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PROFESSIONAL THEORETICAL ARTICLE

Validity and reliability of Turkish version of the Pain Attitudes and Beliefs Scale for Physiotherapists

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Abstract

Background: The initial purpose of this study was to perform a linguistic and cultural translation of the Pain Attitudes and Beliefs Scale for Physiotherapists into the Turkish language. Following the translation process the primary purpose of the study was to examine the validity and reliability of the Turkish version of Pain Attitudes and Beliefs Scale for Physiotherapists. *Materials and methods*: A survey study design was used. The Turkish version of Pain Attitudes and Beliefs Scale for Physiotherapists was developed. A pilot test was performed and a final version was completed. Participants were recruited to examine the reliability and validity of the new instrument. Participants received an online survey package with the PABS-PT-TR and Turkish Version of the Tampa Scale for Kinesiophobia. *Results*: A total of 51 physiotherapists (response rate 60.7%) completed the PABS-PT-TR and Turkish Version of the Tampa Scale for Kinesiophobia and 28 physiotherapists completed the retest. Factor analysis was conducted to determine the construct of the scale. Two factors emerged: one focused on biomedical orientation and the second on biopsychosocial orientation. The test–retest reliability (ICC) for the biomedical scale was 0.81 (95% CI = 0.60–0.91) and 0.82 (95% CI = 0.61–0.91) for the biopsychosocial scale. Internal consistency for the "biomedical" scale was Cronbach's $\alpha = 0.72$ and $\alpha = 0.59$ for the biopsychosocial scale. When the relationship between PABS-PT-TR and TSK was investigated, *r* value was 0.39 ($p < 0.05$) indicating fair convergent validity. These results indicated that the PABS-PT-TR shows construct validity. *Conclusion*: The PABS-PT-TR appears to have good test–retest reliability, acceptable to good internal consistency, and acceptable construct validity.

Keywords

Attitudes, beliefs, PABS-PT, pain, physiotherapists, Turkish

History

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Introduction

Two possible important physiotherapists' attitudes can be extracted from the literature. First of all, physiotherapists can derive their treatment orientation from the biomedical model of disease, based upon the notion that pain and disability are a consequence of physical pathology and the treatment will primarily be aimed at finding the physical pathology that is the cause of the pain and treating this pathology. The second source of physiotherapists' treatment orientation comes from the biopsychosocial model, where pain does not have to be a sign of pathology or tissue damage, but is also influenced by social and psychological factors. Because of these factors, disability due to pain can be prolonged after the initial pathology has healed (Lin et al, 2011; Lindstrom et al, 1992).

Several instruments are available to assess attitudes and beliefs of physiotherapists. The Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) was originally developed to determine physiotherapists attitudes and beliefs about pain, and was trialed on Dutch physiotherapists that were considered general practitioners (Ostelo et al, 2003).

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Ostelo et al. (2003) developed the PABS-PT to assess the strength of two possible orientations towards management of patients with chronic low back pain in physiotherapists. The PABS-PT was originally developed by reviewing existing questionnaires measuring patients' attitudes and beliefs towards chronic LBP and rephrased eight items from the Tampa Scale for Kinesiophobia (TSK) (Kori, Miller, and Todd, 1990); two from the Back Beliefs Questionnaire (BBQ) (Symonds, Burton, Tillotson, and Main, 1996); two from the Fear Avoidance Beliefs Questionnaire (FABQ) (Waddell et al, 1993); and added 19 items, devised by the authors, relevant to the management of LBP. An expert review of the items by experienced physiotherapists followed to check that the items were unambiguous and able to discriminate between the two treatment orientations. The resulting 31 item PABS-PT was completed by a sample of 421 physiotherapists in the Netherlands. Following exclusion of nine items, factor analysis resulted in a two factor solution. Of the two factors, the ''biomedical'' orientation consisted of 14 items and the ''behavioural'' orientation consisted of 6 items. A high score on the item ''Increased pain indicates new tissue damage or the spread of existing damage'', for example, indicates a biomedical orientation. On the other hand, agreeing with the item ''Mental stress can cause back pain even in the absence of tissue damage'' can be interpreted as a biopsychosocial orientation (Ostelo et al, 2003).

PABS-PT is available in English, French, Dutch, German and Brazilian–Portuguese since numerous studies on the psychometric properties of these instruments have been completed. In all versions of PABS-PT, factor analysis eventually resulted in a two factor solution: (1) biomedical orientation; and (2) behavioural orientation. Availability of the questionnaire in several languages facilitates universality of the results from clinical trials. Cultural differences in attitudes and beliefs may exist and hence comparison of health care practioners in different countries can be facilitated by the use of a core set of tools (Mutsaers et al, 2012).

