13) were conducted to explore the challenges faced by nurses regarding pain management, and also to understand how they documented the presence of pain in their patients. It was found that pain management remains a priority in the provision of nursing care. However, when managing pain, nurses con-

TABLE II
SYNTHESIS OF THE INFORMATION EXTRACTED FROM THE 12 STUDIES INCLUDED IN THE SLR, FOLLOWING A STANDARDIZED METHOD THAT IDENTIFIES THE STUDY, AS WELL AS ITS OBJECTIVES, METHOD, RESULTS AND CONCLUSIONS

Study	*Author(s) /Year/ Country*	*Objective*	*Method*	*Results*	*Conclusions*
1 (10)	Arbour C, Gélinas C, Michaud C (2011). Canada	To explore the impact of the CPOT's implementation (assessment before and after implementation) on pain management, in ventilated trauma patients admitted to ICUs	Pre-experimental design, encompassing the review of 30 medical files (15 up to 1 year before CPOT implementation and 15 up to 6 months after CPOT implementation)	Stronger analgesics and a greater number of sedatives were administered before CPOT implementation. Also, before CPOT implementation, almost half of the patients were ventilated during more than 96 hours, while in the post-implementation group only 4 patients were ventilated for more than 96 hours ($p > 0.05$). Additionally, the hospitalization period was shorter in the post-implementation group	Pain assessment scales, such as the CPOT, are highly recommended. Acute pain management seems to be associated with a decrease in long-term complications, so it would be interesting to explore the impact of CPOT implementation on pain management, as well as on the development of chronic pain and post-traumatic stress
2 (13)	Nürnberg Damström D, Saboonchi F, Sackey P, Björling G (2011). Sweden	To validate the Swedish version of the CPOT. To assess the CPOT's discriminant validity, during a nociceptive procedure (NP) and a non-nociceptive procedure (NNP) To assess the CPOT's criterion validity, during a NP and a NNP	Observational descriptive study, with quantitative analysis. Conscious and unconscious adults were observed during two procedures: one nociceptive (positioning) and one non-nociceptive (arm and face washing)	This validation of the CPOT's Swedish version revealed adequate reliability measures among evaluators, as well as appropriate internal consistency and discriminant validity	The results of the CPOT's Swedish version show that it is an appropriate tool for pain assessment in critically ill adult patients, whether conscious or not
3 (14)	Linde S, Badger J, Machan J, Beaudry J, Brucker A, Navedo Roy R, et al. (2013). Iceland	To validate the CPOT scores for pain assessment, during a painful procedure and a non-painful procedure, simultaneously, through the observation of two nurses	Observational descriptive study, with quantitative analysis. Thirty patients were included, over a 5-month period. Observational data was collected, from patients who were intubated after heart surgery, during routine procedures — both non-painful (catheter dressing change) and painful (positioning)	The mean CPOT scores did not increase significantly during the non-painful procedure, but they increased significantly during the painful procedure	The results support the findings of previous studies on the CPOT's feasibility and reliability for pain assessment in orotracheally intubated adult patients

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Study	*Author(s) /Year/ Country*	*Objective*	*Method*	*Results*	*Conclusions*
4 (5)	Rose L, Haslam L, Dale C, Knechtel L, McGillion M (2013). Canada	To determine the effects of CPOT application on the frequency of pain assessment recording and on the administration of painkillers, sedatives, and opiates, in patients unable to verbalize their pain	Pre-experimental design, with quantitative analysis. Data was collected in two ICUs of a university hospital, being recorded within a maximum of 72 hours before and after CPOT implementation, in the Cardiovascular ICU (130 patients before and 132 after) and in the Medical/Surgical/ Trauma Unit (59 patients before and 52 after)	The proportion of pain assessment intervals with documented pain assessment increased in both units. The total median dose of opioid and benzodiazepines decreased	CPOT implementation increased the frequency of pain assessment and seemed to influence the administration of painkillers in both units
5 (6)	Echegaray-Benites C, Kapoustina O, Gellinas C (2014). Canada	To validate the CPOT in adult critically ill patients who underwent neurosurgery	Descriptive and prospective study, with repeated CPOT evaluations. Forty-three patients, submitted to elective surgery at a university hospital in Canada, participated in the study. The participants were identified and submitted to pain assessment through the CPOT, before, during, and after a non-nociceptive stimulus (non-invasive arterial pressure measurement), as well as a nociceptive stimulus (positioning), resulting in a total of 6 assessments. Data concerning pain self-assessment was also obtained	Discriminant validity was confirmed by higher CPOT values during the nociceptive procedure, when compared to the non-nociceptive procedure. Most patients reported higher pain intensity during positioning, when compared to arterial pressure measurement. Criterion validation was confirmed by a moderate positive correlation between the verbalization of pain intensity and the CPOT score, during positioning. The CPOT score's inter-relational reliability, assessed by two trained evaluators who viewed the participants' videos, was confirmed by high correlation coefficients between pairs	The analyzed data demonstrates the CPOT's validity and reliability, regarding pain assessment, in neurocritical patients incapable of verbalizing subjected to elective surgery

