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HEALTH SERVICES RESEARCH

Development of a Short Form of the Örebro Musculoskeletal Pain Screening Questionnaire

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Study Design. A longitudinal design where the questionnaire was completed at a pretest and predictive ability evaluated with a 1-year follow-up. A second sample was employed to provide a replication.

Objective. The aim of the study was to validate a short form of the Örebro Musculoskeletal Pain Screening Questionnaire (ÖMSPQ).

Summary of Background Data. Several studies demonstrate the research and clinical utility of the ÖMSPQ. Calls have been made for a shorter form that requires less time in administering.

Methods. The short version was constructed by taking two items from each of the five factors shown to have predictive power. It was then tested against the long form in two samples of people with musculoskeletal pain where one reflects an occupational health care population (N = 324) and the other a primary care population (N = 183) thus providing a built-in replication. All participants completed the ÖMSPQ and were then followed over the course of a year to evaluate disability as measured by sick leave.

Results. The correlation between the short and long forms was 0.91. The receiver operating characteristic curve was nearly identical for the long and short versions of the questionnaire (*e.g.*, primary care sample: 0.84 *vs.* 0.81; occupational sample: 0.72 *vs.* 0.70). Of those who developed disability, a cutoff of 50 on the short version identified 85% in the occupational and 83% in the primary care samples which was nearly as good as the full version.

Conclusion. The short form of the ÖMSPQ is appropriate for clinical and research purposes, since it is nearly as accurate as the longer version.

Key words: back pain, early identification, Örebro Musculoskeletal Pain Screening Questionnaire, prediction of disability, psychological factors, screening. **Spine 2011;36:1891–1895**

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Because musculoskeletal pain (*e.g.*, back pain) may develop into a disabling persistent problem, it is important to identify those patients at risk as early as possible. Indeed, back pain remains a very significant problem given the large number of sufferers and the fact that about 10% seeking care for acute problems will develop long-term work disability.[1,2] Among the known risk factors are a host of psychosocial variables, sometimes called "yellow flags,"[3–7] that are clearly related to future disability. However, even though many guidelines recommend assessing and identifying these yellow flags, this is not always achieved in the clinic as clinicians lack the tools and often the confidence to do so.[8]

The Örebro Musculoskeletal Pain Screening Questionnaire (ÖMSPQ) was developed as a tool to assist in the early identification of yellow flags and patients risking the development of work disability due to the pain.[9,10] The ÖMSPQ has 25 items of which 21 are scored and it has satisfactory psychometric properties and predictive ability.[11,12] However, the purpose is to screen in to identify those in need of further assessment rather than to do a full assessment.[13,14] Calls have therefore been made for tools with the greatest clinical utility, that is , being short and easy to administer.[15–17].

The purpose of this article is consequently to report on the development and validation of a short version of the ÖMPSQ.

MATERIALS AND METHODS

Overview of the Design

A short form was constructed and then compared with the full-length version to determine its utility for identifying patients with psychological risk factors. To strengthen generality and provide a replication, two independent samples were employed where one reflects an occupational survey recruitment procedure and the other a primary care setting. Both samples have prospective outcome data for analyzing predictive ability.

Participants

We selected two independent populations from the Center for Health and Medical Psychology screening database so that a replication could be performed. The first population (occupational sample) includes 324 volunteers and it is an amalgamation of participants in two outcome studies previously described in the literature.[18,19] Although the inclusion criteria for the two studies were slightly different, all participants were of working age (18–60 years old) and they fulfilled the criteria of suffering from musculoskeletal back pain, having less than 3 months of sick leave, having no determined red flags, and who completed the questionnaires and had complete outcome sick leave information available. Recruitment mirrored an occupational situation, since it included workers and was achieved *via* general surveys (17: advertisement in local newspapers; 18: a random selection of community residence) where those fulfilling the above listed criteria were invited to participate. Sixty-seven percent of the sample was female and the average age of the participants was 44.7 (SD = 7.7). The second independent sample reflected a primary care setting (primary care sample) since recruitment was conducted in conjunction with primary care where sufferers were actively seeking intervention; the population is described in more detail in the clinical trial publication.[20] The inclusion criteria were as follows: (1) employed; (2) 20 to 60 years of age; (3) report of nonspecific back or neck pain; (3) less than 4 months of sick leave during the past year for spinal pain; and (4) no physical therapy during the past year. Exclusion criteria were red flags, for example, disc disease or the lack of fluency in Swedish. In all, 183 patients completed the study and had follow-up data available. The average age was 48 years old, 83% of the patients were female.