The validity of PABS-PT has usually been tested by examining construct validity and involves correlation to pain or phobia instruments such as an adapted Tampa Scale for Kinesiophobia (TSK-HC) reworded for health care practitioners, BBQ or HC-PAIRS (Houben et al, 2005b). For the present study the TSK-HC was chosen since this instrument has been translated to Turkish, while the other possible instruments (i.e. BBQ and HC-PAIRS) have not. The Tampa Scale for Kinesiophobia (TSK) is designed to measure fear of movement or (re)injury in patients (Kori, Miller, and Todd, 1990), and was adapted to measure concerns of movement or (re)injury therapists have for their patients. The adapted TSK (TSK-HC) consisted of 17 items that had to be rated on a six-point Likert scale ranging from ''totally disagree'' to ''totally agree''. As an example, the original item ''If I were to try to overcome it, my pain would increase'' was adapted to read ''If a low back pain patient was to try to overcome his or her pain, it would increase''. A high score on the TSK-HC indicates a strong concern for the possibility of aggravating back pain through physical movement.

The reliability of PABS-PT has usually been tested by examining internal consistency of the instrument and test–retest reliability. Cronbach's α for the two dimensions in the original PABS-PT (Ostelo et al, 2003) was indicated to have satisfactory internal consistency. Later studies indicated good test–retest reliability (Laekeman, Sitter, and Basler, 2008; Magalhães, Costa, Ferreira, and Machado, 2011).

Although attitudes and beliefs of physiotherapists are known as factors that are likely to influence the outcomes observed in the treatment of patients with chronic low back pain, this research topic is emerging as important in Turkey. Up to now there has been no Turkish Assessment Method evaluating attitudes and beliefs towards painful musculoskeletal conditions in Turkish physiotherapists. The initial purpose of this study was to perform a linguistic and cultural translation of the Pain Attitudes and Beliefs Scale for Physiotherapists into the Turkish language. Following the translation process, the primary purpose of the study was to examine the validity and reliability of the Turkish version of Pain Attitudes and Beliefs Scale for Physiotherapists.

Methods

Participants

The study was approved by the Ethics Comittee of Fatih University. An announcement was posted electronically on the Network of the Turkish Physiotherapy Association inviting musculoskeletal PT's who worked with patients having low back pain to participate in a validity/reliability study. There were 105 responders, but when the inclusion criteria of at least 2 years practicing in the field was applied there were 84 total participants. Next the PABS-PT-TR and Turkish Version of Tampa Scale for Kinesiophobia were delivered to 84 physiotherapists via mail. The participants were informed about the study and approval was obtained before completion of the surveys. Response rate was 60% and the flowchart of the study is shown in Figure 1.

Assessment tools

The Pain Attitudes and Beliefs Scale for Physiotherapists

The original Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) was published in 2003 and consists of 31 items. Each item is scored on a six-point Likert scale that ranges from totally disagree (score 1) to totally agree (score 6). A high score on the first factor represents the conviction on the relationship between pain and structural damage, while a high score on the second factor indicates the absence of this relationship.

Turkish version of Tampa Scale for Kinesiphobia

The Tampa Scale for Kinesiophobia was originally developed in English and consists of 17 items for the assessment of excessive, irrational, and debilitating fear of physical movement/(re)injury in back pain patients (Miller, Kori, and Todd, 1991). We used the items of the Turkish version developed by Tunca Yılmaz, Yakut, Uygur, and Uluğ (2011) in a slightly different format. Whereas the original scale addressed patients, we addressed physiotherapists. We replaced the subject of each item using the term ''low back pain patient'' instead of ''I'' as suggested by Ostelo et al (2003).

Test–retest reliability of the Turkish version of the Tampa Scale for Kinesiophobia was found to be excellent. Each item is rated on a 6-point Likert Scale that ranges from total disagreement (score 1) to total agreement (score 6) (Tunca Yılmaz, Yakut, Uygur, and Uluğ, 2011). The total score ranges from 17 to 102 (Higher score = participants show greater fear of movement/reinjury regarding the patients).

