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ORIGINAL REPORT

KINESIOPHOBIA IN PATIENTS WITH CHRONIC MUSCULOSKELETAL PAIN: DIFFERENCES BETWEEN MEN AND WOMEN

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Objective: **To investigate the degree of kinesiophobia in patients with chronic pain, to examine differences in kinesiophobia and other pain-related characteristics between men and women, and to examine differences in pain-related characteristics between patients with high and low levels of kinesiophobia.**
Design: **Postal survey.**
Subjects/patients: **Eighty-eight men and 173 women with chronic musculoskeletal pain.**
Methods: **Patients completed questionnaires covering background data, pain variables, disability and psychological characteristics. The Swedish version of Tampa Scale for Kinesiophobia (TSK-SV) was used to measure kinesiophobia.**
Results: **Kinesiophobia (TSK-SV score >37) was found in 56% of patients, with men having a higher frequency (72%) than women (48%). Pain intensity was correlated with TSK-SV score in both men and women. No correlations were found between kinesiophobia and age, pain duration or probable depression/anxiety. Women with high kinesiophobia tended to be younger, had more pain and showed more tiredness, disability, stress, interference and life dissatisfaction compared with women with low kinesiophobia. These differences were not seen in men.**
Conclusion: **The results indicate differences between men and women with chronic pain. The use of the TSK-SV questionnaire might assist therapists to identify patients whose fear of movement may negatively impact their rehabilitation. There is some evidence to suggest that optimal cut-off scores may differ between male and female patients.**

Key words: Tampa scale, kinesiophobia, pain, rehabilitation.

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INTRODUCTION

Pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (1). Pain that persists beyond the normal time of healing is known as "chronic pain". In practice, 6 months is preferred as the division between the acute and chronic pain states (2).

In Sweden, musculoskeletal disorders are the most commonly reported reason for pain, with 15% of men and 21% of women describing long-term diseases or disorders affecting the musculoskeletal system. The prevalence of ongoing pain symptoms increases when considering those of working age, with one-third of men and one-half of women being affected. Additionally, impaired mobility is a growing problem in younger women (3). Chronic pain is known to interfere with activities of daily living and can generate an experience of illness and dissatisfaction with life. In short, chronic pain causes human suffering and high economic costs to society (4).

The prevailing model of chronic pain and pain disability emphasizes the multifactorial nature of this condition. The precise combination of factors responsible for the development and/or maintenance of chronic pain is not fully understood; however, fear avoidance is commonly implicated. The fear avoidance model of pain, as proposed by Vlaeyen et al. (5) and Vlaeyen & Linton (6), based upon previous work, provides an explanation of how disability associated with chronic low back pain (CLBP) may develop from an episode of acute low back pain. This model suggests that when pain is perceived as non-threatening, people tend to maintain engagement in daily activities. Conversely, when pain is interpreted catastrophically, it may lead to pain-related fear and safety-seeking behaviours. There is growing support for this model, in which pain-related fear and kinesiophobia are situated together (7). Kinesiophobia, which was introduced by Kori et al. (8) in 1990, is defined as "an excessive, irrational, and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or reinjury".

A recent review suggests that pain-related fear is closely associated with catastrophic interpretations of pain. Fear of pain may also lead to avoidance, escape and hyper-vigilance behaviours. While functional disability can arise as a result of pain-related fear, the severity of pain is also likely to play an important role (9). However, to our knowledge, little is known about the influence of gender on these functions/behaviours.

The Pain Rehabilitation Clinic at the University Hospital, Umeå, Sweden, provides interdisciplinary assessment and rehabilitation for patients with chronic musculoskeletal pain. While validated questionnaires exploring various aspects and

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consequences of pain are routinely used as part of this assessment, there is a lack of systematic evaluation of fear avoidance. It was considered important to address this issue and to determine whether this approach could enhance the assessment and management of patients with chronic pain.

Therefore, the aims of this study were: (*i*) to investigate the degree of kinesiophobia in patients with chronic pain; (*ii*) to examine differences in kinesiophobia and other pain-related characteristics between men and women; and (*iii*) to examine differences in pain-related characteristics between patients with high and low levels of kinesiophobia.

