Psychological distress and somatisation as prognostic factors in patients with musculoskeletal illness in general practice

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SUMMARY
Background. Musculoskeletal illness is a common cause of absenteeism from work, workers’ compensation, and disability retirement, and accounts for 9.3% to 17% of patient contacts in general practice. To understand the increase in self-reported musculoskeletal illness and to improve treatment and prevention, it is important to know which factors to target when dealing with these patients.

Aim. To investigate whether the prognosis for patients with musculoskeletal illness referred to physiotherapy from general practice can be predicted by the presence of psychological distress and somatisation identified by a general practitioner (GP) and standard questionnaires.

Method. A multi-practice survey based on questionnaires (index and three-month follow-up). Nine hundred and five consecutive patients referred to physiotherapy from 124 different general practices in Denmark were included. Outcome measures were physical health change, sick leave, patient self-rated improvement, and change in use of medication.

Results. Psychological distress and somatisation rated by both GPs and standard questionnaires acted with almost no exception as significant predictors of all four outcome measures.

Conclusion. Psychological distress and somatisation are important factors when considering preventive initiatives and treatment of patients with musculoskeletal illness in general practice.

Keywords: musculoskeletal pain; work; mental health; somatisation.

Introduction
Musculoskeletal illness is a common cause of absenteeism from work, workers’ compensation, and disability retirement,1,2 and accounts for 9.3% to 17% of all patient contacts in general practice.3,4 The prevalence has been increasing over recent years.3,4,7 The first patient questionnaire (PQ1) was given to the patient by the GP upon inclusion in the study and returned to the research unit in a prepaid-postage envelope. It contained standard questionnaires measuring psychological distress (SCL-8),5 hypochondriacal beliefs (Whiteley-7),6 and general health status (SF-36), as well as information about use of medication for musculoskeletal illness and sociodemographic characteristics.

A three-month follow-up questionnaire was mailed to all responders of PQ1. It included the standard questionnaires and information about absenteeism from work, use of medication for musculoskeletal illness (daily, not daily, not at all), and patient-perceived improvement in musculoskeletal illness during the three-month follow-up period.

Predictor variables
The predictor variables were based on the following four measures:

1. Minor but clinically relevant or more severe psychiatric disorder identified by the GP at index visit (GPpsych+), i.e. psychiatric disorder needing specific attention in the GP’s opinion.

2. Psychological distress measured by SCL-8 at index visit (score $\geq 3 = $ SCL8+). SCL-8 is a well validated, shortened version of the Hopkins Symptom Check List (SCL-90),16,18,19 A score of three or more yields a detection sensitivity of 0.51 of probable psychiatric disorder according to a standardised psychiatric interview, a specificity of 0.88, and a positive predictive value of 0.66 (unpublished results).

3. Somatisation identified by the GP at index visit. If the GP noted that the patient’s illness was either poorly defined or psychiatric with somatic symptoms, it was counted as GP-identified somatisation (GPsom+).

4. Somatisation according to Whiteley-7 (score $\geq 3 = $ Whi7+) at index visit. Whiteley-7 is a well validated, seven-item shortened version of the Whiteley Index on hypochondriasis.17,20,21 Using a cut-point between two and three yields a detection sensitivity of at least one ICD-10 somatoform disorder of 0.43, a specificity of 0.95, and a positive predictive value of 0.71.17

One main predictor variable was the four possible combinations of GPpsych and SCL-8 (Tables 1 to 4). The other main predictor variable was the four possible combinations of GPsom and Whi-7 (Tables 1 to 4). The reason for making combined variables was to avoid problems of collinearity in the logistic regression model.22

The four outcome measures that were investigated were:

1. Physical health change measured by change in SF-36 physical component score (PCS).23,24 SF-36 is a reliable and valid measure of general health in different populations.25-29 A reliable change index (RCI) was calculated.30 RCI is a standardised measure of change taking into account the reliability of the scale. Change in RCI was dichotomised into ‘statistically significant increase’ (RCI $\geq 1.96$) and ‘no change or a statistically significant decrease’ (RCI $< 1.96$).