The above research protocols were approved by Örebro University Hospital's Ethics Committee.

Procedure

The short version was created by selecting items from the full version with the aim of reducing it to a one-page, 10-item instrument that nevertheless might have good predictive ability. Because previous research with psychological instruments shows that having two items per concept provides sufficient validity,[21] we used the same procedure. The areas to be included were selected on the basis of two sources of information. First, factor analysis indicates that the ÖMPSQ has six basic factors.[22] However, one factor (coping) has low predictive ability and therefore was not included. Hence, the authors selected two items, on the basis of consensus, from each of the five remaining factors: self-perceived function, pain experience, distress, fear-avoidance beliefs, and return to work expectancy. The selected items are shown in Table 1. Participants rate the items on 0 to 10 point scales anchored by extremes, for example, "no pain—pain as bad as it could be" or "completely disagree—completely agree." The item on duration however, has 10 categories ranging from 0 to 1 week to more than 52 weeks. Two items are reversed as indicated in Table 1 and ratings are then summed to obtain a score between 1 and 100 where higher scores indicate higher estimated risk for future work disability. Questionnaires were completed at baseline as part of the assessment procedure in the studies. Data for the short form were extracted from the full version, as participants completed the full version only. Sick leave during the follow-up year was used as the outcome.

TABLE 1. The Items Selected for the Short Version of the ÖMPSQ

	Item	Concept Area	Scoring*
1	How long have you had your current pain problem?	Pain	1–10
2	How would you rate the pain that you have had during the past week?	Pain	0–10
3	Please circle the one number that best describes your current ability to participate in each of these activities I can do light work for an hour.	Self-perceived-function	0–10, reversed scoring
4	Please circle the one number that best describes your current ability to participate in each of these activities I can sleep at night.	Self-perceived function	0–10, reversed scoring
5	How tense or anxious have you felt in the past week?	Distress	0–10
6	How much have you been bothered by feeling depressed in the past week?	Distress	0–10
7	In your view, how large is the risk that your current pain may become persistent?	Return to work expectancy	0–10
8	In your estimation, what are the chances you will be working your normal duties in 3 mo	Return to work expectancy	0–10, reversed scoring
9	An increase in pain is an indication that I should stop what I'm doing until the pain decreases.	Fear avoidance beliefs	0–10
10	I should not do my normal work with my present pain	Fear avoidance beliefs	0–10

**Higher scores indicate higher levels of estimated risk for developing pain related disability. Scores may range from 1 to 100.*

ÖMPSQ, Örebro musculoskeletal pain screening questionnaire.

DATA ANALYSIS

The data are based on extracting the short version from the full version and then comparing it to the full version completed at the pretreatment assessment. This was subsequently submitted to analyses with regard to sick leave at the follow-up approximately 1 year later. We defined poor outcome as more than 14 days off work during the past 6 months. Statistical analyses were performed using MedCalc for Windows, version 11.2.0.0 (MedCalc Software, Mariakerke, Belgium).

RESULTS

The zero-order correlation between raw scores from both versions of the ÖMPSQ was quite high (r[407] = 0.91,

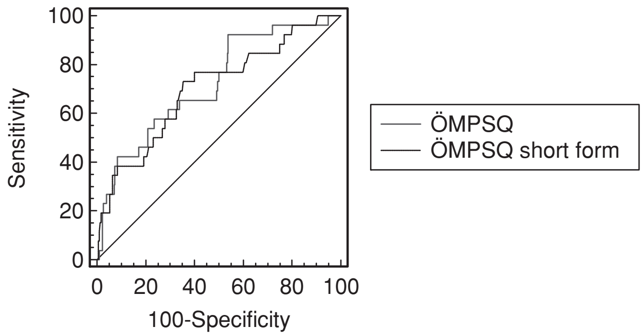

Figure 1. Receiver operating characteristic (ROC), occupational sample.

$P < 0.001$). This correlation indicates that the questions on the short form corresponded well with the information obtained on the long form. Below the area under the curve for both measures predicting sick leave in each sample is reported on.

