Congruence of pain assessment between nurses and emergency department patients: A replication

Martin Duignan MSc, BSc, HDip (Emergency Nursing), Dip (Management) (Advanced Nurse Practitioner Candidate) *, Virginia Dunn MSc, BSc (Nursing) (Former Lecturer, Trinity College Dublin)

Emergency Department, Our Lady’s Hospital, Navan, Co. Meath, Ireland

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Pain assessment; Clinical significance; Emergency department

Abstract
Aim: To ascertain congruence between patients’ self-report of pain intensity and nurses’ assessment of their pain intensity.
Methods: This study adopted a replication methodology which aimed to ascertain congruence between patients’ self-report of pain intensity and nurses’ assessment of their pain intensity. Raw statistical data was analysed using SPSS for windows.
Results: This study supports the findings of the original US study that emergency nurses frequently underestimate patients’ pain intensity. However, this study also found incidents where nurses accurately assessed their patients’ pain intensity, and incidences of overestimation.
Conclusions: This study illustrates underestimation of patients’ pain intensity by emergency nurses which is both clinically and statistically significant.
Relevance to clinical practice: Implications for nursing practice include a need for assessment of patients’ pain intensity, the development of pain management protocols, and increased emphasis on education in both undergraduate and postgraduate nursing curricula. Also there needs to be continued clinical audit of pain management standards.

Introduction
Since the seminal 1973 publication of Marks and Sachar’s paper which examined the prevalence of drug seeking behaviour among medical inpatients there has been persistent debate regarding the inadequate treatment of patients’ pain in hospital environments (Marks and Sachar, 1973; Ducharme and Barber, 1995; Puntillo et al., 2003; Nelson et al., 2004).

Oligoanalgesia, that is, the inadequate prescribing of analgesia for patients in pain, remains common among ED patients despite initiatives such
as the publication of the Joint Commission of Accreditation of Health Care Organizations, JCAHO (2000) pain standards, (Ducharme, 1994; Alexander and Manno, 2003; Fosnocht et al., 2003; Todd, 2004; Godwin et al., 2005).

Internationally the assessment of patients’ pain has been identified as a pivotal area for pain management by the US Joint Commission on Accreditation of Healthcare Organisations (2000). Similarly, it has been asserted that excellence in pain assessment is crucial to pain management yet it has been identified that studies which compare clinicians’ assessments with patients’ actual pain ratings frequently confirm that clinicians underestimate the patient’s level of pain (Gunnarsdottir et al., 2003).

In an article focusing on the standards set by the JCAHO on standards for pain management, Curtiss (2001) identified the most powerful predictor of poor pain management was a discrepancy between the patient’s perception of pain and that of the clinician. Further evidence of the discrepancy between nurses’ perceptions of pain, and the patient’s level of pain can be found in Puntillo et al. (2003), who researched congruence between emergency nurses’ assessment of their patients’ pain intensity and patients’ self-report. Puntillo et al. (2003) study involved a total of 156 patients and 37 nurses. It assessed patients’ pain intensity both at triage and in the clinical area, and in both areas poor levels of assessment were noted. Concordance between nurses’ and patients’ pain intensity was 50% or less, i.e. where nurses’ pain intensity scores were within one point of the patients’ using a horizontal 0–10 numeric rating scale.

Oligoanalgesia may exist because of a misconception regarding who is the authority on a patient’s pain (Hunter, 2000). Pasero and McCaffery (2001), assert that because pain cannot be proved or disproved, the patients’ report of pain should be accepted as the gold standard, even over patient behaviour and vital signs. In support of this view the AGS Panel on Persistent Pain in Older Adults (2002) has identified patients’ self-reports of pain intensity as the most accurate and reliable evidence of pain presence and intensity.

This study was conducted to assess the congruence between nurses’ assessment of their patient’s pain intensity and patients’ self-report. It was motivated by the dearth of Irish or European literature on this subject and a concern by the researchers that failure to address the issue of underestimation of pain by emergency nurses would result in this practice continuing. Ethical approval was obtained both from the hospital’s ethics committee and the ethics board of Trinity College Dublin.

