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The association of depression and neuroticism with pain reports: A comparison of momentary and recalled pain assessment

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Abstract

Objective: Pain assessment has been shown to be affected by depression, neuroticism, and recall bias. The purpose of this study was to determine whether momentary pain assessment, compared with recalled pain reports, would diminish the influence of neuroticism and depression on the measurement of pain. **Methods:** Patients with chronic pain (n=66) completed depression (Beck Depression Inventory II) and neuroticism (NEO Personality Inventory) questionnaires, made weekly recall pain ratings, judged their change in pain from 1 week to the next over a 4-week period, and collected momentary reports of pain intensity and pain unpleasantness over a 2-week period. **Results:** Analyses showed that neuroticism and depression correlated with pain intensity and pain unpleasantness at low levels for both momentary and recalled pain reports. Neuroticism and depression did not influence the accuracy of recalled pain (difference between momentary and recalled data). Both neuroticism and depression were systematically associated with ratings of judged change in pain even when actual changes in pain were controlled. Specifically, for increased levels of baseline depression and neuroticism, patients displayed a pattern of judging recent pain as more severe than pain in the previous week following several weeks of symptom monitoring. **Conclusion:** There was little evidence for neuroticism and depression affecting either recall or momentary pain ratings or influencing the accuracy of recall ratings. However, neuroticism and depression did influence pain assessment when the task involved rating change in pain—a measure widely used in clinical research.

Keywords: Ecological Momentary Assessment; Recalled pain assessment; Pain intensity; Global impression of change; Neuroticism; Depression

Introduction

The potential impact of psychological factors on pain measurement is important in pain assessment. Several studies have shown that systematic recall bias influences the recall of pain [1–3], and common psychological factors, such as neuroticism and depression, have been identified as favoring the recall of negative information [4–7]. The primary goal of this study was to determine whether new approaches, such as momentary assessment, can diminish the influence of neuroticism and depression on the measurement of pain.

In clinical practice, patients with chronic pain are routinely asked to give retrospective information about their pain. Using this information, clinicians make important decisions, such as diagnosis, treatment, and evaluation of treatment efficacy [2,8]. Autobiographical memory research finds that recalling pain is an active reconstruction process in which recalled information is transformed and distorted by memory and summarization processes [1–3]. Some claim that people's memory is fairly accurate [9], but most assert that the retrieval and interpretation of painful episodes are potentially biased [2,10,11]. The use of the global impression of change in pain is also widespread in clinical practice

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and trials [12]. Evaluating change in pain over a period of time is a complex cognitive task and, as such, may also be vulnerable to the influence of biasing factors.

Research in affect and cognition suggests that neuroticism and depression exert an effect on memory [4–7]. People with high levels of neuroticism are considered to have a general tendency to experience negative affect (such as fear, sadness, and embarrassment) and to report more somatic complaints [13,14]. Compared to control subjects, depressed patients tend to recall more unhappy memories [4], take longer to respond to positive cues than to negative ones, and are less specific in their memories, especially in response to positive cues [5]. Consequently, patients with elevated levels of neuroticism and depression may recall the negative experience of pain in ways that distort measurement. In addition, qualitative differences between depressed pain patients and other depressed groups were found. Compared to depressed controls and nondepressed pain patients, depressed pain patients recall fewer depression-related words but more ill-health words (e.g., suffering and dependent) [15], show bias towards negative self-description and biased processing of negative illness-related information [16], and report more cognitive distortion in pain-related situations [17]. This suggests that chronic pain may trigger an affective response that is more related to pain experience than it is related to depression. Pincus et al. [18] suggest that simultaneous pain and depression are associated with different biases in the content of recall material.

Several studies have documented relationships between neuroticism and depression and reports of pain in patients with chronic pain [19–26]. Neuroticism has been found to be related to pain unpleasantness (an affective dimension of pain) but not to pain intensity [19–22]. In cross-sectional studies, the impact of major depression on ratings of chronic pain reported a small correlation between depression and pain intensity, and a moderate correlation between depression and pain unpleasantness [22–26]. Until now, the influence of neuroticism and depression on pain dimensions has only been examined using approaches based on cross-sectional studies or end-of-day diaries that still entail some degree of recall.

An alternative approach to dealing with assessment recall bias has been to move to momentary assessment strategies, as they eliminate the retrospective nature of self-reports [1]. This strategy uses an intensive diary sampling method and asks patients to report their pain several times throughout the day, known as Ecological Momentary Assessment (EMA) [1] and Experience Sampling Method [27]. It is postulated that momentary assessment not only reduces recall bias but may also reduce the effects of psychological factors such as neuroticism and depressed mood, thus yielding a measurement of pain that is less contaminated [20]. In this paper, we examine the relative influence of neuroticism and depression on momentary and recall assessments of pain dimensions. By eliminating recall in momentary assessment, it is expected that pain reports will be less influenced by neuroticism and depression, compared with conventional recall measures of pain. Collection of EMA ratings also allows for a computation of the accuracy of recall ratings and judged change in pain. This permits an examination of the relationship between levels of neuroticism and depression and the accuracy of recall reporting.

To summarize, the present study aims to: (a) compare the association of neuroticism and depression with momentary pain versus recalled pain; (b) analyze how neuroticism and depression correlate with the accuracy of recalled pain reports; and (c) examine the relationship of neuroticism and depression with patients' judgment of change in pain from 1 week to the next. First, we hypothesize that there will be a higher correlation of neuroticism or depression with recalled pain than aggregated EMA reports of pain. Second, we hypothesize that higher levels of neuroticism and depression will be associated with less accuracy in recalled pain (defined as the difference between recalled pain and momentary pain for the same week). Third, we expect that high levels of neuroticism and depression will influence the judgment of change in pain. Specifically, we hypothesize that patients with high levels of neuroticism and depression will report that current pain is worse than prior pain.

Methods

Participants

Participants were patients with chronic pain (fibromyalgia, rheumatoid arthritis, osteoarthritis, and ankylosing spondylitis) who were recruited from a northeastern community in the United States. The research review board of the Stony Brook University approved the protocol. Compensation of US$100 was provided to patients for participation.

Inclusion criteria were as follows: age of 18–80 years; absence of sight or hearing problems; fluency in English; absence of difficulty holding a pen and writing; pain of ≥6 months, ≥3 days/week, ≥3 h/day, with an average pain level of ≥4 (on a rating scale of 0–10); absence of serious psychiatric impairment; and absence of alcohol or drug problems. Of 175 candidates who were eligible, 121 (69%) agreed to participate, and 95 (54%) came to the laboratory to participate. This investigation is a secondary analysis of a larger study [28] and reports on 69 patients, a subset of the 95, who engaged in pain assessments involving both electronic diaries (EDs) and traditional recall questions required for the present study. Of the 69 participants, three were removed from analyses. One person generated little data due to loss of ED after Visit 2, and two participants' diary compliance rates were below acceptable levels (63% and 77%; group average compliance was 94%), reducing the final sample to 66.

The average age of the 66 participants was 51.0 years (S.D.=10.6; range, 25–75 years), and most were female (85%), married (68%), and White (94%). Comorbidities are