2. Patient-reported sick leave between index visit and three-month follow-up (yes/no).

3. Change in the use of medication for musculoskeletal illness dichotomised into ‘reduced or no use’ and ‘increased or unchanged use’.

4. Patient self-rated improvement in the musculoskeletal illness dichotomised into ‘improvement’ (‘substantial improvement’ or ‘some improvement’) and ‘no improvement’ (‘no improvement’ or ‘marginal improvement’).

Even though it may compromise the sensitivity of measurement, the variables were dichotomised, as this eases interpretation considerably.

**Statistical analysis**

First, the data were analysed by obtaining contingency tables and estimating odds ratios for the four outcome variables depending on the two main predictors. We adjusted for age group (ten-year groups), sex, diagnostic group (well defined/poorly defined), and chronicity (chronic or acute) by entering the variables as indicator terms in a logistic regression model.31 Adjusted odds ratios are based on the full model. As for the outcome ‘sick leave’, the analysis included only patients in the workforce and patients on unemployment or social benefit (584 of the 905 patients). Logistic regression models were also fitted separately for men and women and for well and poorly defined diagnoses.

Differences between these subgroups are stated explicitly in the text. Odds ratios are reported with 95% confidence intervals.

**Results**

A total of 144 GPs participated, representing 124 (46%) different practices in the county. Participating GPs tended to have been in general practice for a shorter time, have fewer patients listed, and have fewer contacts with physiotherapists concerning the treatment of individual patients than non-participating GPs. Statistically, participating and non-participating GPs did not differ significantly in terms of sex, type of practice (single-handed/partnership), localisation (rural/city/mixed), number of GPs in the practice, and self-reported knowledge and experience in the fields of rheumatology, physiotherapy, and psychiatry (data not shown).

During the one year, 1720 patients were included. A total of 1092 (63%) answered PQ1, and 905 (83% [53% of the included 1720 patients]) answered the follow-up. The analysis was performed solely on patients for whom all questionnaires were answered. There was no difference in distribution of GP-rated diagnoses and illness chronicity, psychological distress, and somatisation between patients responding and patients not responding to PQ1 (data not shown). However, more women (70%) than men (60%) responded, and the median age of responders was 47 years compared with 45 years for non-responders. Among responders in the follow-up there was a tendency towards less distressed patients (SCL+ = 16% [range = 13% to 18%]) and fewer somatisers (Whi+ = 15% [range = 13% to 18%]) compared with non-responders (SCL+ = 22% [range = 16% to 28%], Whi+ = 20% [range = 14% to 26%]). However, there were no significant differences for the remaining variables investigated. The follow-up response rate for women was 84% and for men 81%. Median age of responders was 48 years compared with 39 years for non-responders.

**Prediction of physical health**

Psychological distress was predictive of lack of improvement in physical health (Table 1), especially psychological distress identified by the GP. SCL-8 contributed little to the prediction and then only if the GP also had identified psychological distress. The predictive value of GP+/SCL+ seemed higher for women (OR = 4.6 [95% CI = 1.5 to 13]) than for men (OR = 3.0 [95% CI = 0.5 to 15]). Somatisation was not predictive of a negative outcome.

**Prediction of sick leave**

Psychological distress was predictive of sick leave too. The GP and SCL8 had approximately the same odds ratio for prediction. However, for the GP the confidence interval included one (Table 2). When analysing data on men alone, the odds ratio for the combination GPpsych+/SCL8+ was the same as for women but for the combination GPpsych-/SCL8+, the odds ratio was 6.5 (95% CI = 1.7 to 23.9) for men and 1.3 (95% CI = 0.6 to 2.6) for women. Somatisation was predictive of sick leave but only statistically significant when identified by Whiteley-7.

**Prediction of use of medication**

Psychological distress, whether identified by the GP or SCL-8, was not predictive of an increased or unchanged use of medication after three months (Table 3). However, for men alone the odds ratio for the combination GPpsych+/SCL8+ was 2.85 (95% CI = 0.8 to 10), whereas it was 0.9 (95% CI = 0.4 to 1.9) for women alone. Somatisation was predictive of a negative outcome.
but only statistically significant when identified by Whiteley-7.

