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Clinical Study

# Waddell non-organic signs: new evidence suggests somatic amplification among outpatient chronic pain patients

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**Abstract**

**BACKGROUND CONTEXT:** Waddell et al. identified a set of eight non-organic signs in 1980. There has been controversy about their meaning, particularly with respect to their use as validity indicators.

**PURPOSE:** The current study examined the Waddell signs in relation to measures of somatic amplification or over-reporting in a sample of outpatient chronic pain patients. We examined the degree to which these signs were associated with measures of over-reporting.

**STUDY DESIGN/SETTING:** This study examined scores on the Waddell signs in relation to over-reporting indicators in an outpatient chronic pain sample.

**PATIENT SAMPLE:** We examined 230 chronic pain patients treated at a multidisciplinary pain clinic. The majority of these patients presented with primary back or spinal injuries.

**OUTCOME MEASURES:** The outcome measures used in the study were Waddell signs, Modified Somatic Perception Questionnaire, Pain Disability Index, and the Minnesota Multiphasic Personality Inventory-2 Restructured Form.

**METHODS:** We examined Waddell signs using multivariate analysis of variance (MANOVA) and analysis of variance (ANOVA), receiver operating characteristic analysis, classification accuracy, and relative risk ratios.

**RESULTS:** Multivariate analysis of variance and ANOVA showed a significant association between Waddell signs and somatic amplification. Classification analyses showed increased odds of somatic amplification at a Waddell score of 2 or 3.

**CONCLUSIONS:** Our results found significant evidence of an association between Waddell signs and somatic over-reporting. Elevated scores on the Waddell signs (particularly scores higher than 2 and 3) were associated with increased odds of exhibiting somatic over-reporting. 

*Keywords:* MMPI-2-RF; Non-organic signs; Somatic exaggeration; Somatic malingering; Waddell signs; Somatic feigning; Response bias

## Introduction

In 1980, Waddell et al. [1] developed a systematic collection of eight physical signs (widely referred to as *Waddell signs*) thought to measure non-organic subjective pain complaints centered around the lower back and extremities. These signs, reflective of pain complaints, did not have an organic etiology and were originally proposed to objectively predict

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whether a patient would be a successful back surgery candidate. Waddell et al. proposed that the signs might reduce lengthy and costly referrals for psychological testing, which is sometimes used to identify poor surgical candidacy [1]. Fishbain et al. [2] reviewed 61 studies involving the Waddell signs and summarized the literature at the time. The authors found consistent evidence that the non-organic signs demonstrated acceptable inter-rater reliability, were associated with poorer surgical treatment outcomes, and predicted prolonged non-return to work.

The utility of Waddell signs as indicators of symptom feigning has been debated since their introduction, and some have pointed out that the signs are abused by physicians to discredit the validity of patients' complaints [3]. Fishbain et al. [4] concluded that Waddell signs were not representative of secondary gain and malingering because they were not consistently associated with medicolegal or workers' compensation status and improved with treatment. Fishbain et al. found mixed results as to whether Waddell scores were related to physicians' perception of dishonesty. Fishbain et al. also discussed three studies that found no association between Waddell signs and Minnesota Multiphasic Personality Inventory (MMPI)/ Minnesota Multiphasic Personality Inventory-2 (MMPI-2) validity scales, thus supporting their claim that the signs were not representative of symptom over-reporting [1,5,6]. However, the three studies that examined the Waddell and MMPI/ MMPI-2 validity scales limited their investigation to the three original validity indicators on the test: L, F, and K. Two of these scales (L and K) are measures of under-reporting and would therefore not be expected to show any significant association with Waddell signs. The F scale of the MMPI and MMPI-2 measures feigned psychopathology and, as such, would be unlikely to capture over-reporting of somatic and pain symptoms [7,8].

The current study examined the Waddell signs in a sample of chronic pain patients treated at an outpatient multidisciplinary clinic. The majority of these patients had external incentives in the form of disability involvement and seeking narcotic pain medication, which is another secondary gain issue common in this type of setting. Scores on the Waddell signs were compared with various self-report indicators of over-reporting (both somatic and psychological symptoms), as well as systematic assessment of psychological, somatic, and pain variables. We hypothesized that individuals receiving higher scores on the Waddell signs would show evidence of somatic and pain over-reporting. We examined Waddell scores in relation to the latest version of the MMPI, the Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI-2-RF) [9], which includes two validity scales specifically designed to assess non-credible somatic complaints, the Infrequent Somatic Responses (Fs) and Symptom Validity (FBS-r) scales, as well as two brief self-report measures of somatic and pain perception, the Modified Somatic Perception Questionnaire (MSPQ) [10] and the Pain Disability Index (PDI) [11], both of which have been shown to be effective in capturing amplification of somatic symptoms and pain [12–14].

## Method

### *Participants*

The current study used data from 230 chronic pain patients treated at a multidisciplinary pain clinic in Kentucky. The sample was predominantly women (57%), with a mean age of 49.6 years (SD=14.2) and a mean education of 12.7 years (SD=2.1), and predominantly Caucasian (96%), with 3% African American and the remaining 1% of other ethnicities. Each patient self-reported their current pain across eight sites on a scale from 0 (no pain) to 10 (extremely painful). The mean pain rating was 4.00 (SD=2.17), with the highest individual site averages for lower back pain ($M$=6.53, SD=3.35) and leg pain ($M$=5.17, SD=3.41). See Table 1 for injury and symptom characteristics of the entire sample. The majority of the sample (72%) was unemployed at the time of the evaluation and slightly less than half (49%) were currently receiving disability benefits, although a majority of the sample (61%) had applied for disability benefits at some point in their lives. Litigation status was not known. Thus, the majority of patients in this sample had some form of financial incentive.

EVIDENCE & METHODS

**Context**
Waddell's signs have been used as a screening utility for the detection of non-organic pain generation and amplification since they were first described more than 30 years ago. The authors sought to evaluate the correlation between documented Waddell's clinical signs and somatic amplification or over-reporting in a chronic pain population.

**Contribution**
This study included 230 patients. In this analysis, Waddell's signs were associated with increased likelihood of somatic over-reporting.

**Implications**
The results of this study reinforce the importance of Waddell's signs as markers of non-organic pain generation. The reader should be aware that the sample itself may represent the potential for some confounding as the group under study is likely not representative of the general population as a whole. These findings rightly should not be extrapolated beyond other chronic pain patients with characteristics similar to those considered for inclusion by the authors. Given the design of this study, the authors appropriately recognize that it presents Level III evidence; however, this solely remains within the clinical context of the chronic pain population considered in this work.