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Study	*Author(s) /Year/ Country*	*Objective*	*Method*	*Results*	*Conclusions*
6 (2)	Liu Y, Li L, Herr K (2015). China	To evaluate, and compare, the reliability and validity of two observational pain assessment tools, in critically ill patients hospitalized in ICUs, both orotracheally intubated and not intubated	Observational prospective study, conducted with a convenience sample of 117 adult patients in a critical condition, who were admitted to a university hospital ICU, in China. Pain was assessed before, and during, routine care procedures, both painful (secretion aspiration through the orotracheal tube) and non-painful (arterial pressure measurement), using CPOT and BPS (both the original BPS and the BPS for non-intubated patients were employed)	A total of 608 assessments were performed, using CPOT and BPS. Reliability, assessed through a CPOT and BPS re-test, was 0.950 and 0.941, respectively. The overall pondered weight between the two CPOT and BPS evaluators was 0.973 and 0.955, respectively. CPOT and BPS scores were significantly higher during painful procedures, in comparison to non-painful procedures and to rest periods before painful procedures. There was a strong correlation between the two scales, with appropriate limits	Both scales (CPOT and BPS) proved to be reliable and valid to assess pain, in intubated, as well as non-intubated, Chinese patients
7 (7)	Rahu M, Grap M, Ferguson P, Joseph P, Sherman S, Elswick R (2015). USA	To evaluate the validity and sensitivity of 6 pain assessment scales (Adult Non-Verbal Pain Scale [ANVPS]; Behavioral Pain Scale [BPS]; Confort Scale; Faces Scale; Face Legs, Activity, Crying and Consolability [FLACC] Scale; Numeric Pain Rating Scale [NPRS]), in order to identify the best pain measurement tool in non-communicative patients	Observational descriptive study, with quantitative analysis, performed with a sample of 50 critically ill ICU patients capable of verbalizing, and 100 patients unable to do so, due to mechanical ventilation. They were observed before, and during, routine physical examination (non-painful procedure) and endotracheal tube aspiration (painful procedure)	All pain assessment scales showed moderate to high correlations, with patient verbalization, during endotracheal tube aspiration. Also during this procedure, the patients' Faces scores presented a higher correlation with the patients' numeric rating scores ($p < 0.001$). The associations between BPS and numeric scores, during the routine physical examination, were the weakest ($p = 0.20$). All scales were sensitive with regards to the observation of pain responses in all phases ($p < 0.001$). The sensitivity was higher during endotracheal tube aspiration ($p < 0.001$). The highest pain score was attributed on the Faces Scale, by the patients, as well as the researchers	The pain assessment scales applied to adult critically ill patients unable to verbalize are valid, and sensitive, to evaluate changes in pain responses, both in patients capable of verbalizing and in those incapable of doing so. However, one should pay attention to the application of the FACES Scale, because its subjectivity can lead to an excessive, or deficient, pain assessment

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Study	*Author(s) /Year/ Country*	*Objective*	*Method*	*Results*	*Conclusions*
8 (9)	Rijkenberg S, Stilma W, Endeman H, Bosman R, Oudemans-van Straaten H (2015). Netherlands	To compare the CPOT's and the BPS's discriminant validity and reliability, with respect to mechanically ventilated patients, hospitalized in an adults' ICU	Observational prospective study. A total of 68 mechanically ventilated patients, incapable of verbalizing, were observed. Pain was assessed using BPS and CPOT, when they were resting shortly before a non-painful procedure, and also during that procedure. The same assessment was performed when they were resting shortly before a painful procedure, as well as during that procedure	The BPS and CPOT scores showed a significant increase of 2 points between the rest period and the painful procedure (positioning). The average BPS score between the rest period and the non-painful procedure (oral hygiene) showed a significant increase of 1 point, while the average CPOT score remained unchanged. The reliability of the BPS and CPOT scores showed a good agreement (0.74 and 0.75, respectively)	The BPS and the CPOT are reliable and valid for pain assessment in ICUs, although most indicators showed an increase during painful procedures. The BPS's discriminant validity was less supported, because it increased with non-painful stimuli, unlike the CPOT, which is the preferred tool in this group
9 (3)	Al Darwish Z, Hamdi R, Fallatah S (2016). Saudi Arabia	To identify the reliability and the validity of non-verbal pain assessment tools, such as the BPS, the Adult Non-Verbal Pain Scale (ANVPS), and the CPOT, in order to evaluate pain in critically ill patients who are unable to verbalize	Observational descriptive study, with quantitative analysis, conducted over a 3-month period, on a sample of 47 critically ill patients hospitalized in an ICU, who were unable to verbalize. Three pain assessment tools were employed — BPS, CPOT and ANVPS —, before, during and after positioning, as well as endotracheal aspiration	The BPS was the most valid and appropriate tool to assess pain in ICU patients who did not communicate verbally. Nonetheless, the CPOT was considered an appropriate alternative. Routine procedures, such as secretion aspiration, were pain-causing elements in all patients, regardless of painkiller administration through infusion	All pain assessment tools were considered reliable and valid

