

Functional Tools – Pain and Activity Questionnaire

Job dissatisfaction (Bigos, Battie et al. 1991; Papageorgiou, Macfarlane et al. 1997; Thomas, Silman et al. 1999; Linton 2001), fear avoidance and pain catastrophizing (Ciccone and Just 2001; Fritz, George et al. 2001; Buer and Linton 2002) are significant predictors of prolonged disability. Fear avoidance (Crombez, Vlaeyen et al. 1999; Denison, Asenlof et al. 2004) and pain catastrophizing (Smeets, Vlaeyen et al. 2006) may be more important than pain intensity as a determinant of disability, and may impair performance in daily activities (Swinkels-Meewisse, Roelofs et al. 2006). The "Pain and Activity Questionnaire" is a modified version of the "Örebro Musculoskeletal Pain Questionnaire" developed by Linton and Boersma (Linton and Boersma 2003).

WHSCC uses the Pain and Activity Questionnaire in the Work Conditioning assessment to identify claimants at risk for prolonged disability when treatment is based on a purely biological model instead of a biopsychosocial model. A score of over 147 alerts the therapist that work and psychosocial issues may be important contributors to the patient's disability. The Questionnaire scoring instructions are provided below. Persons with work and psychosocial issues may have scores below 147 in the acute injury phase, climbing to well over 147 in the early chronic injury phase.

Scoring Instructions

For Question 3, count the number of pain sites and multiply by 2.

For Questions 4, 5 the score is the number in parenthesis next to what was ticked.

For Questions 6-9, 11-13, 16-18 the score is the number that has been ticked or circled.

For Questions 10, 14-15, 19-23 the score is 10 minus the number that has been ticked or circled.

Add the points to obtain the total score.

References:

Bigos, S. J., M. C. Battie, et al. (1991). "A prospective study of work perceptions and psychosocial factors affecting the report of back injury." *Spine* **16**(1): 1-6.

A longitudinal, prospective study was conducted on 3,020 aircraft employees to identify risk factors for reporting acute back pain at work. The premorbid data included individual physical, psychosocial, and workplace factors. During slightly more than 4 years of follow-up, 279 subjects reported back problems. Other than a history of current or recent back problems, the factors found to be most predictive of subsequent reports in a multivariate model were work perceptions and certain psychosocial responses identified on the Minnesota Multiphasic Personality Inventory (MMPI). Subjects who stated that they "hardly ever" enjoyed their job tasks were 2.5 times more likely to report a back injury ($P = 0.0001$) than subjects who "almost always" enjoyed their job tasks. The quintile of subjects scoring highest on Scale-3 (Hy) of the MMPI were 2.0 times more likely to report a back injury ($P = 0.0001$) than subjects with the lowest scores. The multivariate model, including job task enjoyment, MMPI Scale-3, and history of back treatment, revealed that subjects in the highest risk group had 3.3 times the number of reports in the lowest risk group. These findings emphasize the importance of adopting a broader approach to the multifaceted problem of back complaints in industry and help explain why past prevention efforts focusing on purely physical factors have been unsuccessful.

Functional Tools – Pain and Activity Questionnaire

Buer, N. and S. J. Linton (2002). "Fear-avoidance beliefs and catastrophizing: occurrence and risk factor in back pain and ADL in the general population." *Pain* **99**(3): 485-91.

Fear-avoidance beliefs and catastrophizing have been shown to be powerful cognitions in the process of developing chronic pain problems and there is a need for increased knowledge in early stages of pain. The objectives of this study were therefore, firstly, to examine the occurrence of fear-avoidance beliefs and catastrophizing in groups with different degrees of non-chronic spinal pain in a general population, and secondly to assess if fear-avoidance beliefs and catastrophizing were related to current ratings of pain and activities of daily living (ADL). The study was a part of a population based back pain project and the study sample consisted of 917 men and women, 35-45 years old, either pain-free or with non-chronic spinal pain. The results showed that fear-avoidance beliefs as well as catastrophizing occur in this general population of non-patients. The levels were moderate and in catastrophizing a 'dose-response' pattern was seen, such that more the catastrophizing was, the more was pain. The study showed two relationships, which were between fear-avoidance and ADL as well as between catastrophizing and pain intensity. Logistic regression analyses were performed with 95% confidence intervals and the odds ratio for fear-avoidance beliefs and ADL was 2.5 and for catastrophizing and pain 1.8, both with confidence interval above unity. The results suggest that fear-avoidance beliefs and catastrophizing may play an active part in the transition from acute to chronic pain and clinical implications include screening and early intervention.