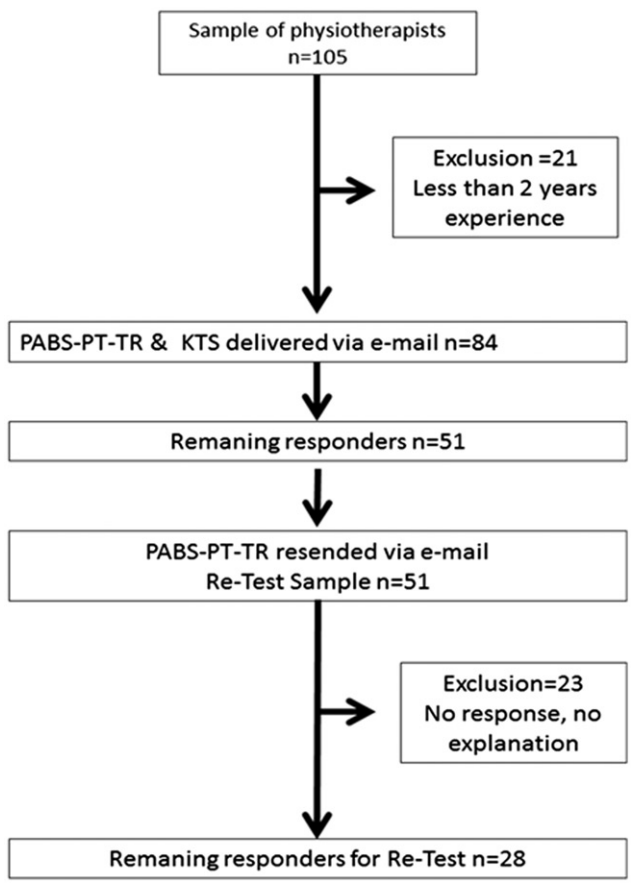

Figure 1. Flowchart of the study.

Procedure

Our study consisted of two stages and they were conducted at Fatih University, School of Physiotherapy. Best practice as recommended by translation guidelines was used (Beaton, Bombardier, Guillemin, and Ferraz, 2000; Bowey-Morris, Purcell-Jones, and Watson, 2010; Ware et al, 1995).

Linguistic and cultural translation

Linguistic and cross-cultural translation procedure is shown Figure 2.

Details of each step are explained below:

Step 1: Liaison with PABS-PT Developers

Contact was established via mail with Dr. Raymond Ostelo from the Institute for Health and Care Research, Netherlands. The purpose was to determine whether there were any attempts in progress to develop the Turkish version of the instrument.

Step 2: Translation (English to Turkish)

We established a translation team which consisted of: 2 bilingual physiotherapists; 2 native Turkish speaking physiotherapists; and 1 bilingual native English speaking teacher of the English language (5 total members on the translation team). The original PABS-PT was translated from English to Turkish independently and separately by the 4 physiotherapists after which the 4 translated Turkish versions were compared and a draft Turkish version was produced.

Step 3: Back Translation (Turkish to English)

A back translation of the draft Turkish version was then conducted by the fifth member of the team who was the bilingual native English speaking teacher of the English language, whose qualifications included a university degree in English. During the translation process, explanatory notes were also taken by this fifth member.

Step 4: Synthesis

The content of the original and reverse-translated English versions were compared, and differences were noted. The translation team reviewed all versions. The reviewers commented on the differences and a synthesis of these differences was created.

Step 5: Consensus Building

All materials including, the original English, Turkish and the reverse-translated English versions and synthesis of translation differences were discussed by the translation team. The translation team reached a consensus on PABS-PT Turkish regarding linguistic imprecision and cultural differences.

Step 6: Pilot Testing

A Turkish pilot version was converted to an online form and was delivered to 30 physiotherapists. The sample of 30 was taken from the Network of the Turkish Physiotherapy Association to determine acceptability and comprehensibility of the Turkish PABS- PT. In order to obtain the pilot testing sample went down the Network List every 3 names until we totaled 30 participants. Next we e-mailed our request and the pilot instrument to each individual. These participants were not involved in the larger study, they were an independent co-hort. In online form there was a question about clarity of scale. All of the participants responded that the scale was easy to understand.

Step 7: Development of the Final Version

Results were discussed with respondents and minor corrections were made. The final version of PABS-PT Turkish was produced and it is described in the Appendix.

Psychometric properties

Validity

The reference standard for convergent validity was the Turkish Version of the Tampa Scale for Kinsiophobia. Construct validity was examined by comparing PABS-PT-TR with the Turkish Version of the Tampa Scale for Kinsiophobia and by performing factor analysis to reflect dimensions regarding attitudes and beliefs for pain (Swinkels-Meewisse et al, 2003; Vlaeyen, Kole-Snijders, Boeren, and van Eek, 1995).

Reliability measures

For reliability, intraclass correlation coefficient (ICC) and Cronbach alpha coefficient (α) were calculated. For the test–retest reliability, PABS-PT-TR was performed 2 times. The period between measurements was 14 days. Test–retest reliability was determined by using intraclass correlation coefficient (ICC).

