Technical Report

Factor analyses for the Örebro Musculoskeletal Pain Questionnaire for working and nonworking patients with chronic low back pain

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Abstract

BACKGROUND CONTEXT: The Örebro Musculoskeletal Pain Questionnaire (ÖMPQ) has good psychometric properties to predict return to work in patients with acute low back pain. Although it is used in patients with chronic back pain and nonworkers, there is no evidence on the factor structure of the ÖMPQ in these populations. This is deemed an important prerequisite for future prediction studies.

PURPOSE: This study aimed to analyze the factor structure of the ÖMPQ in working and nonworking patients with chronic back pain.

STUDY DESIGN/SETTING: This is a cross-sectional study in a university-based spine center.

PATIENT SAMPLE: The patient sample consists two cohorts of working and nonworking adult patients (>18 years) with specific and nonspecific chronic back pain.

OUTCOME MEASURES: The Örebro Musculoskeletal Pain Questionnaire.

METHODS: Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed in working (N=557) and nonworking (N=266) patients for three, four, five, and six factors identified in literature. A goodness of fit index was calculated by a chi-square. Root mean square error of approximation (RMSEA) was calculated, and the number of factors identified was based on RMSEA values <.05. A Tucker-Lewis index (TLI) and a normed fit index (NFI) >0.90 are considered to indicate acceptable fit.

RESULTS: In working patients, a five-factor solution had the best fit (RMSEA<0.05; NFI and TLI >0.90), but substantial adaptations should be made to get proper fit (removal of the work-related items). In nonworking patients, a four-factor analysis had the best fit (RMSEA<0.05). For both samples, items related to duration could not fit in the overall model.

CONCLUSIONS: Factor structure of the ÖMPQ was not confirmed in working and nonworking patients with chronic back pain. Substantial adaptations should be made to obtain a factor structure with acceptable fit.   © 2016 Published by Elsevier Inc.

Introduction

Prediction of chronic pain in patients with acute low back pain is known to be mediated by various biopsychosocial factors [1]. As such, several questionnaires have been constructed as tools to predict and identify patients who are at risk for chronic back pain (CBP). Examples include the STarT Back Screening Tool [2] or the Örebro Musculoskeletal Pain Questionnaire (ÖMPQ) [3]. For the population of patients who already have CBP, in which it is known that complex phenomena such as central sensitization or comorbidity may appear, a number of prognostic factors for recovery were identified including personal, health, social factors, work status [4,5], and psychological factors [6]. For prediction of recovery in patients with CBP, the ÖMPQ or the STarT Back Screening Tool have no proven additional value, but good alternatives appear nonexistent. In a recent focus article, the National Institutes of Health task force on research standards for chronic low back pain composed a minimal dataset to close this gap and validated this on construct validity and responsiveness [7]. First results indicate a better responsiveness than the Roland Morris Disability Questionnaire but the cutoff points for an impact stratification scale, which was defined by pain intensity, pain interference, and physical function, were not studied and stated as relatively arbitrary [7]. Currently, it is insufficiently clear how to predict recovery in patients with CBP by a screening list and which underlying constructs appear to be of importance.

The ÖMPQ covers many of the factors predicting recovery in patients with CBP identified in previous studies and may therefore be an appropriate questionnaire to identify patients at risk for non-recovery. The predictive validity and reliability was reported as sufficient for clinical use in patients with acute and subacute back pain [3,8]. Additionally, a few studies reported on a subsample of patients with chronic pain [8–11], but only in the study of Grotle et al. the chronic pain subgroup was reported on as an individual group [11]. Consequently in that study, the outcome of interest for that subgroup shifted toward prediction of (non-)recovery, which was different from the objective for which the ÖMPQ was intended for (prediction of chronic pain).

Despite proven sufficient psychometric qualities of the ÖMPQ for the (sub)acute population, there are controversies on the outcome of interest [12]. Additionally, there appears to be an inconsistency in the factor structure. In the original study, the questionnaire was constructed from four questionnaires, grouped into five factors, which were used for discriminant analyses. These five factors concerned daily activities, coping with pain, fear-avoidance beliefs, likelihood of recovery, and miscellaneous [3]. In another study, a three-factor structure was found [11]. In two other studies, a six-factor structure was found in a slightly adapted version of the ÖMPQ [9,10]. One of the hypothesized differences between these studies may also be the difference in sample characteristics: patients with acute and chronic pain, and workers and nonworkers. Originally, the ÖMPQ was constructed to predict work status [13], but the ÖMPQ is less responsive on outcomes pain and disability [12]. Thus, the predictive validity depends on the outcome of interest, and to be able to make logically sound predictions, the outcome of interest should be related to the underlying response sets of the questionnaire [14]. Additionally, for nonworking samples including students, housewives, or retired patients, the ÖMPQ will have a considerable amount of nonrelevant items because of the inclusion of work-related items. In previous research, it was stated that all work-related items could be replaced by the mean of the item score [13], but it is unclear how this affects the factor structure and if removal of these work-related items leads to reliable results. Consequently, there is insufficient evidence about the factor structure in working and nonworking patients with CBP. The factor structure, a part of structural validity [15], should therefore be studied in the chronic and nonworking population before it can be used in prediction studies.

The objective of this study is to investigate the factor structure separately for a working and a nonworking patient sample with a wide range of CBP admitted to a multispecialist university-based spine center. In the latter sample, factor structure will be evaluated after removal of work-related items.

Materials and methods

Procedures

Patients with CBP, who were assigned to the Groningen Spine Center in The Netherlands, were included in this study. Patients were selected from a larger database and