METHODS

Subjects

The study group consisted of consecutive patients with musculoskeletal pain, referred to the Pain Rehabilitation Clinic at the University Hospital, Umeå, Sweden, during a 13-month period between December 2003 and December 2004.

Study design

This is a questionnaire study, in which all questionnaires were sent to the patients prior to the assessment in the clinic. All questionnaires were returned in an envelope before the initial assessment.

Measurements

Kinesiophobia was evaluated using the Swedish version of the Tampa Scale for Kinesiophobia (TSK-SV) (10). The TSK-SV is a 17-item questionnaire, designed to assess kinesiophobia. Respondents are asked to indicate their level of agreement to each of the 17 statements on a 4-point response scale, with scoring alternatives from "strongly disagree" to "strongly agree". Four items (4, 8, 12 and 16) are reverse-worded statements. Total scores range from 17 to 68, with scores greater than 37 indicating a high degree of kinesiophobia (5)**.** The TSK-SV has been tested for use on patients with chronic pain and is considered to have face and content validity as well as stability over time and internal consistency (10).

The questionnaires currently in use at the clinic collect information regarding demographic and educational data, pain-related variables, such as pain intensity and duration, perceived health and physical activity, and psychological characteristics. The validated evaluation instruments in use are listed below.

The Disability Rating Index (DRI) (12 items) is a measurement of physical disability. It covers activities ranging from dressing and walking, to more work-related activities, such as lifting. The patients rate their perceived ability to perform the activities on a 100-mm visual analogue scale (VAS) that is anchored with the responses "without difficulty" (0 mm) and "not at all" (100 mm). The mean value from the 12 items provides the DRI. The DRI has shown an acceptable reliability and validity (11).

The Modified Somatic Perception Questionnaire (MSPQ) (13 items) aims to measure somatic and autonomic perception. The response to each item is ranked from 0 to 3. The scores are added together and divided by the number of questions answered to give the final MSPQ score. A high value indicates a high level of stress and somatic symptoms. The MSPQ has been validated, is easy to administer and has a high compliance (12).

The Multidimensional Pain Inventory (MPI) contains 61 questions assessing various aspects of the chronic pain experience. Responses are recorded using a 7-point response scale. The MPI contains one psychosocial section and 2 behavioural sections. The MPI demonstrates good validity and reliability (13).

Life Satisfaction (Li-Sat) 11 is a self-report checklist with levels of satisfaction ranging along a 6-point response scale from 1 = very dissatisfied to 6 = very satisfied (14). It covers life satisfaction in different areas both domain-specific (10 items) and global (1 item), and is based on Li-Sat 9 (15), which has been found to show acceptable test-retest reliability, specificity and sensitivity (16).

The Hospital Anxiety and Depression Scale (HAD) (14 items) is a questionnaire for the measurement of anxiety and depression (17). Each item has a 4-response category range between 0 and 3. The scale ranges between 0 and 21 for both depression and anxiety. The HAD has acceptable validity (18, 19) and internal consistency (18). According to Zigmond & Snaith (17) scores < 8 are "non-cases"; scores 8–10 "possible cases" and scores > 10 "probable cases" of anxiety and depression, respectively.

The TSK-SV questionnaires were sorted by a secretary, coded in the same way as other questionnaires and then filed until data analysis commenced. The remaining questionnaires were used as usual during the clinical assessment.

Ethical considerations

The study was performed according to the Declaration of Helsinki. The patients were given written information about the study. They were informed that participation was voluntary and that the TSK-SV questionnaire was used only for research purposes, not for assessment or interventions. The questionnaires were stored in locked archives and patient identifications were deleted prior to statistical analysis.

Data analysis

All data was coded and analysed with the Statistical Package for the Social Sciences (SPSS version 11.5–12.01 for Windows). Descriptive statistics were used for demographic data and presented as mean and standard deviation. Differences between gender, low and high responders (kinesiophobia), pain variables and psychological characteristics were tested with a Student's *t*-test on continuous variables, and Pearson's χ^2 test when data was categorical. Mann-Whitney *U* test was used when any of the compared groups were small (< 30) or when the variables were non-continuous. Pearson's correlation test was used for calculating correlations between TSK-SV score and age, pain intensity and pain duration. Bonferroni-Holm adjustment for multiple comparisons was made. The level of significance was set at $p < 0.05$.

