TITLE: Physical Therapists' Ability to Identify Psychological Factors and Their Self-Reported Competence to Manage Chronic Low Back Pain

RUNNING HEAD: Physical Therapist Ability to Manage Psychological Factors

TOC CATEGORY: Original Research

ARTICLE TYPE: Pain Management

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Background. In the management of chronic low back pain (LBP), identifying and dealing with more patients who are at high risk and who have psychological barriers to recovery is important yet difficult.

Objectives. The objective of this study was to test physical therapists' ability to allocate patients into risk stratification groups, test correlations between therapists' assessments of psychological factors and patient questionnaires, and explore relationships between psychological factors and therapists' self-reported competence to manage patients with chronic LBP.

Design. This was a pragmatic, observational study.

Methods. Patients completed the STarT Back Tool (SBT, for risk stratification), the Four-Dimensional Symptom Questionnaire (distress, depression, anxiety), and the Tampa Scale of Kinesiophobia (kinesiophobia) prior to the intake session. After this session, physical therapists

estimated patient prognostic risk using the 3 SBT categories and rated patient psychological factors using a 0-to-10 scale. Finally, therapists reported their self-reported competence to manage the patient. Intraclass and Spearman rank correlations tested correlations between therapists' intuitive assessments and patient questionnaires. A linear mixed model explored relationships between psychological factors and therapists' self-reported competence.

Results. Forty-nine patients were managed by 20 therapists. Therapists accurately estimated SBT risk allocation in only 41% of patients. Correlations between therapist perceptions and patient questionnaires were moderate for distress (r =0.602) and fair for depression (r =0.304) and anxiety (r =0.327). There was no correlation for kinesiophobia (r =-0.007). Patient distress was identified as a negative predictor of therapists' self-reported competence.

Limitations. This was a cross-sectional study, conducted in only 1 center.

Conclusions. Physical therapists were not very accurate at allocating patients into risk stratification groups or identifying psychological factors. Therapists' self-reported competence in managing patients was lowest when patients reported higher distress.

Chronic low back pain (LBP) is a complex and multidimensional health problem associated with a high personal and economical burden.[1-5] Psychological factors play an important role in the development and maintenance of chronic LBP.[6-8] Kinesiophobia, pain-related fear and depressive mood are predictors for developing persistent pain and disability.[7,9] Furthermore, comorbid mental illnesses are very common in patients with chronic LBP.[10,11] Therefore, it would seem appropriate for physical therapists and other health care professionals managing chronic LBP patients to be able to identify psychological factors, with a view to enhancing outcomes.

Different patient questionnaires have been developed for the assessment of psychological factors associated with LBP. The STarT Back Tool (SBT) is a risk stratification instrument frequently used to help health care professionals in their initial assessment to identify patient's overall risk status for chronic LBP and disability.[12] Scores from the SBT allocate patients in low-, medium- or high-risk groups according to patients' prognostic risk for poor outcomes. Several other patient questionnaires have been developed to identify psychological factors associated with LBP. The Tampa Scale of Kinesiophobia (TSK) is used to measure kinesiophobia,[13] and the Four-Dimensional Symptoms Questionnaire (4DSQ) is a questionnaire used to screen for symptoms of distress, depression, anxiety and somatization.[14] LBP practice guidelines recommend health care professionals use standardized patient questionnaires for the assessment of patients' prognostic risk,[15] and for the screening of psychological factors.[16] Nevertheless, patient questionnaires are not always implemented in clinical practice.[17]

The literature reveals inconsistent results regarding physical therapists' ability to estimate patients' prognostic risk and to allocate patients into different risk stratification groups. Bishop et al[18] reported that most physical therapists recognize intuitively when a patient is at high risk for developing chronicity. Hill et al,[19] however, tested agreement between clinical experts' allocation into risk stratification groups and patient allocation based on scores of the SBT. They found only moderate agreement between the formal screening questionnaire and clinicians' intuition.[19] These 2 studies used clinical vignettes or videos to measure physical therapists' ability to allocate patients in subgroups,[18,19] but therapists' clinical skills to allocate patients into risk stratification groups has not been previously tested in real clinical practice. Indirect methods such as vignettes may not be adequate to measure physical therapists' behaviour or their skills in managing LBP.[20] Other pragmatic, observational studies disclosed therapists' difficulty in clinical practice to intuitively assess distress, fear-avoidance beliefs,[21,22] and symptoms of depression.[23] Based on these findings, it is possible that physical therapists

depend on patient questionnaires to allocate patients into risk stratification groups as well as to recognise psychological factors.