Research design

Aim

To determine congruence between assessment of pain intensity by nurses in Irish emergency departments when compared with patient assessment of pain.

Method

Following consideration the researchers felt that approximate replication was an appropriate methodology for this study. Replication is defined as the deliberate repetition of research procedures in a second investigation for the purpose of determining if earlier results can be repeated (Polit et al., 2001; Burns and Grove, 2005). Approximate replication involves repeating the original study using the original methods as closely as possible, however it may involve different subjects and different experimenters (Heffner, 2004). As a research method it is essential to the construction and continued development of any discipline (Connelly, 1986; Fahs et al., 2003).

A search for appropriate research papers was performed using the databases of Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, MD consult, and relevant library texts. The most appropriate paper identified was by Puntillo et al. (2003), who researched congruence between emergency nurses’ assessment of their patient’s pain intensity and patients’ self-report, whose methodology has been described earlier.

The methodology adopted for this study was a descriptive cross-sectional study of a purposive non-probability sample of emergency department patients who presented to the department with a primary complaint of pain, and a convenience sample of emergency nurses. Patient’s were observed once in this current context, and not followed up longitudinally. Upon presentation to the department the patient was asked to rate their pain intensity using a horizontal 0–10 numeric rating scale (NRS) and the nurse who reviewed the patient was also asked to rate the patient’s pain intensity using the same numeric rating scale following an initial assessment. The emergency nurse did not have access to the patient’s self-assessment of pain intensity.
Sample

The sample population was obtained by employing inclusion and exclusion criteria. These inclusion and exclusion criteria are similar to those used by Puntillo et al. (2003) (although to obtain ethical approval for this study prisoners and young offenders had to be excluded). In Puntillo et al. (2003), the study included an approximate 4:1 patient to nurse ratio (156 patients and 37 nurses). This study aimed to replicate this ratio and, as 16 emergency nurses worked in the ED, the study recruited 64 patients.

Inclusion criteria

Patients who were eligible to participate were:

1. Adults over 18 years.
2. Patients who did not have a life or limb threatening condition (i.e. Manchester Triage categories one or two, which are defined as patients who necessitate immediate intervention and should be seen by a doctor within 10 min).
3. Patients who were able to use the numeric rating scale as determined by the triage nurse.

Nurses who were eligible to participate were:

1. Emergency nurses including clinical nurse managers working in the ED.

Exclusion criteria

Patients who were excluded from participation were:

1. Patients who had a life or limb threatening condition (i.e. Manchester Triage categories one or two).
2. Those who were unable to use the NRS due to communication difficulties, mental illness, learning disability or dementia.
3. Prisoners or young offenders (mandated by ethics committee).

Furthermore as there is no way of eliminating potential bias with convenience sampling (Brink and Wood, 2001), the researcher introduced objectivity, so that the researcher did not deliberately select subjects. This was achieved by appointing a gatekeeper between the researcher and patient participants who informed patients about the study and invited them to speak to the researcher if they were interested in participating.

Results

The mean patient pain intensity rating (while at rest) was found to be 6.4, while the mean nurse assessment of patients’ pain intensity at rest was 5.2. The parametric analysis technique used to determine significant differences between patients’ and nurses’ estimation of pain intensity was t test for independent samples. The $t$ test found that nurses’ estimation of patients’ pain significantly differed ($t = -3.046$, d.f. 126, $p = 0.003$).