Ciccone, D. S. and N. Just (2001). "Pain expectancy and work disability in patients with acute and chronic pain: a test of the fear avoidance hypothesis." *J Pain* **2**(3): 181-94.

According to the fear avoidance model, prolonged disability among patients with chronic nonmalignant pain is due, in part, to an exaggerated fear of pain. At issue in the present study was an attempt to refine the fear-avoidance hypothesis by eliciting estimates of anticipated pain as well as anticipated injury. Along with scores on the Fear Avoidance Beliefs Questionnaire-Work (FABQ-W), a validated measure of fear avoidance, pain and injury expectancies were used as predictors of work disability in a hierarchical regression model. We also examined the possibility that fear avoidance might be confined to patients with chronic pain and thus fail to account for work impairment after the onset of acute injury or illness. Samples of patients with acute (N = 47) and chronic (N = 56) pain completed a battery of psychological tests. Pain and injury expectancies collectively explained 40% to 35% of the variance in work disability compared with 12% to 10% explained by the FABQ-W for the acute and chronic samples, respectively. After controlling for pain duration, depression, somatization, and current pain severity, pain expectancy alone accounted for 16% of the variance in patients in the chronic group (P <.001) and 33% of the variance in patients in the acute group (P <.001). Both pain and injury expectancies were associated equally with work disability for patients in the acute group (P <.001), but only pain expectancy accounted for variance in the chronic group (P <.001). Fear-avoidance beliefs, in the form of cognitive expectancies, may have as much influence on the duration of disability in patients with acute pain as they do in patients with chronic pain.

Crombez, G., J. W. Vlaeyen, et al. (1999). "Pain-related fear is more disabling than pain itself: evidence on the role of pain-related fear in chronic back pain disability." *Pain* **80**(1-2): 329-39.

There is growing evidence for the idea that in back pain patients, pain-related fear (fear of pain/physical activity/(re)injury) may be more disabling than pain itself. A number of questionnaires have been developed to quantify pain-related fears, including the Fear-

Functional Tools – Pain and Activity Questionnaire

Avoidance Beliefs Questionnaire (FABQ), the Tampa Scale for Kinesiophobia (TSK), and the Pain Anxiety Symptoms Scale (PASS). A total of 104 patients, presenting to a rehabilitation center or a comprehensive pain clinic with chronic low back pain were studied in three independent studies aimed at (1) replicating that pain-related fear is more disabling than pain itself (2) investigating the association between pain-related fear and poor behavioral performance and (3) investigating whether pain-related fear measures are better predictors of disability and behavioral performance than measures of general negative affect or general negative pain beliefs (e.g. pain catastrophizing). All three studies showed similar results. Highest correlations were found among the pain-related fear measures and measures of self-reported disability and behavioral performance. Even when controlling for sociodemographics, multiple regression analyses revealed that the subscales of the FABQ and the TSK were superior in predicting self-reported disability and poor behavioral performance. The PASS appeared more strongly associated with pain catastrophizing and negative affect, and was less predictive of pain disability and behavioral performance. Implications for chronic back pain assessment, prevention and treatment are discussed.

Denison, E., P. Asenlof, et al. (2004). "Self-efficacy, fear avoidance, and pain intensity as predictors of disability in subacute and chronic musculoskeletal pain patients in primary health care." *Pain* **111**(3): 245-52.

