

Development, validity, and reliability of The Assessment of Pain and Occupational Performance (POP): a new instrument using two dimensions in the investigation of disability in back pain

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Abstract

BACKGROUND CONTENT: Questionnaires for measuring the functional status of patients with low back pain (LBP) focus on disability and present responses for each question in a predetermined, fixed relationship between “can do/difficulties and pain.” Their design does not permit a separation of the two.

PURPOSE: To present the development of The Assessment of Pain and Occupational Performance (POP) and to evaluate validity and reliability.

STUDY DESIGN: A prospective, consecutive study of patients investigated by use of the POP.

PATIENT SAMPLE: A total of 220 patients participated in the study.

METHODS: In a cross-sectional study including 53 patients with chronic musculoskeletal pain, empirical tests of content and construct validity established the definitive version of the POP. The POP focuses on performance of activities. It is a disease-specific, discriminative assessment instrument designed for patients with back pain (BP) and LBP. Based on a semi-structured interview the POP investigates each of 36 activities in two dimensions, with separate, defined scales from “normally healthy” to “extremes” for level of activity (x-scale) and pain intensity (y-scale). The final scores are expressed in percent, 0% to 100%. Patients with chronic LBP (CLBP) (n=142) were allocated to the specific (S) group, that is, patients with specific LBP problems (n=97) or to the nonspecific (NS) group, that is, those with NS BP (n=45). The ability of the POP to differentiate between the two known groups was evaluated. Construct–convergent validity between the POP and the Oswestry Disability Index (ODI) was carried out for the S group. Inter-rater reliability was established between six pairs of raters who examined 25 patients recruited from primary health care, the P-LBP group.

RESULTS: In construct known group validity, the median, the interquartile range, and the Mann-Whitney *U* test showed that the S group had a significantly higher level of activity ($p < .001$) combined with worse pain ($p = .001$) compared with the NS group. There were significant differences between the two groups in performing activities in the forward bending position (10 items) and in the upright standing position (9 items). The result of Spearman rank order correlation showed a strong relationship between the ODI and the POP for level of activity ($r = 0.70$, $p \leq .001$). The multiple correlation coefficient between the total score of the ODI (10 items) and the total score of the POP (36 items) was $r = 0.72$ and $p \leq .001$. Inter-rater reliability—the standard deviation of the differences was less than 1 point (scale 0–5). A Bland–Altman plot showed the mean differences for the level of activity of the dressing/undressing item. The average percentage agreement was 80% on the x- and y-scales. In POP 36, the average Kappa for level of activity was 0.79, which is good agreement, and for pain 0.84, which is very good agreement.

FDA device/drug status: not applicable.

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CONCLUSION: The construction of the POP allows the patient to count, and the occupational therapist to investigate, from full level of activity to avoidance and from no pain to worst imaginable pain for each physically loaded task in personal activities of daily living (ADL), transfer/transport, instrumental ADL, and social activities. The POP can differentiate between groups concerning level of activity and pain, and appears to be a valid and reliable instrument for evaluating LBP. The POP should be considered for use in both clinical and research applications. © 2009 Elsevier Inc. All rights reserved.

Keywords: Back pain; Impairment; Activity limitation; Activities of daily living; Assessment; Outcome; Reliability; Validity; Occupational therapy

Introduction

In cases of back pain (BP) enduring for more than 4 weeks, it is important for the caregiver to assess specific factors from a multidimensional perspective [1–3]. Both clinical practice and research suggest that data should be organized according to the International Classification of Functioning, Disability and Health, which integrates health condition and levels of body structures or functions, personal activities, and participation in society with influences of personal and environmental factors. From that health perspective, the dimension of disability should be evaluated in terms of activity [4,5]. The Canadian model of occupational performance describes the term “occupational performance” as the product of the interactions between the person (eg, physical, cognitive, and affective factors), his/her environment (eg, institutional, social, and so forth) and the occupation (eg, self-care, productivity, and leisure) being performed [6]. A panel of experts has recommended outcome assessments for standardizing the assessment and evaluation of spinal disorders [7,8]. The assessment should consist of traditional clinical variables, from the doctor’s physical examination in relation to laboratory imaging methods. The “core set” of outcome questionnaires includes back-specific function, generic health status, pain, work disability, and patient satisfaction [9]. How is the information from these questionnaires to be used, and how can specific factors of importance be identified and weighted in multidimensional low BP (LBP)?

Waddell stresses the need for discriminative methods in the clinical assessment of a patient, “we are still very bad at dealing with disability... and to solve the problems in simple backache” [10]. A disease-specific assessment instrument for investigating personal activities should have items and responses that are systematically created to identify pain and factors of importance to performance [11–14]. In diagnosing LBP, several investigators have proposed a distinction between LBP and disability, separating pain and performance of activities [15–18]. Which instrument has accomplished that in practice? Methods available for each item are based on a fixed relationship between pain and activity and do not permit the separation of the two. This can be illustrated by an example from the most thoroughly researched instrument designed for assessing

disability in LBP, the Oswestry Disability Index (ODI), section 2, “It is painful to look after myself and I am slow and careful” [19–21]. This is an assessment of pain and disability at the same time.

A threefold specification of requirements was formulated—the instrument should evaluate the patients “doing” (ie, performance wording) not “can” or is “difficult to do” (ie, capacity wording); the task should constitute a certain activity for detecting the specific physical load on the spine or leg; and the activity/item should be answered in two dimensions, that is, level of activity and pain.

A literature search was conducted of articles on assessment instruments published between 1980 and 1997 in the Medline and Cinahl databases with combinations of four mesh terms—outcome, assessment, BP, activity of daily living (ADL), and the key word, occupational therapy. The result showed more than 75 instruments in the domains of disability and pain [12–14,18,19,22–30]. We did not find any assessment instrument that alone or in combination with others satisfied these predetermined requirements. The purpose of this study is to present the development of The Assessment of Pain and Occupational Performance (POP) and to evaluate the validity and reliability of the POP.

Methods

Subjects

The studies are based on a total of 220 patients (Table 1).

The empirical content and construct validity were tested in a cross-sectional study that included 53 consecutive patients with work-preventing chronic musculoskeletal pain (CMP). They were recruited from the outpatient rehabilitation unit at the spine clinic of a University hospital in Sweden. There were 34 women and 19 men, whose average age was 43.4 years. Of these, 17% had BP, 36% had LBP with leg pain, and 47% had both neck/shoulder pain and LBP with or without pain in the legs or arms.

A total of 142 patients referred for surgeons’ second opinions by general practitioners in the regions around Östergötland County, Sweden, were investigated for chronic LBP (CLBP). Patients were referred to determine whether

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