Although nurses were found to have underestimated patients’ pain in the majority of cases, this was not exclusive. Some congruence occurred between the pain intensity scores of patients and emergency nurses, and there are incidents of over-estimation of pain intensity by emergency nurses as demonstrated in Fig. 1 (Boxplot). This figure illustrates that while the mean differences demonstrated underestimation, there was agreement in some instances in pain intensity ratings between patients’ and emergency nurses (at 0.00). The box itself contains the middle 50% of the data, the upper edge of the box indicating the 75th percentile of the data set and the lower edge indicating the 25th percentile. This figure clearly indicates that the majority of nurses underestimated patients pain intensity (where patients pain is 0.00). The ends of the vertical lines indicate the minimum and maximum data values, and a number of outliers are also seen on this figure.

Clinical significance of pain intensity scores

As it is recognised that statistical significance is not synonymous with clinical significance (Chu, 1999),

![Boxplot indicating difference in pain intensity ratings.](image-url)
both nurse and patient pain scores were recoded in SPSS 12. This was undertaken to reflect the pain categories on which, Serlin et al. (1995) established, clinicians base their treatment decisions. On a 0–10 NRS these categories are 1–4 mild pain, 5–6 moderate pain and 7–10 severe pain.

In just over half of cases emergency nurses estimated their patients’ pain intensity in the same category as patients themselves \((n = 35, 54.7\%)\). However, this means that in a large number of incidents nurses estimated their patients’ pain in a different category \((n = 29, 45.3\%)\). Of those nurses who estimated patients’ pain to a different category the majority \((n = 26, 89.6\%)\) placed their patient in a lower pain category, underestimating patients’ pain by one category.

The majority of nurses who did estimate their patients’ pain intensity to a different category did so by one category \((n = 28, 95.5\%)\). Only one nurse underestimated their patient’s pain by two categories. Therefore, as almost half of the sample underestimated their patients’ pain by at least one category it can be concluded that a clinically significant difference exists between patients’ estimation of their pain intensity and nurses’ estimation of patients’ pain intensity.

**Factors accounting for observed differences**

To determine possible causes for the difference between patients’ self-report of pain intensity and nurses’ assessment of the patients’ pain intensity a number of factors were examined. The variables associated with the emergency nurses themselves were initially examined using scatter-plots to identify visual correlation patterns and then examined using Pearson’s correlation coefficient (Table 1).

<table>
<thead>
<tr>
<th>Variables</th>
<th>R value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>–0.214</td>
<td>0.089</td>
</tr>
<tr>
<td>Gender</td>
<td>0.87</td>
<td>0.495</td>
</tr>
<tr>
<td>Experience in emergency nursing</td>
<td>0.117</td>
<td>0.355</td>
</tr>
<tr>
<td>Number of professional qualifications</td>
<td>–0.227</td>
<td>0.355</td>
</tr>
<tr>
<td>Level of academic Award</td>
<td>0.032</td>
<td>0.799</td>
</tr>
<tr>
<td>Qualification in emergency nursing</td>
<td>–0.041</td>
<td>0.750</td>
</tr>
<tr>
<td>Previous attendance at pain management course</td>
<td>–0.041</td>
<td>0.97</td>
</tr>
<tr>
<td>Current nursing grade</td>
<td>–0.125</td>
<td>0.325</td>
</tr>
</tbody>
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Application of Pearson’s correlation found no significant correlation between difference in pain scores and any of the variables tested. These variables included age, gender, experience in ED nursing, number and level of professional qualifications, previous attendance at a pain management course and current nursing grade. Differences in pain intensity ratings were also examined based on the patient’s chief complaint (see Fig. 2). The greatest underestimation in pain intensity ratings between patients and nurses were noted for abdominal pain, musculoskeletal pain and cellulitis. Overestimation of pain intensity by one emergency nurse in a patient with a painful throat was also found.

**Discussion**

It is well documented in the literature that pain is the most common reason for presentation to emergency departments (Illingworth and Simpson, 1994; Tanabe and Buschmann, 2000; Ducharme, 2005). Despite the issue of oligoanalgesia being initially highlighted 18 years ago by Wilson and Pendleton (1989) studies illustrate that the issue of undertreating pain in emergency departments continues to exist.

