A systematic review of the pain scales in adults: Which to use?

Ozgur Karcioglu, Hakan Topacoglu, Ozgur Dikme, Ozlem Dikme

Abstract

Objective: The study analysed the Visual Analogue Scale (VAS), the Verbal Rating Scale (VRS) and the Numerical Rating Scale (NRS) to determine: 1. Were the compliance and usability different among scales? 2. Were any of the scales superior over the other(s) for clinical use?

Methods: A systematic review of currently published studies was performed following standard guidelines. Online database searches were performed for clinical trials published before November 2017, on the comparison of the pain scores in adults and preferences of the specific patient groups. A literature search via electronic databases was carried out for the last fifteen years on English Language papers. The search terms initially included pain rating scales, pain measurement, pain intensity, VAS, VRS, and NRS. Papers were examined for methodological soundness before being included. Data were independently extracted by two blinded reviewers. Studies were also assessed for bias using the Cochrane criteria.

Results: The initial data search yielded 872 potentially relevant studies; of these, 853 were excluded for some reason. The main reason for exclusion (33.7%) was that irrelevance to comparison of pain scales and scores, followed by pediatric studies (32.1%). Finally, 19 underwent full-text review, and were analysed for the study purposes. Studies were of moderate (n = 12, 63%) to low (n = 7, 37%) quality.

Conclusions: All three scales are valid, reliable and appropriate for use in clinical practice, although the VAS is more difficult than the others. For general purposes the NRS has good sensitivity and generates data that can be analysed for audit purposes.

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Keywords: Acute pain, Pain score, Pain scale, Pain intensity, Pain management, Emergency department

1. Pain in the emergency department

Acute pain is one of the most common chief complaints reported by most patients admitted to the ED, while its perception and expression...
have great variations between countries [1]. The definition of pain by International Association for the Study of Pain (IASP) as ‘an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage’ is accepted worldwide [2].

Subjective and multidimensional nature of the pain experience render pain assessment really challenging. In the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) guidelines, implementation of this standard in clinical practice comprised the addition of pain as the “fifth” vital sign to be noted in the context of initial assessment; the use of pain intensity ratings; and posting of a statement on pain management in all patient care areas. Supplemented with regular pain reassessments, the schedule of pain reassessment should be driven by patients’ pain severity [3].

Pain estimations need to be elicited and recorded to highlight both the presence of pain and the efficacy of pain treatment. The patients’ perception of pain should be documented during the initial assessment of a patient. Current evidence provides a general recommendation that pain needs to be evaluated and managed within 20–25 min of initial healthcare provider assessment in the ED [4]. Pain treatment should be targeted to a goal of reducing the pain score (e.g., by 50%, below 4/10, or referred to as mild/moderate or severe) rather than a specific analgesic dose [5].

2. Pain scores and documentation of pain

The patient’s self-report is the most accurate and reliable evidence of the existence of pain and its intensity, and this holds true for patients of all ages, regardless of communication or cognitive deficits [6].

In the absence of objective measures, the clinician must depend on the patient to supply key information on the localization, quality and severity of the pain. Although physicians commonly question the reported pain scores, the pain must be documented within 2–25 min of initial healthcare provider assessment in the ED [4]. Pain treatment should be targeted to reducing the pain score (e.g., by 50%, below 4/10, or referred to as mild/moderate or severe) rather than a specific analgesic dose [5].

2.1. B.1

The VAS is the most widely used tool for estimating both severities of pain and to judge the extent of pain relief [8]. Healthcare worker asks the patient to select a point on a line drawn between two ends to express how intense he/she perceives pain (Fig. 1). The VAS is a continuous scale composed of a horizontal (HVAS) or vertical (VVAS) line, usually 100 mm long, anchored by two verbal descriptors (i.e., “no pain” and “worst imaginable pain”) [9, 10]. Patients are asked to rate “current” pain intensity or pain intensity “in the last 24 h”.