Qualitative research has shown that musculoskeletal physical therapists tend to stigmatize, or feel unprepared to manage, patients with chronic LBP and dominant psychological factors.[24-26] Therefore, it could be assumed that physical therapists perceive themselves as less competent managing patients with high psychological distress. In psychotherapy research, it has been shown that therapists' self-reported experience of difficulties in practice have a negative influence on the patient-therapist alliance,[27] with a positive relationship found between alliance and treatment outcomes.[28] It was hypothesized that therapist qualities (eg, therapist knowledge and skills) may also influence the 'patient-therapist' alliance in physical therapist practice, as well as treatment outcomes.[29] However, the role of physical therapists' self-reported competence in managing a patient has not been tested previously in chronic LBP practice.

The objectives of this study were to: test the agreement between therapists' intuitive allocation of patients into risk stratification groups and patient allocation based on SBT scores, test correlations between physical therapists' intuitive psychological assessment and scores of patient questionnaires, and explore the influence of patients' psychological factors on physical therapists' self-reported competence to manage each patient with chronic LBP.

Materials and Methods

This study was a pragmatic, observational study approved by the local regional ethics committee (KEK-ZH-Nr: 2014-0533). Patients and therapists signed informed consent prior to study commencement.

Patient Recruitment and Allocation

Patients with LBP were recruited consecutively from a waiting list for musculoskeletal physical therapy at the Kantonsspital Winterthur, a public hospital in Switzerland. Patient recruitment was based on the clinical information reported on the referral sheet for physical therapy. Included patients were scheduled randomly to therapists who participated in this study. The first author (E.B.) met recruited patients prior to the intake session to screen for eligibility.

Participants

Patients with chronic LBP were included for participation. Inclusion criteria were: age between 18 and 65 years, history of LBP for more than 3 months, the primary pain area localized in the lumbar spine (T12 to buttocks), and being able to complete the questionnaires independently in the German language. Exclusion criteria were: pregnancy, rheumatic diseases, progressive neurological diseases, unstable cardiac or pulmonary conditions, red flag disorders such as cancer, fracture, infection or spinal cord compression/cauda equina syndrome, surgery during the last 3 months or planned surgery. Finally, patients with a diagnosed mental illness (based on DSM-5 criteria[30]) reported on their referral sheet for physical therapy were excluded, however patients who reported psychological factors remained eligible.

Therapists were graduated physical therapists or physical therapist students doing an internship for 3 or 5 months at the hospital. The physical therapist students were in their fourth or fifth semester of an 8-semester bachelors of science degree program from 2 different universities in Switzerland. There were no exclusion criteria for therapists.

Therapist Instruction Prior to Data Collection

All therapists were introduced to the purpose and background of the study prior to data collection. This 30-minute information session was given according to a self-developed standard operating procedure. Therapists were informed that the study aimed to examine how well physical therapists recognise psychological factors in patients with LBP. Additionally, the information for therapists included a brief introduction to the fear-avoidance model,[6] and information on the aims and the factor construct of the SBT,[12,31] the 4DSQ,[14] and the TSK.[32,33] All therapists were familiarized with questions of each instrument and received copies of the questionnaires.

Procedure

Patients completed all questionnaires during the meeting prior to the intake session. Management of the patients was at the therapist's discretion, while the scores from the patient questionnaires were not presented to the participating therapists. After the intake session, which often includes assessment and treatment, therapists completed questionnaires for each patient measuring their intuitive risk stratification, assessment of psychological factors, and their own self-reported competence to manage each patient.

Therapist Questionnaire

Therapists were asked the following question to allocate patients in prognostic risk groups (translated from German): "How do you estimate the risk that the patient will have persistent functional limitations in one year?" Therapists had to choose 1 of the 3 response categories (1

= low, 2 = medium, or 3 = high). Furthermore, therapists rated on a numeric rating scale (0 = not at all, 10 = very strong) their perceptions regarding patient distress, depression, anxiety and kinesiophobia. Somatization was not evaluated by the therapists. They also had the option to choose "cannot judge." Finally, for measuring therapists' self-reported competence, therapists were asked to rate their perceived competence to manage the patient (0 = not competent, 10 = very competent).