The mean patient pain intensity score in this study was found to be 6.45 (SD 2.1). This pain intensity rating is slightly less than the mean patient pain intensity scores presented by Puntillo et al. (2003) who found mean intensity ratings of
7.5 (SD 2.2) in the triage area and 7.7 (SD 2.2) in the clinical area. Nurses in this Irish study estimated their patients’ average pain intensity as 5.2 (SD 2.55), which is similar to the findings of Puntillo et al. (2003) who found nurses’ mean score as 5.1 (2.4) in the triage area and 4.2 (SD 2.3) in the clinical area. Both patients’ pain intensity ratings and nurses’ estimation of patients’ pain intensity are indicative of moderate pain in this study, while in the Puntillo et al. (2003) study patients’ mean pain was estimated as severe, while nurses estimated patients’ pain to be moderate (Serlin et al., 1995). In the current study, differences in patients’ and nurses’ pain intensity ratings were found to be statistically significant at \( p = 0.003 \) which is in agreement with Puntillo et al. (2003) who found the difference in pain intensity ratings to be statistically significant at \( p < 0.001 \).

More important than statistical significance is the issue of clinical significance (Chu, 1999). Clinical significance is especially important in this study as the literature indicates that clinicians use categorical pain severity classifications to make important treatment decisions (Jensen et al., 2001) and that an appreciation of pain severity is the crucial first step towards successful pain management (Serlin et al., 1995). In this study 45% of nurses estimated their patient’s pain into a different category, with 90% of those underestimating their patients’ pain. Only three patients’ pain were overestimated into a different category representing less than 5% of the population sampled.

A number of reasons were explored to explain the differences in pain intensity estimations. One possible reason, which was explored, was the nurses’ characteristics. Variables such as nurse’s age, gender, ED experience, number and level of professional qualifications, grade and previous attendance at a pain management course were all examined. None of the variables tested were found to be correlated with differences in pain intensity ratings. This is an interesting finding especially with regard to those variables, which are education based. There has been considerable debate in the literature regarding whether education results in a change of behaviour. Twycross (2002) demonstrated in an observational study that education about pain did not result in a behaviour change while conversely Tanabe and Buschmann (2000), who surveyed 305 emergency nurses using a 52 item questionnaire, found that nurses who had attended a one day pain seminar had significantly better knowledge regarding pain management. This position is supported by Bernardi et al. (2007) who surveyed 66 hospice nurses using ‘The Nurses Knowledge and Attitudes Survey’ and found higher mean correct answer scores from those nurses who had attended courses on pain education. Nurses in this study who had previously attended a pain management study day did not estimate patients’ pain intensity significantly better.

Another possible contributory factor, which was examined to see if it could explain the mis-estimation of patients’ pain, was the patients’ presenting complaint. The greatest overestimation was found in a patient with a painful throat, although this is an outlier and needs to be treated cautiously. The greatest underestimation of pain intensity ratings occurred with abdominal pain and musculoskeletal injuries. This is similar to the findings of Puntillo et al. (2003) who found the greatest mean difference occurred with musculoskeletal pain followed by abdominal pain. The least mean difference in this study was found in those patients who sustained a fracture dislocation. This was also a low ranking category in Puntillo et al. (2003) and may be because of the visible nature of the injury.

Conclusion

This research study demonstrates that universal adequate pain management remains an elusive goal within the emergency nursing setting. It has been demonstrated in the literature that under treatment of pain in the ED setting can result in detrimental outcomes for patients. It is envisioned that this study can contribute to the body of knowledge informing practitioners in the clinical setting and assist in narrowing the gap that exists between the ideal of universal effective pain management and the reality of clinical practice. The study focused on determining congruence between emergency nurses and patients in assessment of patients’ pain, and the findings support those of the original study by Puntillo et al. (2003) that considerable underestimation of patients’ pain occurs in the emergency department. It is hoped that this study will strengthen the findings of Puntillo et al. (2003), and strengthen the existing body of nursing knowledge.

References