This study examined the relations between disability, as measured by the Pain Disability Index (PDI) and self-efficacy, fear avoidance variables (kinesiophobia and catastrophizing), and pain intensity, using a prospective design. Two primary health care samples (n(1)=210; n(2)=161) of patients with subacute, chronic or recurring musculoskeletal pain completed sets of questionnaires at the beginning of a physiotherapy treatment period. Multiple hierarchical regression analyses showed that self-efficacy explained a considerably larger proportion of the variance in disability scores than the fear avoidance variables in the first sample. This finding was replicated in the second sample. Pain intensity explained a small, but significant proportion of the variance in disability scores in one sample only. Gender, age, and pain duration were not related to disability. These findings suggest that self-efficacy beliefs are more important determinants of disability than fear avoidance beliefs in primary health care patients with musculoskeletal pain. The findings also suggest that pain-related beliefs, such as self-efficacy and fear avoidance, in turn, are more important determinants of disability than pain intensity and pain duration in these patients.

Fritz, J. M., S. Z. George, et al. (2001). "The role of fear-avoidance beliefs in acute low back pain: relationships with current and future disability and work status." *Pain* **94**(1): 7-15.

Fear-avoidance beliefs have been identified as an important psychosocial variable in patients with chronic disability due to low back pain. The importance of fear-avoidance beliefs for individuals with acute low back pain has not been explored. Seventy-eight subjects with work-related low back pain of less than 3 weeks' duration were studied. Measurements of pain intensity, physical impairment, disability, nonorganic signs and symptoms, and depression were taken at the initial evaluation. Fear-avoidance beliefs were measured with the work and physical activity subscales of the Fear-avoidance Beliefs Questionnaire. Disability and work status were re-assessed after 4 weeks of physical therapy. Patterns of correlation between fear-avoidance beliefs and other concurrently-measured variables were similar to those reported in patients with chronic low back pain. Fear-avoidance beliefs did not explain a significant amount of the variability in initial disability levels after controlling for pain intensity and physical

Functional Tools – Pain and Activity Questionnaire

impairment. Fear-avoidance beliefs about work were significant predictors of 4-week disability and work status even after controlling for initial levels of pain intensity, physical impairment, and disability, and the type of therapy received. Fear-avoidance beliefs are present in patients with acute low back pain, and may be an important factor in explaining the transition from acute to chronic conditions. Screening for fear-avoidance beliefs may be useful for identifying patients at risk of prolonged disability and work absence.

Linton, S. J. (2001). "Occupational psychological factors increase the risk for back pain: a systematic review." *J Occup Rehabil* **11**(1): 53-66.

The purpose of this review was to summarize current knowledge concerning the role of psychological workplace variables in back pain. To this end the literature on psychological factors and back pain was systematically searched and analyzed. Psychological and medical databases and cross-referencing were used to locate 975 studies. To be included in this review, studies had to have a prospective design, include a psychological predictor variable, report on back pain, and be published in English. Twenty-one studies fulfilled the criteria for psychological workplace factors. The results showed a clear association between psychological variables and future back pain. There was strong evidence that job satisfaction, monotonous tasks, work relations, demands, stress, and perceived ability to work were related to future back pain problems. Further, moderate evidence was established for work pace, control, emotional effort at work, and the belief that work is dangerous. There was inconclusive evidence about work content. The attributable fraction indicated that substantial reductions in the number of cases of back pain could be achieved if the exposure to the psychological risk factor was eliminated. Although the methodological quality of the studies varied, they were deemed to provide "best evidence," and the consistency of the findings suggests that they are relatively robust. It is concluded that psychological work factors play a significant role in future back pain problems. However, there is still a lack of knowledge concerning the mechanisms by which these operate. These results suggest that a change in the way we view and deal with back pain is needed. Applying knowledge about psychological factors at work might enhance prevention as well as rehabilitation.

Linton, S. J. and K. Boersma (2003). "Early identification of patients at risk of developing a persistent back problem: the predictive validity of the Orebro Musculoskeletal Pain Questionnaire." *Clin J Pain* **19**(2): 80-6.