RESULTS

During the study period 365 patients were assessed in the clinic. The standard questionnaires, together with the TSK-SV questionnaire, were returned by 295 of the 365 patients (81%). There were 215 fully completed TSK-SV questionnaires. Questionnaires with 2 or less missed items ($n = 46$) were accepted after missing items were replaced with the mean response for that item derived from the fully completed questionnaires. The remaining 34 questionnaires were excluded due to missing basic demographic data or more than 2 missed items, leaving a total of 261 included questionnaires and a calculated reply frequency of 72%. There were 88 men (34%) and 173 women (66%). The range of pain duration was 67 days to 40 years. Pain duration > 6 months was noted in 96% of cases. Pain duration was < 6 months in 4% of cases, 6–12 months in 10%, 1–3 years in 36% and > 3 years in 50%. Data are shown in Table I.

Mean TSK-SV scores were significantly higher for men than women. Average tiredness during the last week was higher in women; however, after Bonferroni-Holm adjustment, this difference was not significant. Average pain during the last week was significantly correlated with TSK-SV in both men ($r = 0.283$, $p = 0.008$) and women ($r = 0.347$, $p = 0.000$). There

Table I. *Questionnaire responses for the entire group (n = 261), men (n = 88) and women (n = 173). Means, with standard deviation in parentheses*

Variable	Total (n=261)	Men (n=88)	Women (n=173)	p-value
Age (years)	37.7 (9.4)	39.5 (9.8)	36.8 (9.0)	0.031
TSK-SV total score	39.6 (8.5)	43.4 (8.6)	37.7 (7.9)	0.000*
Pain duration (days)	2551 (2430)	2276 (2612)	2695 (2325)	0.223
Days with continuous pain	1701 (1817)	1615 (2080)	1751 (1651)	0.640
Perceived health (VAS)	53.3 (21.6)	55.9 (21.4)	51.9 (21.6)	0.175
Average pain last week (VAS)	62.2 (19.1)	62.5 (19.9)	62.0 (18.7)	0.864
Average tiredness last week (VAS)	66.9 (22.4)	62.2 (24.7)	69.3 (20.9)	0.023
Future confidence in how getting back to work	3.8 (1.0)	3.9 (1.1)	3.8 (0.9)	0.174
Future confidence when getting back to work	3.3 (1.1)	3.5 (1.2)	3.3 (1.1)	0.057
Future confidence in recovery	3.8 (1.2)	3.9 (1.2)	3.7 (1.2)	0.226
DRI-index	49.4 (18.7)	49.9 (19.11)	49.1 (18.5)	0.766
MSPQ – total score	0.8 (0.4)	0.7 (0.4)	0.8 (0.4)	0.193
MPI – pain severity	4.2 (0.9)	4.3 (0.9)	4.2 (0.9)	0.666
MPI – interference	4.3 (1.0)	4.3 (0.9)	4.3 (1.1)	0.903
MPI – life control	2.8 (1.0)	2.9 (1.0)	2.8 (1.0)	0.663
MPI – affective distress	3.2 (1.3)	3.2 (1.3)	3.2 (1.2)	0.761
MPI – general activity	2.6 (0.8)	2.5 (0.8)	2.7 (0.7)	0.095
LiSat-11 – ADL	4.4 (1.3)	4.4 (1.2)	4.5 (1.3)	0.253
LiSat-11 – Life as a whole	3.8 (1.3)	3.7 (1.4)	3.8 (1.2)	0.555
LiSat-11 – Somatic health	2.2 (1.1)	2.3 (1.1)	2.1 (1.9)	0.141
LiSat-11 – Psychological health	3.7 (1.0)	3.7 (1.5)	3.7 (1.4)	0.892
HAD – Depression	7.1 (4.3)	7.1 (4.2)	7.1 (4.2)	0.958
HAD – Anxiety	6.9 (4.2)	7.1 (4.4)	6.8 (4.2)	0.741

*Significant p-values after correction for mass significance according to Bonferroni–Holm.
TSK-SV: Tampa Scale for Kinesiophobia, Swedish Version; DRI: Disability Rating Index; VAS: visual analogue scale; MSPQ: Modified Somatic Perception Questionnaire; MPI: Multidimensional Pain Inventory; Li-Sat-11: Life Satisfaction 11; ADL: Activities of Daily Living; HAD: Hospital Anxiety and Depression scale.

were no correlations between TSK-SV score and pain duration, or between TSK-SV score and number of days with continuous pain. The main localization of the pain was varying in 47% of the patients, while the main localization was the neck in 21% of the patients.