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Study	*Author(s) /Year/ Country*	*Objective*	*Method*	*Results*	*Conclusions*
10 (8)	Frandsen J, O'Reilly Poulsen K, Laerkner E, Stroem T (2016). Denmark	To validate the Danish version of the CPOT	Observational descriptive study, with quantitative analysis, conducted on a sample of 70 critically ill patients. These were observed during a non-nociceptive procedure (arm washing), as well as during a nociceptive procedure (positioning in bed). The patients were observed before, during, and 15 minutes after, both interventions (6 evaluations). Two observers, with no visual contact with each other, collected the data and assigned the CPOT scores.Interactive reliability, criterion validity, and discriminant validity, were calculated	The results indicated a good correlation between the two evaluators. About 48 patients (68.6 %) were able to verbalize pain. A significantly higher mean CPOT index was found during the nociceptive procedure, than at rest, or during the non-nociceptive procedure. No correlation was found between CPOT scores and physiological indicators. In patients with self-reported pain and a CPOT score, there was a significant correlation between the two. A CPOT score ≥ 3 was correlated with the patients' verbalized pain	It was concluded that the CPOT can be used to assess pain in critically ill patients. It can also be used when the ICU has a non-sedation protocol. The CPOT scores showed good a reliability and correlated well with the pain verbalized by the patients
11 (15)	Hylén M, Akerman E, Alm-Roijer C, Idvall E (2016). Sweden	To translate, and validate, the BPS scale for Swedish critically ill patients	Observational descriptive study, with quantitative analysis. The BPS scale was translated and adapted into Swedish. Subsequently, it was tested in 20 patients (10 of them intubated, and the remaining 10 not intubated). The scale was applied before, and after, potentially painful procedures	When tested in critically ill patients, the Swedish version of the BPS showed a reliability of 85 %. The same tool also demonstrated adequate discriminant validity, between the assessment performed at rest and the assessment conducted after a painful procedure	The Swedish version of the BPS is suitable to assess pain in patients who are unable to verbalize it

tinue to recognize some limitations with respect to their autonomy, which could be overcome through the implementation of pain assessment scales and the respective action protocols (3). It is the nurse's responsibility — as well as his/her professional duty — to provide effective pain relief, bearing in mind that, if sedatives and painkillers are being administered to a patient, he/she may seem misleadingly calm and without pain (18). Endotracheal intubation emerged among the painful procedures more frequently reported by patients admitted to ICUs.

Concerning pain indicators, the studies evaluated: facial expression, body movements, muscle tone, adaptation to mechanical ventilation and vocalization (3,14). When approaching critically ill patients, nurses are in a privileged position to assess their behaviors. Therefore, these professionals should be sensitized and encouraged to use behavioral assessment scales (3).

CONCLUSION

Pain is a subjective symptom that is difficult to assess and to characterize in critically ill patients, having an impact on their general condition and their recovery.

The present work aimed to perform a systematic review of the existing literature regarding of the applicability of scales/indicators to available for pain monitoring in critically ill patients who are unable to verbalize.

Taking into account that pain is an ever-present sign in ICU patients, possessing knowledge about the most appropriate pain scales and indicators may contribute to an improvement in practices.

The obtained results suggest that, to achieve an effective pain management in critically ill patients, it is fundamental to assess pain using behavioral scales such as the BPS and the CPOT. In the analyzed articles it's evident the need of a instrument that considers indicators such as: facial expression, body movements, muscle tone, adaptation to mechanical ventilation and vocalization.

In Portugal, the BPS has been validated and it is the scale most commonly used to assess pain in critically ill patients, however, given that the BPS should only be applied to ventilated patients, but not all the patients incapable of communicating are ventilated, the CPOT, PABS and BPS-NI, emerges as an alternative, because they can be applied to both ventilated and non-ventilated patients unable to verbalize, whether they are sedated or not. Most studies refer to the CPOT as being the most reliable when evaluating the pain in patients who are unable of communicate.

For all these reasons, and based on the obtained data, we can state that it is possible to improve the care provided to critically ill patients experiencing pain, through its monitoring. This improvement contributes to the administration of fewer painkillers and sedatives, as well as shorter ventilation and hospitalization periods, having an impact on treatment effectiveness. Finally, a more effective treatment produces health gains and has lower costs for the institutions.

Therefore, according to the obtained results, it is essential to validate the CPOT for the Portuguese population, as well as to conduct studies that emphasize the experiences of hospitalized patients who were prone to pain during their hospital stay. In addition, there is a need for studies which demonstrate the effectiveness of non-pharmacological interventions, so that the latter can be used simultaneously with pharmacological ones, in order to enhance results with a greater safety and lower costs, thus improving care practice.

CONFLICT OF INTEREST

Authors declare no conflicts of interest.

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