**Prediction of patient self-rated improvement**

Psychological distress was predictive of ‘no or little improvement’ in musculoskeletal illness (Table 4). GP- and SCL-8-identified psychological distress seemed to be equally important predictors. For women the odds ratio for GPpsych+/SCL8+ was 3.5 (95% CI = 1.6–9.2) and 1.6 (95% CI = 0.7–3.2) for men. Somatisation, especially when identified by Whiteley-7, was a stronger predictor of a negative outcome.

**Discussion**

Psychological distress and somatisation, with almost no exceptions, were predictive of four different *a priori* defined outcomes in patients referred to physiotherapy with musculoskeletal illness. The odds ratios ranged up to 3.8, which was comparable with those found by Roland *et al* who studying predictors for outcome of low back episodes in general practice. Cherkin *et al* found depression to be predictive of outcome for back pain with an odds ratio of approximately two. The most remarkable finding of the present study was that psychological distress identified at the index visit not only predicted sick leave and self-rated improvement in illness but also the PCS after three months. The
fact that somatisation has no predictive value for physical outcome, but for all other outcomes, could possibly be explained by the fact that Whiteley-7, and to some extent GPsom, measures ‘illness worry’, which would be expected to be more predictive of the patients’ illness behaviour and perception (staying home from work, taking medication, and not feeling improvement) than of physical health.

In the case of psychological distress, the GP and SCL-8 seemed relatively equal in their ability to predict outcome. As for somatisation, Whiteley-7 was generally superior to the GP. This could be a result of our definition of GPsom, which was based on asking whether the GP would characterise the patient’s illness as poorly defined or as psychiatric illness with physical symptoms. The questionnaires could add information to the GPs’ ratings as a predictor of outcome in patients with musculoskeletal illness.

The study has some important limitations; for example, only half of the practices in the county participated. However, it seems that GPs’ decision to participate was not related to a special interest in musculoskeletal illness but rather to an interest in, and general willingness to contribute to, research (i.e. younger GPs, training practices, and less busy [smaller] practices). Generally, patients have the same GP for a long time (often for life), and the choice of GP will usually not depend on the GP’s special interests. Hence it is unlikely that the participating GPs have a selected population of patients with musculoskeletal illness.

We do not know whether all patients referred to physiotherapy were included but have reason to believe that most of them were, as the standard referral formulas had a reminder about the study printed on them. However, not all included patients returned the PQ1; but those who did return it differed only slightly in parameters from those who did not. The different response rates for women and men to the index questionnaire would tend towards an underestimation of odds ratios of GPspsych-/SCL8+ in the prediction of sick leave and of GPspsych+/SCL8+ in the prediction of use of medication, as the odds ratios in these two cases were higher for men than for women. On the contrary, it would tend towards an overestimation of the prediction odds ratio of GP+/SCL+ for physical health, as the odds ratio was a little higher for women than for men. However, the differences were small and not statistically significant and would not change the conclusion.

As the dropout rate at follow-up was small, non-response must be expected to have had little influence on results. The tendency towards responders being less distressed than non-responders would reduce precision of the estimates if the non-response was non-differential, and the presented confidence intervals would be conservative. The fact that more non-responders had a chronic condition (according to the GPs) suggests that non-responders have a poorer outcome than responders. Hence, the estimates of odds ratios must be conservative.

**Conclusion**

Psychological distress and somatisation are, with almost no exceptions, predictive of outcome in patients with musculoskeletal illness in general practice. It is important to be aware of this when planning preventive initiatives and treatment of these patients. Short standard questionnaires could add value to the GPs’ ratings of somatisation and psychological distress. More research is needed before drawing any conclusion regarding the use of standard questionnaires in clinical practice. Future research in prevention and treatment of musculoskeletal illness should focus not only on physical and social interventions but also on psychological interventions.

**References**


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