The VAS is an easy-to-use instrument which does not warrant using a sophisticated device. It is also highly sensitive in detecting treatment effects, and its results can be analysed by parametric tests [11]. Minimal translation difficulties have led to an unknown number of cross-cultural adaptations [10]. Although this tool is suitable for use with older children and adults, the need for a marking and for being able to visualize and mark the line, can make the VAS impractical to use in the emergency situation. On the other hand, most experts believe that the VAS offers little practical advantage over verbal reports in the clinical practice [5].

2.2. B.2

The numeric rating scale (NRS) is a single 11-point numeric scale broadly validated across myriad patient types. Data obtained via NRS are easily documented, intuitively interpretable, and meet regulatory requirements for pain assessment and documentation [12]. To date, findings demonstrated that even in the chaotic prehospital phase most acute care patients allow evaluation via a simple “zero-to-10 scale” or NRS reliably, respecting their pain levels [13]. Like the pain VAS, minimal language translation difficulties support the use of the NRS across cultures and languages [14].

Evidence indicated that patients really want to give a pain number, rather than simply relate whether they want analgesia. Strengths of this measurement is the ability to be administered both verbally (therefore by telephone) and in writing, as well as its simplicity of scoring. However, similar to the pain VAS, the pain NRS evaluates only 1 component of the pain experience, pain intensity, and therefore does not capture the complexity and idiosyncratic nature of the pain experience or improvements due to symptom fluctuations [10].

NRS is a commonly used tool necessitating the patient rate his pain on a scale from 0 to 10, with 0 indicating no pain and 10 reflecting the worst possible pain (Fig. 2). NRS are often conducted as a scale from 1 to 10 which does not give the patient a solution to indicate no pain at all. It can be used with children who are able to understand numbers. The pain scores are interpreted as:

- 0 = no pain
- 1–3 = mild pain
- 4–6 = moderate pain
- 7–10 = severe pain

NRS can be used with most children older than 8 years of age, and behavioral observation scales are required for those unable to provide a self-report [15]. For patients with cancer-related pain, the NRS is the most frequently used instrument to measure pain intensity [16]. Goulet et al. examined the agreement and correlation of electronic medical record-based ratings of NRS and self-administered NRS in 1643 adult patients [17]. The correlation was high, but the mean electronic medical record-based NRS score was significantly lower than the survey score (1.72 vs. 2.79; p < 0.0001).

2.3. B.3

Verbal Pain Scores (VPSs), Verbal Rating Scales (VRS) or Verbal Descriptor Scales: These tools may discern those patients who are truly in pain but who may not express their discomfort, as well as influence the physician to inquire about the patient’s pain.

VRS consist of a number of statements describing increasing pain intensities (Fig. 1). Patients are told to choose the word which best describes their pain intensity. The number of descriptors used has ranged from four (none, mild, moderate, severe) to 15 [18]. For patients who have limited literacy or cognitive impairment, use of these scales may be difficult, and they do not provide the number of choices available with the VAS or NRS, thus potentially limiting precision [19].

This article reviews the current literature to provide systematic data regarding the results from comparative studies on unidimensional
assessment of pain intensity using the NRS, VRS, or VAS. The following points were investigated to determine evidence-based recommendations:
- Were the compliance and usability different among scales?
- Were any of the scales superior over the other(s) for clinical use?

3. Methods

A systematic review of currently published studies was performed following standard guidelines. Online database searches were performed for randomized controlled trials published before November 2017, on the comparison of the pain scores in adults and preferences of the specific patient groups. A literature search via the Cochrane Central Register of Controlled Trials, PubMed/Medline, Clinical Key, EMBASE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and BIOSIS was carried out for the last fifteen years on English Language papers. Published studies evaluating the patients' preferences and usability of the pain intensity scales were targeted. The reference lists of retrieved articles were used to generate more papers and search terms. Data were independently extracted by two blinded reviewers. The discrepancies, on the other hand, were resolved by the primary author. The research protocol to answer these questions was registered in PROSPERO, the International Prospective Register of Systematic Reviews (registration number is: CRD42017080974).