Patient Questionnaires

A range of questionnaires were administered to patients. The numeric rating scale (range = 0–10) measured average pain intensity over the last week, while the German version of the Roland-Morris Disability Questionnaire (RMDQ) measured back-specific function.[34] The German version of the SBT was chosen to measure the risk of chronicity.[35] The 50-item German 4Dimensional Symptom Questionnaire (4DSQ) was chosen to measure distress, depression, anxiety and somatization.[14] The 4DSQ has been shown as a valid tool to detect depression and anxiety disorders in general practice patients.[36] Kinesiophobia was measured with the German version of the 17-item Tampa Scale of Kinesiophobia (TSK).[32]

Data Analysis

Risk stratification. Intraclass correlation coefficients, based on a one-way random model [ICC(1.1)], were used to estimate the degree of agreement among therapists' intuitive patient allocation into risk stratification groups and allocation based on SBT scores.

Assessment of psychological factors. Spearman's rho correlation coefficients were calculated to test correlations between therapist perceptions and scores of formal screening questionnaires for distress, depression, anxiety and kinesiophobia. Additionally, Spearman's rho correlation coefficients were used to test associations between patient questionnaires. Correlations were interpreted in line with recommendations (<0.25 = little or no relationship; 0.25-0.49 = fair relationship; 0.50-0.74 = moderate to good; >0.75 = good to excellent).[37] Correlations between therapist perceptions and patient questionnaires were calculated for the total sample of therapists and separately for therapist subgroups (graduated physical therapists versus students). Differences between 2 independent correlations were calculated to compare therapist subgroups. Simple Interactive Statistical Analysis (SISA) (www.quantitativeskills.com/sisa/statistics/corrhlp.htm) was used for the comparison of correlations.

Therapists' self-reported competence. A linear mixed model was calculated to estimate the effect of patient-reported distress and kinesiophobia on therapists' self-reported competence to manage the patient, while controlling for the status of the therapist (student or graduated physical therapist).

$$Y_{ij} = \beta_0 + \beta_1(PT\_status) + \beta_2(Kinesiophobia) + \beta_3(Distress) + u_i + \varepsilon_{ij}$$

Y_{ij} refers to i-th observation of therapist's self-reported competence to manage the j-it patient. The dependent variable (Y_{ij}) was predicted by a fixed intercept (β_0), as well as therapist's status (β_1), patient score of the TSK (β_2) and patient score of the 4DSQ distress scale (β_3). A random intercept unique to each therapist (u_i), and a residual term (ε_{ij}) were added. The random intercept (u_i) considers the correlation structure of the data due to the repeated measurements of therapists. The restricted maximum likelihood (REML) method was used to estimate the parameters. For the linear mixed model, only patient-reported distress and

kinesiophobia were selected as predictor variables, because these variables refer to different psychological constructs, while distress was expected to be correlated with depression and anxiety.[14] Statistical analyses were performed with SPSS (v 24; IBM Analytics, Armonk, New York).

Results

Characteristics of Participants

Ninety-seven patients with LBP were screened. From this group of patients, 48 refused to participate or were excluded, leaving 49 eligible patients with chronic LBP. Patient characteristics are presented in Table 1. Patients' mean (SD) age was 47.08 (12.51) years. Most patients (38.8%) reported pain lasting between 1 and 3 years. Nine patients (18.4%) were at high risk, 16 (32.6%) were at medium risk, and 24 (49.0%) were at low risk according to the SBT. Moderate correlations were found between the SBT total scores and the TSK scores (r = 0.586), and between the SBT and 4DSQ scales for distress (r = 0.630), depression (r = 0.430) and anxiety (r = 0.498). Only fair correlations were found between the TSK and the 4DSQ scales for distress (r = 0.252), depression (r = 0.325) and anxiety (r = 0.129). Furthermore, there were moderate correlations between the 4DSQ distress and depression scales (r =0.564) and between the distress and anxiety scales (r = 0.663), with only fair correlations between the 4DSQ depression and anxiety scales (r = 0.425).