OBJECTIVE: To test the predictive utility of the Orebro Musculoskeletal Pain Screening Questionnaire in identifying patients at risk for developing persistent back pain problems. **DESIGN:** Prospective, where participants completed the questionnaire and their cases were followed for 6 months to assess outcome with regard to pain, function, and absenteeism due to sickness. **PARTICIPANTS:** One hundred seven patients, recruited from seven primary care units. **RESULTS:** Discriminant analyses showed that the items on the questionnaire were significantly related to future problems. For absenteeism due to sickness, 68% of the patients were correctly classified into one of three groups, whereas an even distribution would have produced 33%. The analyses for function correctly classified 81%, and for pain 71%, into one of two groups, compared with a chance level of 50%. A total score analysis demonstrated that a cutoff score of 90 points had a sensitivity of 89% and a specificity of 65% for absenteeism due to sickness, and a sensitivity of 74% and a specificity of 79% for functional ability. **CONCLUSIONS:** The results underscore that psychological variables are related to outcome 6 months later, and they replicate and extend earlier findings indicating that the Orebro Screening

Functional Tools – Pain and Activity Questionnaire

Questionnaire is a clinically reliable and valid instrument. The total score was a relatively good predictor of future absenteeism due to sickness as well as function, but not of pain. The results suggest that the instrument could be of value in isolating patients in need of early interventions and may promote the use of appropriate interventions for patients with psychological risk factors.

Papageorgiou, A. C., G. J. Macfarlane, et al. (1997). "Psychosocial factors in the workplace--do they predict new episodes of low back pain? Evidence from the South Manchester Back Pain Study." *Spine* 22(10): 1137-42.

STUDY DESIGN: A prospective, population-based cohort study of working adults. **OBJECTIVES:** To determine whether work-related psychosocial factors and social status predict the occurrence of new episodes of low back pain and influence consultation behavior. **SUMMARY AND BACKGROUND DATA:** Dissatisfaction with work and social status has been associated with low back pain in several studies; few of these studies have been prospective or population based. **METHODS:** An initial postal survey was returned by 4,501 (59%) adults (18-75 years old) registered with two primary care practices. From this, a cohort of 1,412 people currently in employment and free of low back pain was identified, and baseline information on work-related psychosocial factors and psychologic distress was obtained. Social class was derived from current occupation using a standardized classification. New episodes of low back pain occurring in the next 12 months were identified by continuous monitoring of primary care consultants and by mailing a second questionnaire a year later to identify occurrences of low back pain for which no consultation was sought. **RESULTS:** The baseline cross-sectional survey showed modest but significant associations between low back pain and perceived inadequacy of income (risk ratio 1.3), dissatisfaction with work (risk ratio 1.4) and social class IV/V (risk ratio 1.2). In the follow-up year, the risk of reporting low back pain for which no consultation was sought doubled in those dissatisfied with their work. Both perceived inadequacy of income (odds ratio 3.6) and social class IV/V (odds ratio 4.8) were strongly associated with consulting with a new episode of low back pain during the follow-up year, an association more marked in women. The associations with work dissatisfaction and perceived adequacy of income were not explained by general psychologic distress or social status. **CONCLUSION:** People dissatisfied with work are more likely to report low back pain for which they do not consult a physician, whereas lower social status and perceived inadequacy of income are independent risks for working people to seek consultation because of low back pain.

Smeets, R. J., J. W. Vlaeyen, et al. (2006). "Reduction of pain catastrophizing mediates the outcome of both physical and cognitive-behavioral treatment in chronic low back pain." *J Pain* 7(4): 261-71.