3.1. Search methodology

A comprehensive literature search was carried out using the following strategy:

Online searches were performed using the following search keywords and terms: ('pain assessment' OR 'pain intensity' OR 'pain score' OR 'pain comparison' OR 'pain scale' OR 'acute pain' OR 'pain rating') AND ('emergency' AND 'acute' AND 'score'). The search was limited to human studies (clinical trials) conducted on adults and published in English.

3.2. Study selection, data screening and critical appraisal

The study included all comparative trials conducted to assess the use of commonly used scales measuring acute pain intensity and to compare them with each other on specific patient groups, exclusively in adults. All RCTs of any duration that investigated pain scores in comparison to each other were identified. All potentially eligible papers were critically appraised, with the emphasis on evidence from randomized trials and international guidelines rather than smaller studies, case
series and case reports. Reference lists of relevant systematic reviews and all included studies were checked to identify additional eligible articles. Conference abstracts and proceedings were not deemed eligible for inclusion in the review. Citation titles and abstracts were independently screened and assessed regarding the methodological quality by two reviewers (H.T. and O.D.). Any disagreements between the two reviewers were then resolved by consensus or in consultation with a third reviewer (O.K.) if needed.

3.3. Quality assessment and risk of bias

Eligible clinical studies were rated regarding the quality of evidence as per GRADE guidelines and assigned to one of four groups: High (A), moderate (B), low (C) and very low (D) quality [20].

Studies that met the inclusion criteria for the review were assessed for bias using the risk of bias criteria developed by Cochrane’s EPOC group [21] which is based upon Cochrane’s Risk of Bias Tool [22]. Studies were assessed with regard to selection bias, performance bias, detection bias, attrition bias, reporting bias, and other sources of bias. Studies were rated as “low risk of bias (L),” “high risk of bias (H),” or “unclear risk of bias (U)” on a general impression after evaluating all criteria (Table 1).

4. Results

The initial electronic data search yielded a total of 872 potentially relevant studies; of these, 853 were excluded for some reason, and finally 19 trials fully met the selection criteria based on inclusion of information regarding comparative data on the pain scales, and specific populations’ preferences on the scales (Fig. 2). The main reason for exclusion (33.7%, 288/853) was that irrelevance to comparison of pain scales and scores, followed by pediatric studies (32.1%, 274/853).

Data collected for the review of the 19 clinical studies included in the analysis of the pain scales used in the acute setting were tabulated and summarized (Table 1). With respect to quality of evidence per GRADE guidelines, there were 12 (63%) moderate quality (B) and 7 (37%) low quality (C) evidence derived from the studies.

Fig. 2. Flow diagram of study selection for systematic review to compare the clinical use of three commonly used pain rating scales, namely the Visual Analogue Scale (VAS), the Verbal Rating Scale (VRS) and the Numerical Rating Scale (NRS).
Table 1
Main characteristics of the outstanding human studies that were explained and reviewed in the present study.