A high degree of kinesiophobia (total TSK-SV score > 37) was found in 147 out of 261 patients (56%), 64 out of 88 men (72%) and 83 out of 173 women (48%). The difference in frequency between men and women was statistically significant ($\chi^2 = 14.525$, df = 1, $p = 0.000$).

When splitting men and women respectively in groups of high (> 37) and low (≤ 37) kinesiophobia, there were several significant differences seen in the related variables (Table II). DRI was significantly higher in women with high TSK-SV score, meaning a higher subjective experience of disability compared with women with low TSK-SV score. No such difference was seen in men. When analysing the different items in DRI, all items except running showed significantly higher values in women with high TSK-SV scores compared with women with low TSK-SV scores. Only for the sporting activity item on the DRI did men with high and low TSK-SV scores differ, men with high TSK-SV scores experienced more disability in sporting activity.

The only difference concerning mean values of depression and anxiety (HAD-score) was that women with high TSK-SV score had a higher depression score than women with low TSK-SV score; however, after Bonferroni-Holm adjustment the difference was not significant. The percentage of women with HAD scores > 10 (probable depression/anxiety) did not differ between women with high and low TSK-SV scores. No differences in HAD-scores were seen between men with high and low kinesiophobia.

In 69 of the 261 cases (26%) there was a history of trauma. No difference in total TSK-SV scores was noted between patients with and without previous trauma.

DISCUSSION

This study set out to investigate the phenomenon of kinesiophobia among patients with chronic pain presenting to a specialist pain rehabilitation clinic. In particular we sought to address the question of whether gender influences kinesiophobia or other pain-related characteristics. Patients referred to the clinic were asked to return completed questionnaires by post prior to their initial assessment; the response rate from the 261 eligible subjects was 72%. Two-thirds of the studied subjects were female, which is in accordance with the general pattern of patients seen within the clinic. Most patients (96%) had chronic pain, with symptom duration longer than 6 months.

Mean TSK-SV score in the studied group was 39.6. Comparable data on TSK scores in previous studies vary between 33.5 and 44.5 (20, 21). The patient group in our study was a selected group of patients with chronic pain referred to a pain rehabilitation clinic. Denison et al. (22) found lower TSK scores (mean 34.1) in patients with musculoskeletal pain seeking physiotherapists in primary care. Houben et al. (23)

Table II. *Questionnaire responses for men with high (n = 64) and low (n = 24) TSK-SV scores, and for women with high (n = 83) and low (n = 90) TSK-SV scores. Means, with standard deviation in parentheses*