The aim of this study was to examine whether treatments based on different theories change pain catastrophizing and internal control of pain, and whether changes in these factors mediate treatment outcome. Participants were 211 patients with nonspecific chronic low back pain (CLBP) participating in a randomized controlled trial, attending active physical treatment (APT, n = 52), cognitive-behavioral treatment (CBT, n = 55), treatment combining the APT and CBT (CT, n = 55), or waiting list (WL, n = 49). Pain catastrophizing decreased in all 3 active treatment groups and not in the WL. There was no difference in the change in internal control across all 4 groups. In all the active treatment groups, patients improved regarding perceived disability, main complaints, and current pain at post-treatment, and no changes were observed in the WL group. Depression only changed significantly in the APT group. Change in pain catastrophizing

Functional Tools – Pain and Activity Questionnaire

mediated the reduction of disability, main complaints, and pain intensity. In the APT condition, pain catastrophizing also mediated the reduction of depression. Not only cognitive-behavioral treatments but also a physical treatment produced changes in pain catastrophizing that seemed to mediate the outcome of the treatment significantly. The implications and limitations of these results are discussed. PERSPECTIVE: This article shows that treatment elements that do not deliberately target cognitive factors can reduce pain catastrophizing. Reduction in pain catastrophizing seemed to mediate the improvement of functioning in patients with chronic low back pain. The results might contribute to the development of more effective interventions.

Swinkels-Meewisse, I. E., J. Roelofs, et al. (2006). "Acute low back pain: pain-related fear and pain catastrophizing influence physical performance and perceived disability." *Pain* **120**(1-2): 36-43.

Pain-related fear and pain catastrophizing are associated with disability and actual performance in chronic pain patients. In acute low back pain (LBP), little is known about the prediction of actual performance or perceived disability by pain-related fear and pain catastrophizing. This experimental, cross-sectional study aimed at examining whether pain-related fear and pain catastrophizing were associated with actual performance and perceived disability. Ninety six individuals with an episode of acute LBP performed a dynamic lifting task to measure actual performance. Total lifting time was used as outcome measure. The results show that pain-related fear, as measured with the Tampa Scale for Kinesiophobia, was the strongest predictor of this physical task. Using the Roland Disability Questionnaire as a measure of perceived disability, both pain-related fear and pain catastrophizing, as measured with the Pain Catastrophizing Scale, were significantly predictive of perceived disability and more strongly than pain intensity was. The results of the current study suggest that pain-related fear is an important factor influencing daily activities in individuals suffering an episode of acute LBP. The study results have important clinical implications, especially in the development of preventive strategies for chronic LBP.

Thomas, E., A. J. Silman, et al. (1999). "Predicting who develops chronic low back pain in primary care: a prospective study." *BMJ* **318**(7199): 1662-7.

OBJECTIVES: To quantify the relative contribution of premorbid and episode specific factors in determining the long term persistence of disabling symptoms of low back pain. DESIGN: Prospective cohort study. SETTING: Two general practices in the south Manchester area. PARTICIPANTS: 180 patients, who previously participated in a cross sectional population survey, who consulted because of low back pain during the study period. They were followed at 1 week and 3 and 12 months after consultation. MAIN OUTCOME MEASURE: Persistent disabling low back pain in the 12 months after the consultation. RESULTS: Disabling low back pain persisted in one third of participants after consultation and was more common with increasing age, among those with a history of low back pain, and in women. Persistence of symptoms was associated with "premorbid" factors (high levels of psychological distress (odds ratio 3.3; 95% confidence interval 1.5 to 7.2), poor self rated health (3.6; 1.9 to 6.8), low levels of physical activity (2.8; 1.4 to 5.6), smoking (2.1; 1.0 to 4.3), dissatisfaction with employment (2.4; 1.3 to 4.5)) and factors related to the episode of low back pain (duration of symptoms, pain radiating to the leg (2.6; 1.3 to 5.1), widespread pain (6.4; 2.7 to 15), and restriction in spinal mobility). A multivariate model based on six factors identified groups whose likelihood of persistent symptoms ranged from 6% to 70%.

Functional Tools – Pain and Activity Questionnaire

CONCLUSIONS: The presence of persistent low back pain is determined not only by clinical factors associated with pain but also by the premorbid state.