<table>
<thead>
<tr>
<th>Investigator (s), title and date, Ref.</th>
<th>Sample size and population</th>
<th>Quality of evidence (GRADE)*</th>
<th>Risk of bias**</th>
<th>Objectives</th>
<th>Findings</th>
<th>Notes, conclusions</th>
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</thead>
<tbody>
<tr>
<td>McLean et al. 2004. [13]</td>
<td>1227 prehospital patients &gt; 13 yrs old</td>
<td>C</td>
<td>H</td>
<td>To determine the feasibility of prehospital pain measurement among patients 13 yrs of age or older using a VRS and NRS.</td>
<td>Prehospital pain assessment using a VRS and NRS was feasible in this patient population. Further studies are needed to confirm this in other settings.</td>
<td>An 11-point scale is preferable for prehospital practice and could also be useful for research applications. Pain assessment using a VRS and NRS can be implemented with minimal paramedic training. The discrepancy between NRS and VAS scores suggests that pain intensity cannot be determined accurately according to pain scales alone but should also incorporate clinical judgment. Pain measurements among institutionalized elderly can be made by NRS and VDS; however, the preferred scale for the elderly was the VDS, regardless of gender.</td>
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<td>Leigheb M et al. 2017. [23]</td>
<td>137 adult ED patients</td>
<td>B</td>
<td>H</td>
<td>To evaluate the intensity and location of pain experienced by patients in the ED, the time to analgesic therapy in the ED, and the patient’s satisfaction so to identify potential interventions to improve management.</td>
<td>The magnitude of NRS pain measurements were higher than VAS measurements.</td>
<td>There were moderate to strong, positive and statistically significant associations between the scores of NRS and VDS: overall assessment (r = 0.75), the rest (r = 0.92) and movement (r = 0.87). Higher mean scores were associated in NRS to higher categories of pain intensity in VDS. The association between the mean scores of NRS with the categories of VDS was significant, indicating convergent validity and a similar metric between the scales.</td>
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<tr>
<td>Pereira et al. 2015. [24]</td>
<td>101 institutionalized elderly</td>
<td>C</td>
<td>U</td>
<td>Correlating two unidimensional scales for measurement of self-reported pain intensity for elderly and identifying a preference for one of the scales.</td>
<td>There were moderate to strong, positive and statistically significant associations between the scores of NRS and VDS: overall assessment (r = 0.75), the rest (r = 0.92) and movement (r = 0.87). Higher mean scores were associated in NRS to higher categories of pain intensity in VDS. The association between the mean scores of NRS with the categories of VDS was significant, indicating convergent validity and a similar metric between the scales.</td>
<td>Although all of the 5 pain intensity rating scales were psychometrically sound when used with either age group, failures, internal consistency reliability, construct validity, scale sensitivity, and preference suggest that the VDS is the scale of choice for assessing pain intensity among older adults, including those with mild to moderate cognitive impairment. Pain measurements among institutionalized elderly can be made by NRS and VDS; however, the preferred scale for the elderly was the VDS, regardless of gender.</td>
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<tr>
<td>Herr KA et al. 2004. [25]</td>
<td>175 younger (&lt;25 yrs) adults</td>
<td>B</td>
<td>U</td>
<td>To determine: (1) the psychometric properties and utility of 5 types of commonly used pain rating scales when used with younger and older adults, (2) factors related to failure to successfully use a pain rating scale, (3) pain rating scale preference, and (4) factors impacting scale preference.</td>
<td>All 5 pain scales (VAS, FPS, VDS, 21-point NRS, 11-point VNS) were effective in discriminating different levels of pain sensation; however the VDS was most sensitive and reliable. Failure rates for pain scale completion were minimal, except for the VAS. The scale most preferred to represent pain intensity in both cohorts of subjects was the VRS, followed by the VDS.</td>
<td>In terms of pain scale preference, the NRS (33%) was the preferred scale in the cognitively intact group and the FPS-R (54%) was the preferred scale in the cognitively impaired group. African-Americans and Hispanics preferred the FPS-R. Severely, moderately, and mildly impaired participants also preferred the FPS-R. The NRS, FPS, VPS, and VDS were appropriate pain rating scales for the participants in this study, and that the VAS should be used in combination with one of these scales.</td>
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<tr>
<td>Ware LJ et al. 2006. [26]</td>
<td>68 cognitively impaired minority sample</td>
<td>C</td>
<td>H</td>
<td>To determine the reliability and validity of selected pain intensity scales including the FPS-R, VDS, NRS, and Iowa Pain Thermometer (IPT) with a cognitively impaired minority sample.</td>