	Men			Women		
Variable	High (>37) (*n*=64)	Low (≤37) (*n*=24)	*p*-value	High (>37) (*n*=83)	Low (≤37) (*n*=90)	*p*-value
Age (years)	40.1 (10.0)	37.8 (9.4)	0.497	35.1 (8.7)	38.4 (9.0)	0.020
TSK-SV total score	47.5 (5.9)	32.4 (3.9)	0.000*	44.5 (4.8)	31.5 (4.0)	0.000*
Pain duration (days)	2475 (2922)	1732 (1378)	0.615	2666 (2319)	2723 (2345)	0.822
Days with continuous pain	1731 (2339)	1277 (956)	0.741	1873 (1664)	1612 (1640)	0.290
Perceived health (VAS)	58.9 (21.4)	47.7 (19.6)	0.057	60.5 (20.9)	43.9 (19.0)	0.000*
Average pain last week (VAS)	65.9 (19.4)	53.6 (18.5)	0.007	68.3 (18.6)	56.2 (17.0)	0.000*
Average tiredness last week (VAS)	63.3 (26.2)	59.3 (20.4)	0.226	74.1 (19.8)	64.9 (20.9)	0.001*
Future confidence in how getting back to work	4.1 (1.0)	3.5 (1.2)	0.031	4.0 (0.8)	3.6 (1.0)	0.004
Future confidence when getting back to work	3.5 (1.2)	3.4 (1.1)	0.057	3.5 (1.0)	3.0 (1.1)	0.003
Future confidence in recovery	4.1 (1.1)	3.5 (1.3)	0.086	3.9 (1.2)	3.5 (1.2)	0.034
DRI-index	51.7 (18.5)	45.0 (20.1)	0.112	55.7 (15.7)	43.0 (18.8)	0.000*
MSPQ – total score	0.7 (0.4)	0.7 (0.4)	0.743	0.9 (0.5)	0.7 (0.4)	0.001*
MPI – pain severity	4.4 (0.9)	3.9 (0.8)	0.050	4.6 (0.8)	3.9 (0.8)	0.000*
MPI – interference	4.5 (0.8)	3.9 (1.1)	0.030	4.7 (0.9)	3.9 (1.1)	0.000*
MPI – life control	2.9 (1.0)	2.9 (1.1)	0.579	2.6 (1.1)	3.0 (1.0)	0.031
MPI – affective distress	3.2 (1.4)	3.0 (1.1)	0.353	3.5 (1.3)	3.0 (1.1)	0.007
MPI – general activity	2.5 (0.9)	2.6 (0.7)	0.880	2.6 (0.8)	2.8 (0.6)	0.086
LiSat-11 – ADL	4.3 (1.2)	4.5 (0.9)	0.383	4.1 (1.4)	4.8 (1.2)	0.000*
LiSat-11 – Life as a whole	3.7 (1.4)	3.6 (1.4)	0.730	3.4 (1.2)	4.2 (1.1)	0.000*
LiSat-11 – Somatic health	2.3 (1.1)	2.5 (1.3)	0.437	1.8 (1.0)	2.4 (1.0)	0.000*
LiSat-11 – Psychological health	3.6 (1.4)	3.7 (1.5)	0.951	3.4 (1.4)	3.9 (1.4)	0.023
HAD – Depression	7.3 (4.3)	6.6 (4.0)	0.555	7.7 (4.2)	6.5 (4.1)	0.037
HAD – Anxiety	7.6 (4.7)	5.9 (3.2)	0.140	7.4 (4.4)	6.3 (3.9)	0.076

*Significant *p*-values after correction for mass significance according to Bonferroni–Holm.
TSK-SV: Tampa Scale for Kinesiophobia, Swedish Version; DRI: Disability Rating Index; VAS: visual analogue scale; MSPQ: Modified Somatic Perception Questionnaire; MPI: Multidimensional Pain Inventory; Li-Sat-11: Life Satisfaction 11; ADL: Activities of Daily Living; HAD: Hospital Anxiety and Depression scale.

reported even lower mean scores in patients with and without back complaints (33.6 and 32.9, respectively) while Lundberg et al. (10) found a median of 30 in a training group.

In a prospective descriptive Swedish study on musculoskeletal pain by Lundberg et al. (24), associations were found between kinesiophobia and pain variables (pain severity and pain intensity), disability (DRI) and psychological characteristics (MPI-S). Average pain during the last week and TSK-SV score were significantly correlated in our study, which is in accordance with Eccleston & Crombez (25), who suggested that pain intensity might drive escape and avoidance behaviours. Cook et al. (26) described that the TSK score decreased with age in patients with chronic pain; this was not the case in the current study.

In our study we found differences between men and women; the men were older and had a higher TSK-SV score than women (mean value 43.4 and 37.7, respectively), and they also reported a higher degree of disability in sitting and bending forward, as described by DRI. Women had a higher degree of tiredness and reported more problems with carrying, as described by DRI. However, after Bonferroni-Holm correction only the difference in total TSK-SV score between genders retained significance. A gender difference in TSK score has also been described in a few studies on smaller groups of patients with chronic low back pain and musculoskeletal pain (5, 24, 27, 28). These results however, are equivocal. The mean TSK scores in women in these studies differ between 36.6 and 40.6, and between 38.4 and 40.8 in men. In 3 of the studies men showed higher scores (7, 24, 28), while one study (27) reported lower scores in men.