Study 1: Occupational Sample

Figure 1 illustrates that the receiver operating characteristic curve (area under the curve) was 0.72 (95% CI = 0.67–0.77) and 0.70 (95% CI = 0.65–0.75) for the long and short forms, respectively. There was no significant difference between the areas ($P = 0.46$). Interval likelihood ratios for scores on both versions of the ÖMPSQ predicting more than 14 days accumulated sick leave were calculated for both samples and are shown in Tables 2 and 3 for the short and long forms, respectively. The tables present the number of participants having a score in intervals of 10 points on the scale and their long-term outcome where "positive" refers to developing a problem and "negative" to not developing such long-term sick leave. Thus, it illustrates how many cases would be identified if a given interval score were used as the cut-off. As may be observed in the tables, most cases of long-term sick leave would be identified with a cut-off score of 90 on the long version and 50 on the short version, as 24 of 26 of those developing a poor outcome would be identified with the long form (92%) and 22 of 26 (85%) using the short version.

Study 2: Primary Care Sample

The finding from study 1 was replicated in a second sample with even more area under the curve. Figure 2 graphically depicts the results for the long and short form, respectively. As can be seen, the area under the curve was 0.84 (95% CI = 0.78–0.89) and 0.81 (95% CI = 0.74–0.86). There was no significant difference between the areas ($P = 0.38$). As described above, the interval likelihood ratios for scores on both versions of the ÖMPSQ predicting more than 14 days accumulated sick leave show that most cases would be identified with a cut-off score of 90 on the long version and 50 on the short version. Specifically, 10 of 12 cases (83%) developing a poor outcome would be identified with the long as well as the short form.

TABLE 2. Interval Likelihood Ratios for Scores on the ÖMPSQ (Long Form) Predicting More Than 14 Days Accumulated Sick Leave

	Occupational Sample				Primary Care Sample			
Interval	Positive	Negative	Likelihood Ratio	95% CI	Positive	Negative	Likelihood Ratio	95% CI
0–50	0	9	0.000	0.000–10.677	0	11	0.000	0.000–10.368
51–60	1	21	0.546	0.0764–3.897	0	23	0.000	0.000–4.798
61–70	0	19	0.000	0.000–4.859	1	23	0.620	0.0913–4.204
71–80	1	41	0.280	0.0401–1.951	1	29	0.491	0.0731–3.304
81–90	0	44	0.000	0.000–2.055	0	26	0.000	0.000–4.229
91–100	7	55	1.459	0.741–2.870	1	25	0.570	0.0843–3.854
101–110	5	49	1.170	0.511–2.678	0	14	0.000	0.000–8.037
111–120	1	21	0.546	0.0764–3.897	4	9	6.333	2.279–17.600
121–130	4	20	2.292	0.847–6.206	2	6	4.750	1.071–21.065
131–140	6	12	5.731	2.343–14.015	0	4	0.000	0.000–31.768
141–150	1	5	2.292	0.278–18.895	1	1	14.250	0.949–214.029
151–170	0	2	0.000	0.000–61.912	2	0	∞	2.718–∞
Total	26	298			12	171		

The table shows the number of people having a score within each given interval distributed by "positive," that is, developing a long-term problem, and "negative," that is, not developing long-term sick leave. A score of more than 90 would "miss" two actual cases in both samples but correctly identify the majority of cases (24 in the occupational and 10 in the primary care sample).

CI, confidence interval; ÖMPSQ, Örebro musculoskeletal pain screening questionnaire.

TABLE 3. Interval Likelihood Ratios for Scores on the ÖMPSQ Short Form Predicting More Than 14 Days Accumulated Sick Leave

	Occupational Sample				Primary Care Sample			
Interval	Positive	Negative	Likelihood Ratio	95% CI	Positive	Negative	Likelihood Ratio	95% CI
0–10	0	0	∞	0–∞	0	2	0.000	0.000–74.718
11–20	0	3	0.000	0.000–37.123	0	4	0.000	0.000–31.768
21–30	0	24	0.000	0.000–3.817	1	31	0.460	0.0685–3.084
31–40	4	49	0.936	0.367–2.388	1	48	0.297	0.0448–1.969
41–50	2	84	0.273	0.0712–1.046	1	51	0.279	0.0422–1.851
51–60	10	81	1.415	0.841–2.381	4	22	2.591	1.064–6.310
61–70	5	48	1.194	0.521–2.736	2	11	2.591	0.646–10.385
71–80	5	8	7.163	2.524–20.328	2	2	14.250	2.195–92.510
81–90	0	1	0.000	0.000–166.822	1	0	∞	1.006–∞
91–100	0	0	∞	0–∞	0	0	∞	0–∞
Total	26	298			12	171		

The table shows the number of people having a score within each given interval distributed by "positive," that is, developing a long-term problem, and "negative," that is, not developing long-term sick leave.