<td>Concurrent validity was supported with correlations ranging from 0.56 to 0.90. The lowest correlations were found between the FPS-R and the other scales, suggesting that the FPS-R may be measuring a broader construct incorporating pain.</td>
<td>In terms of pain scale preference, the NRS (33%) was the preferred scale in the cognitively intact group and the FPS-R (54%) was the preferred scale in the cognitively impaired group. African-Americans and Hispanics preferred the FPS-R. Severely, moderately, and mildly impaired participants also preferred the FPS-R. The NRS, FPS, VPS, and VDS were appropriate pain rating scales for the participants in this study, and that the VAS should be used in combination with one of these scales.</td>
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<td>Yazici et al. 2014. [27]</td>
<td>621 postoperative adult patients</td>
<td>B</td>
<td>L</td>
<td>To determine patient pain scale preferences and compare the level of agreement among pain scales commonly used during postoperative pain assessment.</td>
<td>Patient preference for pain scales were as follows: 97.4% FPS, 88.6% NRS, 84.1% VDS, 78.1% TPS, 60.1% SFMPQ, 37.0% BPI, 11.4% VAS, and 10.5% MPQ. Education was an important factor in the preferences for all scales (p &lt; .000). The level of pain determined by the VAS did not correlate with the level of pain identified by the NRS, TPS, FPS, and VDS (p &lt; .05).</td>
<td>In terms of pain scale preference, the NRS (33%) was the preferred scale in the cognitively intact group and the FPS-R (54%) was the preferred scale in the cognitively impaired group. African-Americans and Hispanics preferred the FPS-R. Severely, moderately, and mildly impaired participants also preferred the FPS-R. The NRS, FPS, VPS, and VDS were appropriate pain rating scales for the participants in this study, and that the VAS should be used in combination with one of these scales.</td>
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<tr>
<td>Bahreini M et al. 2015. [30]</td>
<td>150 adult ED patients</td>
<td>C</td>
<td>H</td>
<td>To access the agreement between VAS, Color Analog Scale (CAS), and NRS in the emergency setting.</td>
<td>The three pain scales were strongly correlated at all time periods. The findings suggest that NRS, CAS, and VAS can be interchangeably applied for acute pain measurement in adult patients.</td>
<td>Spearman correlation coefficients between NRS and CAS, NRS and VAS, and CAS and VAS were 0.95, 0.94, and 0.94, respectively (p &lt; 0.001). On a scale of 0 to 10, the 95% limits of agreement between the paired NRS and VAS, VAS and CAS, and CAS and NRS ranged from −2.0 to 2.6, from −2.7 to 2.0, and from −2.1 to 2.0, respectively. Using a valid tool for pain assessment gives the clinician an objective criterion for pain management. Due to the subjective nature of pain, consideration of socio-cultural factors for the particular context ensures that</td>
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<tr>
<td>Azlito L et al. 2015. [11]</td>
<td>150 post-operative patients</td>
<td>B</td>
<td>L</td>
<td>To select, develop, and validate context-appropriate unidimensional pain scales for pain assessment among adult post-operative patients.</td>
<td>(Color-Circle Pain Scale–[CCPS]) had higher scale preference than NRS and FPS. Convergent validity was very good and significant (0.70–0.75). Inter-rater reliability was high (0.923–0.928) and all the scales were convergent valid and a similar metric between the scales.</td>
<td>Using a valid tool for pain assessment gives the clinician an objective criterion for pain management. Due to the subjective nature of pain, consideration of socio-cultural factors for the particular context ensures that</td>
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<tr>
<td>Gőransson KE, et al. 2015. [32].</td>
<td>217 adult ED patients</td>
<td>B</td>
<td>L</td>
<td>To compare correlations between values on the VAS and the NRS in patients in the ED and to assess the patients’ preference of scale</td>
<td>sensitive to change in the intensity or level of pain experienced before and after analgesia. The pain scores generated from the NRS and the VAS were found to strongly correlate (mean difference, 0.41). Most patients found the NRS easier to use than the VAS (61% and 22%, respectively; p &lt; .001). The sample reported moderate amounts of pain on average. Examination of the IRT location parameters for the pain intensity items indicated the following approximate correspondence: VDS mild ≈ NRS 1–4, VDS moderate ≈ NRS 5–7, VDS severe ≈ NRS 8–9, and VDS very severe, horrible ≈ NRS 10. There was moderate agreement between calculated percentage pain reduction from a VAS or NRS and patient-reported % pain reduction in patients having epidural analgesia. The difference could range up to 30%. Psychometric analyses suggested that the NRS was the preferred pain intensity scale. The VDS also had a favourable profile with low error rates and good face, convergent and criterion validity.</td>
<td>A majority reported that the NRS reflected/described their pain better than the VAS (53% and 26%, respectively; p &lt; .01). NRS might be more appropriate to use in the ED than the VAS. Either scale (VDS and NRS) can be used in practice depending on the preference of the clinician and respondent.</td>