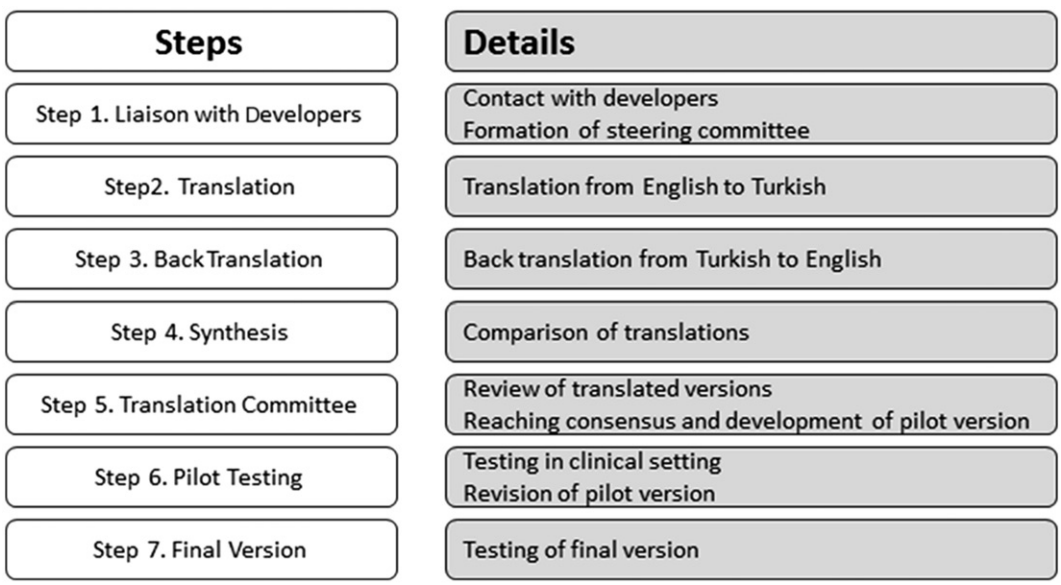

Figure 2. Linguistic and cross-cultural translation procedures.

Statistical analysis

The statistical analysis of the data was performed using SPSS (Statistical Package for the Social Sciences) for Windows 15.0 package program (Chicago, IL). Kolmogrov–Smirnov test was used to investigate normality of the distribution of the continuous variables. The descriptive statistics were given as the mean ± standard deviation or median (minimum-maximum) for the continuous variables and as number of patients and percent (%) for the categorical variables.

We followed the procedure suggested by Houben et al (2005a) for analysis of the data. Before examining the factor structure of the PABS-PT-TR, the psychometric properties of each item were analyzed. We excluded items for heterogeneity, if skewness exceeded ± 1. Other exclusion criteria were item loadings < 0.25 and negative loadings of the items. We performed a principal factor analysis with oblique rotation (Oblimin with Kaiser normalization) and list-wise deletion of cases. An analysis of the Eigen values using the Scree-test and a cut-off ≤ 1 served to determine the number of factors. Before the analysis, we calculated the Meyer–Olkin coefficient and the Bartlett test for sphericity.

Internal consistency was assessed using item to total correlation and Cronbach's alpha. Item to total correlation measures the strength of association between an item and the remainder of its scale using Pearson correlation and correlations of 0.4 or above are considered acceptable (Mokkink et al, 2010); however, it is suggested items show a moderate correlation of 0.7–0.9 to insure strong internal consistency (Portney and Watkins, 1993). Cronbach's alpha assesses the overall correlation between all items within a scale and values greater than or equal to 0.7 are considered acceptable (Nunnally and Bernstein, 1993).

For assessing test–retest reliability, the questionnaire was administered 2 times. Test–retest reliability was determined by using intraclass correlation coefficient (ICC). Test–retest reliability was calculated for both Factor 1 (Biomedical) and Factor 2 (biopsychosocial). ICCs can vary from 0.00 to 1.00 where values above 0.75 are regarded as evidence of good reliability, and those above 0.90 indicating excellent reliability to ensure reasonable validity (Portney and Watkins, 1993).

For construct validity, we examined convergent validity between PABS-PT-TR and the Turkish Version of Tampa Scale for Kinesiophobia and as described earlier factor analysis to reflect dimensions regarding attitudes and beliefs for pain. The relationship between the PABS-PT-TR and the Turkish Version of Tampa Scale for Kinesiophobia was evaluated with Pearson's correlation analysis with the probability error of $p < 0.05$. A correlation coefficient (r) of 0.75 and above is considered good to excellent; 0.50 to 0.75 as moderate to good; 0.25 to 0.50 as fair; and 0.00 to 0.25 as little to no relationship (Portney and Watkins, 1993).

Results

Table 1 shows descriptive data of the individuals included in the study. The participants were asked to indicate number of years in musculoskeletal physiotherapy practice, degree of qualification, and gender. Table 2 contains 17 items of the PABSPT-TR that had been excluded prior to factor analysis because of a skewed distribution.

Factor structure

The Kaiser–Meyer–Olkin coefficient (0.661) and the Bartlett test of sphericity (chi square = 174.97; $p < 0.001$) justified the factor analysis (Hayran and Hayran, 2011). The Eigen value > 1 criterion initially suggested four factors. Other studies including the original development study by Ostelo et al (2003) also found greater than a 2-factor solution. Employing principal factor analysis and the criterion of a eigenvalue > 1 Ostelo et al (2003) yielded 7 factors and Laekeman, Sitter, and Basler (2008) yielded 5 factors. However in both studies following scree test analysis 2 factors clearly remained. In the present study the scree test analysis (Figure 3) was not as clear to confirm a 2 factor solution, however since other researchers have found 2 factors, it was not of interest to further examine additional factors or dimensions.