The TSK score is used to classify patients with a high or low degree of kinesiophobia; however, there is no consensus among authors regarding appropriate cut-off scores. In the current study, we chose a mean of > 37 to classify patients with a high degree of kinesiophobia (56%). Both the cut-off score and the frequency of patients with a high degree of kinesiophobia are in accordance with Vlaeyen et al. (5) and Lundberg et al. (24), who reported 48% and 54%, respectively, in studies of patients with musculoskeletal pain. In our study group, approximately 73% of the men showed a high degree of kinesiophobia compared with 48% of the women. The difference between men and women was statistically significant ($p = 0.000$).

In our study, a comparison between the groups with high and low kinesiophobia in men and women respectively, shows significant differences. The group of women with high kinesiophobia tended to be younger, and had more severe pain than the group of women with low kinesiophobia, though the pain duration was similar. The high kinesiophobia group of women also described a higher degree of disability (DRI index), interference (MPI), ADL, somatic health and life as a whole (Li-Sat). The substantial disability and affected quality of life noted among females with high kinesiophobia levels

suggests that early identification of this relatively young group is warranted. As mentioned above, a high frequency of the men with chronic pain had a TSK-SV score > 37. However, the consequences concerning disability and psychological characteristics were not so obvious.

While the differences in TSK-SV score concerning age and gender in our study were notable, it could not be concluded whether the differences were due to the painful condition or merely related to general age or gender differences, since there are sparse data on healthy populations. Houben et al. (23) suggested the use of a lower cut-off score for examining kinesiophobia within the general population, but made no mention of gender differences. According to our results, where there were differences in distribution of high and low kinesiophobia in men and women with similar pain history, it may be appropriate to determine different TSK cut-off points for men and women.

Concerning anxiety and depression, the HAD scores in our study were generally low. There were no differences in mean anxiety and depression scores between men and women. Neither were there any differences when comparing the frequency of probable anxiety and depression (HAD score > 10) between men and women. The only notable difference concerning HAD in our study is that women with a high degree of kinesiophobia had a tendency to a higher mean HAD depression value than women with a low degree of kinesiophobia.

Additionally, we found no correlations between TSK-SV score and trauma. Some authors (29, 30) have suggested that fear-avoidance beliefs may be more common when the acute pain state problem results from a sudden traumatic injury. Crombez et al. (21) found evidence for this assumption, in that patients who reported sudden traumatic onset of pain scored higher on the TSK compared with patients who reported pain that had started gradually. In our study, the principal division between traumatic or non-traumatic patients was based on the diagnosis, which might be a source of error, since patients with chronic pain do not always connect the start of their pain with a previous traumatic event.

The TSK-SV questionnaire is self-reported, easy to administer, requires little time and is inexpensive. In the current study, this was one of many self-reported instruments used in the clinic. It must be noted that too many questionnaires might be tiring for the patient and therefore affect the compliance negatively. Also, it can not be denied that item formulations in the TSK-SV questionnaire sometimes seemed too complicated and triggered critical comments from the patients. Approximately 20% of the questionnaires were not fully completed, although 10% were corrected and accepted, and only 10% excluded. There were no differences when comparing data from the standard questionnaires between patients with corrected and total completed TSK-SV questionnaires. Nor did we find that the missing items were solely the reversed items.

Arguments can be made both for and against the validity of comparing scores between different groups of patients; nonetheless this study contributes reference scores for these sub-groups that are representative of patients seen in our clinic. To our knowledge, the instrument is not widely used in the clinical assessment of pain, even though there is a growing attempt to investigate the usefulness of TSK-SV. Our opinion is that the instrument ought to be used more frequently, because it is simple to use and might contribute to more appropriately tailored rehabilitation. Future research should focus on reaching consensus regarding definitions and cut-off levels in different patient groups.

In our experience, the TSK-SV instrument can be of great value in the initial patient assessment. Special attention should perhaps be given to young female pain patients who express and/or demonstrate fear of activities. This fear ought to be taken into consideration when planning rehabilitation.

In conclusion, the results showed that men had higher mean TSK-SV scores compared with women. However, women with high scores experienced more negative apprehension about their pain situation than men. Women with high scores tended to be younger than women with low scores, and experienced more negative consequences. Young women with a high degree of kinesiophobia ought to be given special attention. There is some evidence to suggest that optimal cut-off scores may differ between male and female patients.

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