CI, confidence interval; ÖMPSQ, Örebro musculoskeletal pain screening questionnaire.

DISCUSSION

The findings from this study suggest that the short version of the ÖMPSQ can be justified as an early screening tool for use in primary care settings. The short version predicts nearly as well as the original version, but can be completed more rapidly and is easier to score. Consequently, the short ÖMPSQ (ÖMPSQ-short) is appropriate for screening and epidemiological studies.

The results of this study are in line with some other recent investigations. First, a study in Australia employed a similar shortened version of the ÖMPSQ administered within the first 48 hours of injury and obtained participation from nearly 100% of the injured workers. Results showed that those with high scores subsequently cost nearly four times as much for their injury as those with low scores, mainly due to delayed return to work.[23] Second, data from an epidemiological study in Belgium has identified the exact same five factors as the best variables for predicting future disability.[24] Third, another short tool designed to help general practice physicians make decisions has been compared to the ÖMPSQ.[17] This cross-sectional study indicates that both tools are clinically viable. However, the ÖMPSQ focuses more on work and the prediction of work disability, since this is a gold standard outcome of considerable importance to the patient as well as to society. Epidemiological studies suggest that many patients will return to work even though they continue to have some pain and disability.[25] And, when we used the short ÖMPSQ to predict pain or function the predictive utility was not as high as for work disability.

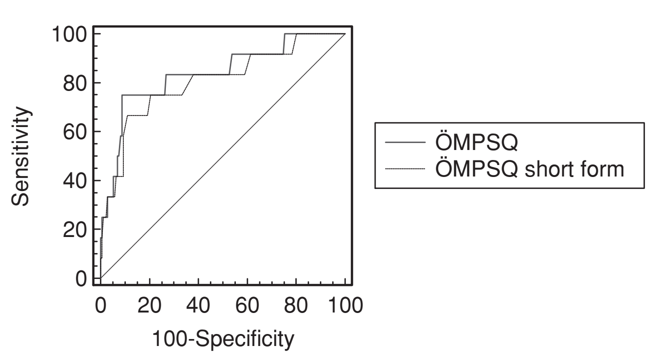

Figure 2. Receiver operating characteristic (ROC), primary care sample.

The predictive ability of the short ÖMPSQ was better in the clinical, primary care setting, as compared to the data from participants from the general public who were actively recruited for an intervention. This may reflect the fact that it is more difficult to predict outcome before the individual has decided to seek care. In the primary care sample the short form produced a sensitivity of 0.75, which was exactly the same as the long version, while specificity was nearly as good (short: 0.78) as the long version (0.84).

Although a short version of the ÖMPSQ has several logistical advantages, some aspects may be compromised. Not only would the longer version be expected to have somewhat better psychometrical properties, but it also may be more useful clinically. The questionnaire has been recommended to serve as a guide for discussing the situation with the patient,[9,13] and the short version has less information. Moreover, the idea behind early screening is to identify those possibly in need of further assessment or intervention. The danger is that it is instead used merely to classify patients, resulting in the loss of much of its value. For example, clinicians may choose to simply examine the score without discussing results with the patient or using the information to form hypotheses about what might best be done such as having a more detailed assessment.

Our study has certain limitations. First, the participants completed only the full version and therefore it is not known how completing only the short version might affect responses. Given the results noted above from a study in Australia, and our clinical experience, we suspect that the differences would be small. Second, we do not know how well our results would generalize to other populations, for example, older participants or the unemployed, or those in other countries and settings. Finally, we do not have information about the clinical acceptability of the scale. However, our experience with the full version suggests acceptability and that clinicians and patients alike may welcome the short version.

Future research with new samples will be needed to replicate these results and determine the clinical utility of this short version. Our results suggest that the short version should have good predictive ability in primary care settings.

➢ Key Points

- ❑ The short form of the ÖMPSQ is almost as accurate as the long version but it takes less time to complete and score.
- ❑ Using a short version may compromise validity and the clinical utility of the instrument since less information is available.
- ❑ The short form has sufficient predictive ability for use in clinical and research situations.

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