Factor 1 (biomedical) explained 24.5% and Factor 2 (biopsychosocial) explained 14.0% of total variance, thus accounting for less than 40% of the explained variance. Factors 3 and 4 would explain an additional 17% of the variance (9.5% and 7.8%, respectively), but as indicated earlier, these were not of interest in this study. Inspection of the loadings gave reason to also eliminate item 7 because of a negative loading, leaving a total of 13 items. The extraction of two factors suggests the construction of two subscales, one of them consisting of 7 items, the other one of six items (Table 3). The first scale measures the conviction that pain is caused by tissue damage, which indicates a biomedical orientation. The second scale contains items that reflect the conviction that physical activity is advantageous, which is thought to be part of a biopsychosocial orientation in pain management (Ostelo et al, 2003).

Reliability

Internal consistency for the ''biomedical'' scale was Cronbach's $\alpha = 0.72$ and $\alpha = 0.59$ for the biopsychosocial scale. There was no item indicated to yield a raise in α after deleted. The ICC scores for test–retest reliability were 0.81 (95% CI = 0.60–0.91) for scale 1 and 0.82 (95% CI = 0.61–0.91) for scale 2. Table 4 contains the item to total correlation results showing the Pearson correlation for the 7 biomedical items and the 6 biopsychosocial items. All correlations are significant.

Validity

In the absence of a true gold standard to evaluate concurrent criterion-related validity for the pain attitudes and beliefs of physiotherapists, we evaluated construct validity by comparing the PABS-PT-TR with the Turkish Version of the Tampa Scale for Kinsiophobia (convergent validity) and by performing factor analysis to reflect dimensions regarding attitudes and beliefs for pain. When the relationship between the PABS-PT-TR (total scale) and TSK was investigated using Pearson correlation an r value of 0.39 was calculated indicating fair convergent validity, and correlations for the subscales for biomedical and biopsychosocial were 0.29 and −0.29, respectively, also considered fair convergent validity. These results combining factor analysis and convergent validity suggests that the PABS-PT-TR has acceptable construct validity.

Table 1. Demographic characteristics of participant.

Characteristics	*n*	%	Mean ± SD
Gender			
Male	20	39.2	
Female	31	60.8	
Number of years in musculoskeletal practice			10.10 ± 6.27 (2–34)
Degree of qualification			
BSc	32	62.8	
MSc	10	19.6	
PhD	9	17.6	

Discussion

This study demonstrated that the Turkish version of the PABS-PT has good psychometric properties, and can be used to determine treatment attitudes and beliefs of Turkish physiotherapists.

Adequate translation procedures have to be used to achieve cross-cultural equivalence when translating participant-reported outcome measures. The results of reliability and validity testing are in line with previous studies which show that our translation procedure was adequate (Beaton, Bombardier, Guillemin, and Ferraz, 2000).

Following factor analysis in the present and previous study items in the scale were always reduced. This item reduction has resulted in various versions from a maximum of: 20 items in the original development study in Dutch physical therapists (Ostelo et al, 2003); 19 items in a re-examination of the initial scale again examining Dutch physical therapy students (Houben et al, 2005a); 14 items in German physical therapists (Laekeman, Sitter, and Basler, 2008); and to a minimum of 13 items in Turkish physical therapists in the present study. In all studies there were more items in the biomedical subscale of the PABS-PT when compared to the biopsychosocial subscale. This may have occurred since several items reflected issues addressed in guidelines on chronic low back pain for physiotherapists. Chronic low back pain guidelines stress the importance of motivating the patient to resume normal activities as soon as possible, and convincing them that there is nothing dangerously wrong with their back. Therefore, scores on these items might have been indicative of therapists' knowledge of guidelines and the intention to comply with these, rather than their actual orientation and behaviour. So the vast majority of therapists either totally agreed or totally disagreed with these items and the number of items in the biopsychosocial subscale might be reduced and those in the biomedical subscale increased. Items included in both factors vary considerably between studies; most often between 14 and 19 items were left in the analysis. The initial item pool (31 items) of the PABS-PT by Ostelo et al (2003) generated the original interpretable 2-factor model. Of the two factors, the ''biomedical'' orientation consisted of 14 items and accounted for 25.2% of the variance and the ''behavioural'' orientation consisted of 6 items and accounted for 8.2% of the variance (Ostelo et al, 2003). In order to improve the internal consistency of the behavioral factor, Houben et al (2005a) added five items. Factor analysis confirmed the original biomedical/behavioral model and strengthened the behavioral factor. In this

Table 2. Distribution parameters of the items and reasons of item exclusion.