Included patients (N=49) were managed by 20 different therapists. The number of patients seen per therapist varied from 1 to 8. The total sample of therapists included 11 graduated physical therapists and 9 students. Graduated physical therapists managed 39 patient and

students 10 patients. Physical therapist and student characteristics are presented in Table 2. There was a significant difference in age between graduated physical therapists and students (mean difference = 5.83; t (18) = 3.333, 95% CI = 2.16 to 9.50; *P* = .004).

Risk Stratification

The degree of agreement between therapists' patient allocation and SBT allocation was poor [ICC(1.1): 0.305 (95% CI = 0.030, 0.537)]. Perfect agreement occurred in 20 out of 49 cases (agreement: 40.8%). Table 3 provides an overview of therapist (graduated physical therapists and students) patient allocation and allocation based on scores of the SBT. The SBT identified 24 patients (49.0%) as low risk, but therapists allocated only 10 patients (20.4%) to the low-risk subgroup. Interestingly, agreement between therapist allocation and SBT allocation was stronger in the student subgroup (agreement: 70%; ICC = 0.679, 0.160 - 0.908) than for the graduated physical therapist subgroup (agreement 33.3%; ICC = 0.220, -0.096 - 0.497).

Assessment of Psychological Factors

Correlations between therapists' intuitive psychological assessment and patients' questionnaires for the total group of therapists (graduated physical therapists and students) are shown in Table 4. Correlations between therapist perceptions and patient psychological status were moderate for distress (r = 0.602), fair for depression (r = 0.304) and anxiety (r = 0.327), while there was no correlation for kinesiophobia (r = -0.007). While the correlations between therapist perceptions and questionnaires did not differ to a statistically significant degree between the 2 therapist subgroups (graduated physical therapists and students), it is interesting that students' perceptions of depression were more highly correlated with the

patient questionnaire (r = 0.717) than graduated physical therapists' perceptions (r = 0.248).

For distress, depression, anxiety and kinesiophobia, therapists had the option to report

'cannot judge' when they felt unable to judge. This option was most often chosen for the

domain depression (N=11), but rarely for other domains.

Therapists' Self-Reported Competence

Therapists' self-reported competence to manage patients was high (mean ± SD = 7.18±2.06).

Table 5 shows that patient-reported distress was a significant predictor of therapists' self-

reported competence (estimated β = -0.137, SE = 0.031, t = -4.476, 95% CI for β = -0.199 to -

0.075), after controlling for the therapist status (student or graduated physical therapist). This

indicates a negative relationship between patient-reported distress and therapist self-reported

competence in managing patients with chronic LBP. Furthermore, therapist's status was

identified as a weak positive predictor of competence (estimated β = 1.262, SE = 0.651, t =

1.940, 95% CI for β = -0.072 to 2.597), indicating that graduated physical therapists rated

themselves more competent in the management of their patients than students, but this was

not statistically significant.

Discussion

These results reinforce the hypothesis that physical therapists and physical therapist students

have difficulty stratifying patients into risk stratification groups and identifying psychological

factors without any formal screening questionnaires. Physical therapists' intuitive allocation

into risk stratification groups agreed in only 41% of the cases with the allocation based on the

SBT scores. Furthermore, only a moderate correlation was found between therapists' perception of distress and patient reported distress on questionnaires, while correlations between therapists' clinical intuition and questionnaires for other psychological domains were only fair or worse. Finally, patient-reported distress was a negative predictor for therapists' self-reported competence to manage patients with chronic LBP, highlighting that such patients are deemed a challenge by physical therapists.

The results from our study on the agreement between therapists' intuitive patient allocation and SBT allocation are in line with previous results.[19] Corresponding to our study, Hill et al[19] found that agreement between clinical experts' patient allocation into risk stratification groups and allocation based on scores of the SBT occurred in only 47% of cases. Hill et al[19] showed video recordings of clinical assessment to clinical experts and asked them to allocate the seen patients into risk stratification groups. Patient videos, similar to clinical vignettes,[20] may not be sufficient to capture the complexity of the psychological assessment in real clinical practice, because therapists are not challenged to actively explore patients' emotions and beliefs. Furthermore, our study showed that therapists were more pessimistic regarding patient risk than the screening instrument. Therapists allocated more patients to the medium-risk or high-risk group than the SBT, as previously seen in the study by Hill et al.[19] Overall, results from our more pragmatic clinical observational study confirm previous results on therapists' intuitive allocation into risk stratification groups.