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<td>Edelen MO, et al. 2010. [33].</td>
<td>1960 elderly residents from 71 nursing homes</td>
<td>B</td>
<td>L</td>
<td>To compare VDS and NRS using item response theory (IRT) methods to identify the correspondence between the scales response options by estimating item parameters for these and five additional pain items.</td>
<td>The concordance correlation coefficient with patient-reported percentage pain reduction was 0.76 and 0.77 for the VAS and NRS, respectively. Difficulties with VAS use among the elderly were identified, including high rates of unscorable data and low face validity.</td>
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<td>Pratici E, et al. 2017. [34]</td>
<td>97 women in labor</td>
<td>C</td>
<td>H</td>
<td>To determine the level of agreement between calculated percentage pain reduction, derived from VAS or NRS, and patient-reported % pain reduction in patients having epidural analgesia.</td>
<td>The verbally administered NRS can be substituted for the VAS in acute pain measurement.</td>
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<tr>
<td>Gagliese L, et al. 2005. [35]</td>
<td>504 postoperative adults.</td>
<td>B</td>
<td>L</td>
<td>To compare the feasibility and validity of the NRS, VDS, and VAS (horizontal and vertical line orientation) for the assessment of pain intensity in younger and older surgical patients.</td>
<td>All five pain scales were sensitive in detecting changes in pain intensity pre and post joint injection. All correlations between the scales were strong and significant; however, the intercorrelations for the older cohort were weaker. The scale most preferred in both cohorts of patients was the IPT, followed by the VDS. When asked about scale preference, both the cognitively impaired and the intact groups preferred the IPT and the VDS. This study revealed that cognitive impairment did not inhibit participants’ ability to use a variety of pain intensity scales, but the stability issue must be considered.</td>
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<tr>
<td>Bijur PE, et al. 2003. [36]</td>
<td>108 adult ED patients</td>
<td>C</td>
<td>H</td>
<td>To assess the comparability of the NRS and VAS as measures of acute pain, and to identify the minimum clinically significant difference in pain that could be detected on the NRS.</td>
<td>The verbally administered NRS can be substituted for the VAS in acute pain measurement.</td>
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<tr>
<td>Herr K, et al. 2007. [37]</td>
<td>97 adults with chronic joint pain</td>
<td>B</td>
<td>L</td>
<td>To compare the sensitivity and utility of the new IPT with four other pain scales: NRS, VNS, FPS, and VAS, using a naturally occurring pain condition and a controlled treatment with rheumatology patients.</td>
<td>All five pain scales were sensitive in detecting changes in pain intensity pre and post joint injection. All correlations between the scales were strong and significant; however, the intercorrelations for the older cohort were weaker. The scale most preferred in both cohorts of patients was the IPT, followed by the VDS. When asked about scale preference, both the cognitively impaired and the intact groups preferred the IPT and the VDS. This study revealed that cognitive impairment did not inhibit participants’ ability to use a variety of pain intensity scales, but the stability issue must be considered.</td>
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<tr>
<td>Taylor LJ, et al. 2005. [38]</td>
<td>66 cognitively impaired elderly</td>
<td>B</td>
<td>L</td>
<td>To determine the reliability and validity of selected painintensity scales such as the FPS, VDS, NRS, and the Iowa Pain Thermometer (IPT) to assess pain in cognitively impaired older adults.</td>
<td>The verbally administered NRS can be substituted for the VAS in acute pain measurement.</td>
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<tr>
<td>Li L, et al. 2007. [39]</td>
<td>173 postoperative adults.</td>
<td>B</td>
<td>U</td>
<td>To determine the psychometric properties and applicability of four pain scales in Chinese postoperative adults.</td>
<td>Although all four scales can be options for Chinese adults to report pain intensity, the FPS-R appears to be the best one. No significant differences were noted in terms of gender, age, and educational level.</td>
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<tr>
<td>Li L, et al. 2009. [40]</td>
<td>180 postoperative elderly.</td>
<td>B</td>
<td>U</td>
<td>To evaluate the reliability and validity of the FPS-R, NRS, and the Iowa Pain Thermometer (IPT) for pain assessment in Chinese elders who have had hip joint replacement surgery.</td>
<td>Although all three scales show good reliability, validity, and sensitivity for assessing postoperative pain intensity in Chinese elders, the IPT appears to be the appropriate tool used.</td>
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</table>
The use of pain-rating scales is not as straightforward as it might first appear. The bulk of evidence published to date has demonstrated a gap for pain; either method should be used interchangeably to assess acute pain. Reports focus that although all pain-rating scales are consistent.