1	Back pain sufferers should refrain from all physical activity in order to avoid injury	A
2	Good posture prevents back pain	A
3	Knowledge of the tissue damage is not necessary for effective therapy	A
4	Reduction of daily physical exertion is a significant factor in treating back pain	A
5	Not enough effort is made to find the underlying organic causes of back pain	A
6	Mental stress can cause back pain even in the absence of tissue damage	A
7	The cause of back pain is unknown	B
8	Unilateral physical stress is not a cause of back pain	A
10	Pain is a nociceptive stimulus, indicating tissue damage	A
11	A patient suffering from severe back pain will benefit from physical exercise	A
16	The way patients view their pain influences the progress of the symptoms	A
18	Therapy can completely alleviate the functional symptoms caused by back pain	A
19	If ADL activities cause more back pain, this is not dangerous	A
21	Sport should not be recommended for patients with back pain	A
22	If back pain increases in severity, I immediately adjust the intensity of my treatment accordingly	A
26	It is the task of the physiotherapist to remove the cause of back pain	A
27	There is no effective treatment to eliminate back pain	A
29	Even if the pain has worsened, the intensity of the next treatment can be increased	A

Median P50 (50th precentile); P25, 25th percentile; P75, 75th percentile.
Exclusion criterion: A = skewness; B = negative loading.

Figure 3. Screeplot graphics.

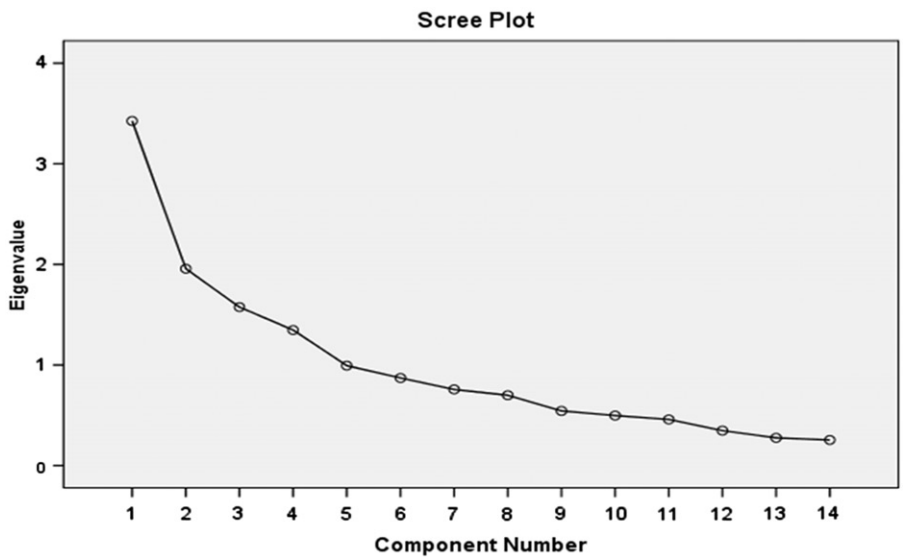

Table 3. Distribution parameters and factor loadings of the items included in the factor analysis ($n = 51$).

No	Item	Mean (SD)	F1[a] (biomedical subscale)	F2[b] (biopsychosocial subscale)	Mean (SD) F1	Mean (SD) F2
9	Patients who have suffered back pain should avoid activities that stress the back	4.49 (1.21)	0.38*		30.63 (5.43)	20.59 (5.09)
14	Patients with back pain should preferably practice only pain free movements	4.39 (1.20)	0.45*			
23	If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term	4.61 (1.18)	0.71*			
24	Pain reduction is a precondition for the restoration of normal functioning	5.14 (0.85)	0.79*			
25	Increased pain indicates new tissue damage or the spread of existing damage	3.80 (1.40)	0.59*			
28	TENS and/or back braces support functional recovery	4.10 (1.46)	0.46*			
31	The severity of tissue damage determines the level of pain	4.10 (1.45)	0.68*			
12	Functional limitations associated with back pain are the result of psychosocial factors	3.33 (1.47)		0.50*		
13	The best advice for back pain is: ''Take care'' and ''Make no unnecessary movements''	3.25 (1.53)		0.57*		
15	Back pain indicates that there is something dangerously wrong with the back	3.33 (1.52)		0.69*		
17	Therapy may have been successful even if pain remains	2.75 (1.50)		0.49*		
20	Back pain indicates the presence of organic injury	3.61 (1.37)		0.71*		
30	If patients complain of pain during exercise, I worry that damage is being caused	4.31 (1.49)		0.38*		

SD, standard deviation; F1, loading on factor 1; F2, loading on factor 2.
[a,b]Item loadings are presented in declining sequence (respective for the 7 items of factor 1 and the 6 items of factor 2).
*Significant item loading.

Table 4. The item to total correlation results showing the Pearson correlation for the 7 biomedical items and the 6 biopsychosocial items.