Our results regarding therapists' intuitive assessment of psychological factors showed that the correlation between therapists' intuitive perception of patient distress and patient-reported distress was moderate, but relationships were weaker in the domains of depression, anxiety and kinesiophobia. These results are mostly consistent with findings from previous studies.[21-23]

In the study of Beales et al,[22] the correlation between therapists' perceptions of distress and scores of patient questionnaires was only fair. The relationship found in our study was stronger, but this difference in correlations (0.60 vs. 0.33) may not be meaningful. Furthermore, our results for depression and anxiety are concordant with reported difficulties of physicians and therapists to screen for these symptoms.[23,38] Similar to previous studies,[21,22] no correlation was found between physical therapists' intuitive perception of kinesiophobia and patient scores on the TSK. Previous studies asked physical therapists for their perception of patients fear and compared therapists' rating with patient scores on the Fear-Avoidance Beliefs Questionnaire,[21] or with 1 item of the Örebro Musculoskeletal Pain Screening Questionnaire.[22] The TSK and the Fear-Avoidance Beliefs Questionnaire are based on different constructs, but moderate correlations have been found between the 2 measures.[13] However, despite differences in the specific screening questionnaires used between studies, considerable evidence now exists regarding therapists' difficulty in identifying symptoms of distress, depression, anxiety and kinesiophobia without screening questionnaires.

Intriguingly, students performed somewhat better than graduated physical therapists at allocating patients into risk stratification groups and were more accurate at identifying symptoms of depression as reported by patients on the questionnaire. None of the differences in correlations between graduated physical therapists and students in terms of their ability for psychological assessment reached statistical significance. Nevertheless, our preliminary findings are interesting and worth exploring further. This trend towards better results in students is in contrast with Beales et al,[22] who found stronger correlations between therapist's perceptions and patient-reported depression, anxiety and fear in more experienced physical therapists. In this context, it is possible that the patients themselves, and students, did not recognise or acknowledge psychological factors which were actually present but not captured by patients' questionnaires, whereas graduated physical therapists were more skilled at

identifying these features. The accuracy of patient questionnaires in this study cannot be evaluated. However, 4DSQ scores from our study are marginally higher than those found in another study on patients with sub-acute neck pain in physical therapist practice,[39] which might be explained by the more persistent pain experienced by patients included in our study.

Differences between graduated physical therapists and students found in our study may also relate to education. It is possible that present-day students have received more courses on psychology and on psychological factors associated with musculoskeletal pain than former students. Neverthless, it is doubtful that education alone explains the partial superiority of students in our study, because most physical therapists graduated within the last 5 years with a bachelor of science in physical therapy, which is the same education level of current students. However, an analysis of the curricula of these education programs was beyond the scope of this study. Another hypothesised explanation may relate to the physical therapists' clinical behaviour being influenced by their busy work setting. Compared to students, graduated physical therapists may tend to provide less time and space for patients to express unpleasant emotions and negative thoughts about their pain problem. Research on different groups of therapists may help to better understand how education, clinical experience, training and different clinical settings influence therapists' behaviour, as well as treatment outcomes.

The analysis on the relationship between patient-reported distress and therapists' self-reported expertise identified patient-reported distress as a significant negative predictor of therapists' self-reported competence to manage the patient. The linear-mixed model estimated that an increase of 1 unit on the distress scale (range: 0 – 32) resulted in a decrease by 0.137 unit in therapist's self-reported competence (scale from 0 to 10). Consequently, the

model estimates that therapists experience themselves as 40% less competent when managing maximally distressed patients then when managing patients without distress. This relationship is remarkable, since therapists' self-reported ratings can be influenced by a social desirability bias, or the tendency of respondents to answer in a manner that will be viewed favourably by others.[40] This potential bias could have resulted in an over-reporting of 'good behaviour', with an overestimation of their competence. Our results confirm findings from recent qualitative research showing that physical therapists often feel unprepared to treat patients with dominant psychosocial factors.[25,26,41,42]

Limitations

Study design. It must be acknowledged that the data was measured only at the intake session. The study could not capture how therapists' perceptions evolved over the course of ongoing treatment. This limitation may result in an underestimation of physical therapists' ability to risk stratify, or assess psychological factors. It could also be premature to measure therapists' self-reported competence after the intake session. Additionally, our study cannot evaluate the prognostic accuracy of therapist intuition or the SBT because of the lack of direct measures of chronicity. Furthermore, we used the SBT as a risk stratification instrument in physical therapist practice, but it has been noted that the SBT may perform better in general practice than in physical therapy or chiropractic settings.[43-45]