In the present study, most of the studies in the analysis indicated a good correlation between VAS, VRS/VDS, and NRS, although some pointed out there is a discrepancy in some situations. One study reported a moderate agreement between calculated percentage pain reduction from a VAS or NRS and the difference could range up to 30%.

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5. Discussion

In order to use pain-rating scales well clinicians need to appreciate the potential for error within the tools, and the potential they have to provide the required information. Interpretation of the data from a pain-rating scale is not as straightforward as it might first appear. Leigheb M, et al. pointed out that there is substantial discordance between NRS and VAS scores which is suggestive of a need for clinical judgment to be incorporated into assessment of actual pain intensity and concluded that leaning on pain scale data alone is not a comprehensive approach [23].

In the present study, most of the studies in the analysis indicated a good correlation between VAS, VRS/VDS, and NRS, although some pointed out there is a discrepancy in some situations. One study reported a moderate agreement between calculated percentage pain reduction from a VAS or NRS and the difference could range up to 30%.

VAS and NRS were also found to have strong correlation and can be used in practice depending on the preference. The elderly were found to have a better choice based on patient preference.

One of the first reviews on comparison of the three pain scales (VAS, VRS, and NRS) were published by Williamson and Hoggart in 2005 and they reported that all three scales were valid, reliable, and appropriate for use, although the VAS had more practical difficulties than the other two scales [28]. They stressed that for general purposes the NRS has good sensitivity and produces data that can be analysed for audit purposes. Likewise, Hjermstad MJ, et al. performed a systematic review of studies to culminate data on the use and performance of unidimensional pain scales [29]. They reported that when compared with the VAS and VRS, NRSs had better compliance in 15 of 19 studies reporting this, and were the recommended tool in 11 studies. Overall, NRS and VAS scores corresponded, with a few exceptions of systematically higher VAS scores.

Limitations of this article are similar to all review articles: the dependence on previously published research and availability of references. There is also a lack of published Level I and Level II studies specific to this topic in the world's literature.

6. Summary and conclusion

“Pain cannot be treated if it cannot be assessed”. The most important principle is that clinicians should somehow assess their patients’ pain levels, no matter which method or scale one uses to accomplish this task. Special scales developed and validated for patients with difficulties in communication should be made available, and ED physicians should have a plan for assessing pain in different case scenarios.

The bulk of evidence published to date have demonstrated a gap for improvement to indicate pluses and minuses of each rating scale used for acute pain. Reports focus that although all pain-rating scales are
valid, reliable and appropriate for use in emergency setting, theVAS has somewhat appeared more difficult than the others. Elderly patients and those with cognitive impairment, communication problems and minorities have found verbal descriptor or rating scales more practical than others in expression of their pain intensity. Ongoing research in the area of ED patient pain management along with usability of each tool should be conducted on specific patient groups and populations before firm conclusions could be drawn.

References


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