No	Item	F1 (biomedical subscale) Pearson correlation coefficient (r) Item to total correlation	F2 (biopsychosocial subscale) Pearson correlation coefficient (r) Item to total correlation
9	Patients who have suffered back pain should avoid activities that stress the back	0.44*	
14	Patients with back pain should preferably practice only pain free movements	0.49*	
23	If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term	0.70*	
24	Pain reduction is a precondition for the restoration of normal functioning	0.78*	
25	Increased pain indicates new tissue damage or the spread of existing damage	0.64*	
28	TENS and/or back braces support functional recovery	0.48*	
31	The severity of tissue damage determines the level of pain	0.78*	
12	Functional limitations associated with back pain are the result of psychosocial factors		0.56*
13	The best advice for back pain is: ''Take care'' and ''Make no unnecessary movements''		0.53*
15	Back pain indicates that there is something dangerously wrong with the back		0.66*
17	Therapy may have been successful even if pain remains		0.53*
20	Back pain indicates the presence of organic injury		0.67*
30	If patients complain of pain during exercise, I worry that damage is being caused		0.50*

*Significant item to total correlation.

re-examination study the biomedical orientation consisted of 10 items and accounted for 23.4% of the variance and the biopsychosocial orientation consisted of 9 items and accounted for 10.0% of the variance (Houben et al, 2005a). Studies that translated the original or the modification to another language resulted in the following findings. The German translation by Laekeman, Sitter, and Basler (2008) resulted in a 10-item biomedical scale accounting for 21.5% of the variance and a 4-item biopsychosocial scale accounting for only 3.6% of the variance. The Brazilian translation used the Houben et al (2005a) 19-item scale without further factor analysis and thus no additional data was added regarding variance explanation. In all studies where variance was evaluated, the biomedical subscale of PABS-PT always explained the greater amount when compared to

the biopsychosocial subscale. This may be due to the smaller number of items in the biopsychosocial subscale. The present study was similar to the German study (Laekeman, Sitter, and Basler, 2008) in overall number of items in the final instrument (13 versus 14), but yielded far fewer biomedical items and conversely more biopsychosocial items. In fact, the present study had the lowest total number of items in the biomedical scale. In literature, items included in both factors vary considerably between studies. The reason for the variability of factor items across studies might be that the PABS-PT is still in developmental stage. In proportion to items in each scale the present study was most similar to the Houben et al (2005a) and Magalhaes, Costa, Ferriera, and Machado study basically having a 50/50 distribution of items in each scale. In regards to variance explained by the factor analysis the present study explained the highest total (38.4%) and although there were only 6 items in the biopsychosocial scale, these items explained 14.0%, again the highest in all current studies. In Turkey, physiotherapy training is more biomedical. But in recent years, the biopsychosocial model has been advocated by guidelines, and the biopsychosocial model has recently gained much attention among physiotherapists. The result of these recent changes may be that treatment orientation of physiotherapists may be shifting towards to behavioural perspective. Also Magalhães, Costa, Cabral, and Machado (2012) reported that gender was significantly associated with the PABS-PT biomedical subscale. In their study males had a biomedical orientation. In our study, the number of female physiotherapists was more than male. This factor may have affected the variance.

In our study, reliability determined by internal consistency was measured as Cronbach's α values. Cronbach's α assesses the overall correlation between items within a scale. Our Cronbach's α coefficients were 0.72 for the biomedical scale and 0.59 for the biopsychosocial subscale and were accepted as good reliability for the biomedical scale and acceptable for the biopsychosocial subscale. Our results are similar to the results of all studies performed previously. Ostelo et al (2003) observed a Cronbach's alpha value of 0.84 for the biomedical subscale and 0.54 for the biopsychosocial subscale; Houben et al (2005a) observed a Cronbach's alpha value of 0.73 for the biomedical subscale and 0.68 for the biopsychosocial subscale; Laekeman, Sitter, and Basler (2008) observed a Cronbach's alpha value of 0.77 for the biomedical subscale and a 0.58 for the biopsychosocial subscale; and Magalhaes, Costa, Ferriera, and Machado (2011) observed a Cronbach's alpha value of 0.74 for the biomedical subscale and 0.67 for the biopsychosocial subscale.

In all studies where the internal consistency of PABS-PT was evaluated, the biomedical subscale of PABS-PT was always higher when compared to the biopsychosocial subscale. The slightly lower values of the α with the biopsychosocial scale are probably due to the reduced number of items and cultural differences.

For test–retest reliability ICCs can vary from 0.00 to 1.00 where values of 0.60 to 0.80 are regarded as evidence of good reliability with those above 0.80 indicating excellent reliability. In our study, ICCs were above 0.80 for each scale and accepted as excellent reliability. We observed an ICC of 0.81 (95% CI = 0.60–0.91) for the biomedical subscale and 0.82 (95% CI = 0.61–0.91) for the biopsychosocial subscale. The high test–tetest reliability could be related to the strong procedures that were employed in the translation and checking for clarity process used in our study. Similar ICC estimates were observed in the studies by Laekeman, Sitter, and Basler (2008) (0.83 for the biomedical subscale and 0.70 for the biopsychosocial subscale); and Magalhaes, Costa, Ferriera, and Machado (2011) (0.80 for the biomedical subscale and 0.70 for the biopsychosocial subscale).