External validity. This study was conducted at only one specific clinical setting, limiting the generalisability of the findings. Furthermore, patients were excluded when diagnosed mental illnesses were mentioned on their referral sheet for physical therapy. The decision to exclude

these patients was based on our experience that mental illnesses are very often not sufficiently reported on these referral sheets. Therefore, we expected that unreliable reports of mental illness would bias our estimates on therapists' ability to recognize psychological factors. However, this exclusion criteria impacts the generalizability of our results to actual clinical practice where the prevalence of co-morbid mental illness is high in patients with chronic LBP.

Therapist instructions. The information given to therapists prior to data collection could also have biased their clinical behaviour. We aimed to diminish this potential limitation by providing only brief general information regarding the objective of the study. No information was given regarding our interest in therapists' self-reported competence. While the information given to therapists prior to data collection could have influenced their assessment of psychological factors, it is unlikely that this biased their self-reported competence.

Study sample. The included therapists managed small, and unequal, numbers of patients. Linear-mixed models handle unequal variances, but comparisons between students and physical therapists were limited due to the small sample size. Another limitation was the homogeneity among graduated physical therapists in terms of their age and experience in managing LBP. The sample size of 49 patients was adequate for testing correlations between therapists' perception and screening questionnaires. However, larger sample sizes would justify inclusion of more predictor variables in the linear-mixed model.

Data analysis. Patient-reported depression and anxiety were not included as independent variables in the linear mixed model for therapists' self-reported competence. The selection of

distress as a predictor was justified by established moderate correlations between the 4DSQ

scales of distress, depression and anxiety. Patients with clinically relevant depression and

anxiety disorders are therefore also likely to score high on the distress scale, and relationships

found between patient distress and therapist self-reported competence may also exist for

depression and anxiety.

Notwithstanding these limitations, strengths of this study include this being the first

observational study in a real clinical setting testing physical therapists' and students' ability to

allocate patients into risk stratification groups based on the concept of the SBT. Furthermore,

this is the first study providing empirical evidence for negative relationships between patient-

reported distress and therapist's self-reported competence in physical therapist practice for

chronic LBP.

Implications

Our findings support the claim that physical therapists should receive sufficient psychological

training to embed psychological perspectives in their clinical practice.[46] High-quality education

courses on psychological and psychiatric features might help prepare physical therapists for

their challenges in clinical practice and to improve health care services for patients with

chronic LBP, particularly for those patients with high psychological distress. Future research

should examine the influence of therapists' self-reported competence in practice on patient-

therapist alliance and treatment outcomes.

Physical therapists were not very accurate at allocating patients into risk stratification groups or identifying psychological factors, especially depression, anxiety and kinesiophobia. Patient-reported distress is a negative predictor of therapist self-reported competence in chronic LBP practice.

Disclosures

The authors completed the ICJME Form for Disclosure of Potential Conflicts of Interest and reported no conflicts of interest.

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Table 1. Patient Characteristics (N = 49)[a]

Characteristic	Value
Sex (female), n (%)	25 (51.0%)
Age, mean (SD)	47.08 (12.51)
Born in Switzerland (yes), n (%)	29 (59.2%)
Currently sick listed for LBP (yes), n (%)	12 (24.5%)
Duration of the current LBP problem, n (%)	
• 3 -12 months	17 (34.7%)
• 1 – 3 years	19 (38.8%)
• > 3 years	13 (26.5%)
Pain intensity (NRS, range = 0-10), mean (SD)	5.14 (2.32)
RMDQ, (range = 0-24), mean (SD)	9.49 (6.82)
SBT total score (range = 0-9), mean (SD)	4.10 (2.30)
SBT subgroups, n (%)	
• Low risk	24 (49.0%)
• Medium risk	16 (32.6%)
• High risk	9 (18.4%)
4DSQ distress scale (range = 0-32), mean (SD)	10.59 (7.98)
4DSQ depression scale (range = 0-12), mean (SD)	1.47 (2.67)
4DSQ anxiety scale (range = 0-24), mean (SD)	2.10 (3.65)
4DSQ somatization scale (range = 0-32), mean (SD)	10.49 (5.65)
TSK (range = 17-68), mean (SD)	34.65 (9.38)

Table 2.