The HC-PAIRS and the TSK-HC are questionnaires that assess the health care providers' attitudes toward pain and impairment relations and movement and (re)injury, respectively. Validity of the questionnaire in this study is supported by correlation analyses with Tampa Scale for Kinesiophobia that measures similar concepts. The relation between PABS-PT-TR and TSK was acceptable ($r = 0.29$ for biomedical and $r = -0.29$ for biopsychosocial). Studies that were translated from the original PABS (Ostelo et al, 2003) or modified PABS (Houben et al, 2005a) to different languages had very different results when examining construct validity. Laekeman, Sitter, and Basler (2008) in the German translation observed a Pearson correlation value of 0.72 for the biomedical subscale and a -0.54 for the biopsychosocial subscale when compared to the TSK; and Magalhaes, Costa, Ferriera, and Machado (2011) in the Brazilian–Portuguese translation observed a Pearson correlation value of 0.28 for the biomedical subscale and 0.19 for the biopsychosocial subscale when compared to the HC-PAIRS. Houben et al (2005a) also examined construct validity for the PABS compared to both the TKS and HC-PAIRS and found Pearson correlations of 0.79 for the biomedical subscale and 0.39 for the biopsychosocial subscale; and correlations of 0.34 for the biomedical subscale and -0.20 for the biopsychosocial subscale, respectively. A possible explanation for the disparity of construct validity between European and other countries (Turkey and Brazil) is that in European countries, most biopsychosocial theories/treatments have been developed and the biopsychosocial model has been incorporated more thoroughly among healthcare providers.

There are some limitations of our study. Although our sample size was enough to deduce statistically significant comparisons, it could have been larger, and the response rate, though acceptable, was only 60%. Another limitation is the small number of items found suitable to represent the biopsychosocial subscale. Yet, another limitation concerns the fact that the TSK-TR has only been examined for test–retest reliability and other psychometric properties of this adapted measure have not been studied. An additional limitation to our study is that two factors explained only 40% of the total variance, and additional variances were not considered. However in the literature, only two factors were indicated and in other studies accounted for less than 35%. There are advantages of our study. For the first time in Turkey, a specially developed questionnaire was used to evaluate physiotherapist attitudes and beliefs. Also rigorous procedures were employed in the translation and examination of clinimetric properties. In conclusion the findings suggest that the PABS-PT-TR appears to have good test–retest reliability, acceptable to good internal consistency, and acceptable construct validity.

Declaration of interest

The authors report no conflict of interest.

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Appendix – The Turkish version of PABS-PT

Fizyoterapistlerin bel ağrısı ile ilgili inanç ve tutumları anketi (PABS-PT-TR)

1. Bel ağrısı yaşamış kişiler bel bölgesine stres bindiren aktivitelerden kaçınmalıdırlar.
   1 2 3 4 5 6
2. Bel ağrısı ile ilişkili fonksiyonel limitasyonlar psikososyal etkenlerin sonucudur.
   1 2 3 4 5 6
3. Bel ağrısı için en iyi öneri şudur: ''Dikkat edin ve gereksiz hareketleri yapmayın''.
   1 2 3 4 5 6
4. Bel ağrılı hastalar tercihen sadece ağrısız hareketleri yapmalıdırlar.
   1 2 3 4 5 6
5. Bel ağrısı, bel bölgesinde tehlikeli bir şeylerin varlığına işaret eder.
   1 2 3 4 5 6
6. Ağrı kalsa bile tedavi başarılı olmuş olabilir.
   1 2 3 4 5 6
7. Bel ağrısı organik bir yaralanmaya işaret eder.
   1 2 3 4 5 6
8. Tedavi bel ağrısında azalma sağlamıyorsa, uzun vadede ciddi kısıtlılıkların oluşma riski yüksektir.
   1 2 3 4 5 6
9. Ağrının azalması, normal fonksiyonların restorasyonu için bir ön şarttır.
   1 2 3 4 5 6
10. Ağrıda artış yeni doku hasarına ya da eski yaralanmanın genişlemesine/artışına işaret eder.
    1 2 3 4 5 6
11. Elektroterapi (TENS, US. vb) ve/veya bel korseleri fonksiyonel iyileşmeyi destekler.
    1 2 3 4 5 6
12. Hasta egzersiz sırasında ağrıdan yakınıyorsa hasar oluşmasından endişe ederim.
    1 2 3 4 5 6
13. Doku hasarının şiddeti ağrı düzeyini belirler.
    1 2 3 4 5 6

Scoring Method:

We would like you to indicate the level to which you agree or disagree with each statement. 1 = ''totally disagree'', 2 = ''largely disagree'', 3 = ''disagree to some extent'', 4 = ''agree to some extent'', 5 = ''largely agree'', and 6 = ''totally agree''.

For factor 1 the range is from 7 to 42, and from 6 to 36 for factor 2. To calculate the score of factor 1, add the scores of items 1, 4, 8, 9, 10, 11 and 13. For factor 2, add the scores of items 2, 3, 5, 6, 7 and 12.

Notice of Correction:
Changes have been made to this article since its original online publication date of December 24, 2014.