Physical Therapist and Physical Therapist Student Characteristics (N = 20)[a]

Characteristics	Physical Therapists	Physical Therapist Students[b]
Sample size, n	11	9
Sex (female), n (%)	7 (63.6%)	7 (77.8%)
Age, mean (SD)	29.27 (4.56)	23.44 (2.83)
Highest education in physical therapy, n (%)		
• College of professional education	3 (27.3%)	N/A
• Bachelor of science in physical therapy	8 (72.7%)	N/A
Frequency of patients with LBP in their clinic		
At least 1 patient/day, n (%)	8 (72.7%)	1 (11.1%)
< 1 patient/day, n (%)	3 (27.3%)	8 (88.9%)
Postgraduate training in LBP management		
• Manual therapy, n (%)	7 (63.6%)	N/A
• No postgraduate training, n (%)	4 (36.4%)	N/A
Years since graduation, mean (SD)	3.37 (3.47)	N/A
Years of LBP work experience, mean (SD)	2.05 (2.69)	0
[a] LBP = low back pain; N/A = not applicable. [b] Students in the fourth or fifth semester of an 8-semester bachelor of science degree program in Switzerland.		

Table 3.

Cross Tabulation of Therapists' Intuitive Patient Allocation Into Risk Stratification Groups and

Patient Allocation Based on SBT Scores [a]

	SBT Allocation			
	Low	**Medium**	**High**	**Total**
Therapist allocation				
Low	9	1	0	10
Medium	11	7	5	23
High	4	8	4	16
Total	24	16	9	49

[a] Graduated physical therapists and physical therapist students. SBT = STarT Back Tool. Cases with perfect agreement = 20 (40.8%).

Table 4.

Spearman Rank Correlation Between Therapists'[a] Perception and Formal Screening Questionnaires on the Presence of Distress, Depression, Anxiety, and Kinesiophobia Among Patients With LBP

Domain	Therapist Perception	Patient Questionnaire	N	R	95% CI
Distress	To what extent do you recognize signs of psychological distress? (NRS, 0 - 10)	4DSQ, distress scale (0 – 32 scale)	45	0.602[b]	0.337, 0.784
Depression	To what extent do you recognize signs of depression? (NRS, 0 - 10)	4DSQ, depression scale (0 – 12 scale)	38	0.304	-0.067, 0.598
Anxiety	To what extent do you recognize signs of anxiety? (NRS, 0 - 10)	4DSQ, anxiety scale (0 – 24 scale)	47	0.327[c]	0.034, 0.574
Kinesiophobia	To what extent do you recognize signs of kinesiophobia? (NRS, 0 - 10)	TSK, total score (17 – 68 scale)	45	-0.007	-0.301, 0.311

[a] Graduated physical therapists and physical therapist students. LBP = low back pain; N = number of cases included for analysis (potential exclusions due to rating "cannot judge"); NRS = Numeric Rating Scale (0 = not at all, 10 = very strong); R=Spearman rank correlation coefficient; TSK = Tampa Scale of Kinesiophobia; 4DSQ = Four-Dimensional Symptom Questionnaire; 95% CI = 95% confidence interval, with bootstrap.

[b] $P < .01$ (2-tailed).

[c] $P < .05$ (2-tailed).

Table 5. Linear Mixed Model for Therapists' Self-Reported Competence to Manage the Patient With Chronic LBP [a]				
Parameter	**Estimate**	**SE**	***t* Value**	**95% CI**
Intercept, β_0	9.301[b]	0.962	9.66	7.361, 11.241
PT_status (reference: student), β_1	1.262	0.651	1.940	-0.072, 2.597
Kinesiophobia, β_2	-0.050	0.027	-1.890	-0.104, 0.003
Distress, β_3	-0.137[b]	0.031	-4.476	-0.199, -0.075
Random effects:				
Between-therapist variance	0.416	0.504		
Residual variance	2.293	0.579		

[a] Graduated physical therapists and physical therapist students. Estimate = estimated fixed effects; SE = standard error; LBP=low back pain; PT_status = student, physical therapist; 95% CI= 95% confidence interval of estimated effect.

[b] $P < .01$.