

## ORIGINAL ARTICLE

# Profit Bel Haritası Anketi Türkçe versiyonunun geçerlik güvenilirlik ve kültürler arası uyarlaması

Nezire KÖSE<sup>1</sup>, Hatice ÇETİN<sup>1</sup>, Ceyhun TÜRKMEN<sup>2</sup>, Esra DÜLGER<sup>3</sup>, Haluk TEKERLEK<sup>1</sup>, Sevil BİLGİN<sup>1</sup>

**Amaç:** Bu çalışmanın amacı, Profit Bel Haritası Anketi'nin (PBHA) Türkçe versiyonunun bel ağrılı bireylere uyarlanması, geçerliliği ve güvenilirliğinin araştırılmasıdır.

**Yöntem:** Çalışmaya kronik bel ağrısı olan 240 kişi alındı. Anketin güvenilirlik değerlendirmesi için değerlendiriciler arası güvenilirlik ve iç tutarlılık analizleri kullanıldı. Değerlendiriciler arası güvenilirlik sınıf içi korelasyon katsayısı (ICC) ile değerlendirildi ve iç tutarlılık için Cronbach alpha değeri hesaplandı. Eşzamanlı geçerlilik için PBHA puanları, Pearson korelasyon katsayısı analizi kullanılarak Oswestry Engellilik İndeksi (OEI) ve Vizüel Analog Skalası (VAS) ile karşılaştırıldı. Tüm katılımcılara PBHA, OEI, VAS ve Kısa Form-36 (KF-36) uygulandı.

**Bulgular:** Değerlendiriciler arası güvenilirlik için sınıf içi korelasyon katsayısı puanları 0,643 ile 0,767 arasında değişmekte olup, puanlayıcı içi sonuçların çok iyi olduğunu göstermektedir. PBHA'nın OEI arasındaki Pearson korelasyon katsayısı 0,594 olarak hesaplanırken VAS ile eşzamanlı geçerliliği 0,502 bulundu. Güvenilirlik analizi için PBHA'nın Cronbach alfa değeri 0,837 olarak kaydedildi. PBHA'nın SF-36 endeksleri ile ilişkileri orta ve iyi (0,28-0,52) arasında değişti.

**Sonuç:** PBHA'nın Türkçe versiyonu geçerli ve güvenilir. Bu ölçek, ağrının kronik bel ağrısı olan kişilerin semptomlarını ve fonksiyonel aktivitelerini nasıl ne sıklıkla ve ne kadar etkileyebileceğini ortaya koyabilir.

**Anahtar kelimeler:** Bel ağrısı, Sonuç ölçümü, Sonuçların tekrarlanabilirliği, Anketler ve ölçekler.

## Validity, reliability and cross-cultural adaptation of the Turkish version of the Profitmap-Back Questionnaire

**Purpose:** The aim of this current study was to investigate adaptation, validity, and reliability of the Turkish version of the Profile-Fitness Mapping Questionnaire (PFMQ) for people with low back pain.

**Methods:** Two hundred and forty participants who had chronic low back pain enrolled to the study. Intra-rater and internal consistency analysis were used for the reliability assessment of the questionnaire. Intra-rater reliability was assessed by intraclass correlation coefficient (ICC) and Cronbach's alpha was calculated for internal consistency. For concurrent validity, PFMQ scores were compared with ODI and VAS using Pearson's correlation coefficient analysis. The PFMQ, Oswestry Disability Index (ODI), Visual Analog Scale (VAS) and Short Form Health Survey instrument (SF-36) were administered to all participants.

**Results:** For intra-rater reliability, intraclass correlation coefficient scores were varying between 0.643 and 0.767, indicating that intra-rater results were very good. Pearson correlation coefficient of the PFMQ with ODI was calculated 0.594 and it was found with VAS was 0.502 for concurrent validity. For the reliability analysis, the Cronbach alpha value of the PFMQ were recorded as 0.837. The correlations with the SF-36 indices were changed between fair and good (0.28–0.52).

**Conclusion:** The Turkish version of the PFMQ is valid and reliable. This scale can reveal how, how often, and how much can pain affect the symptoms and functional activities of people with chronic low back pain.

**Keywords:** Low back pain, Outcome assessment, Reproducibility of results, Surveys and questionnaires.

1: Hacettepe University, Faculty of Physical Therapy and Rehabilitation, Ankara, Türkiye.

2: Çankırı Karatekin University, Faculty of Health Sciences, Department of Ergotherapy, Çankırı, Türkiye.

3: Gaziosmanpaşa University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Tokat, Türkiye.

Corresponding Author: Ceyhun Turkmen: ftceyhunturkmen@gmail.com

ORCID IDs (order of authors): 0000-0001-8342-7293; 0000-0001-8488-5763; 0000-0002-3125-4113; 0000-0002-0488-0127; 0000-0003-4514-4801; 0000-0003-1597-1312

Received: October 14, 2021. Accepted: May 25, 2022.



Low back pain (LBP) is well documented as an extremely common health problem; it is the leading cause of activity limitation and work absence throughout much of the world, and it causes an enormous economic burden on individuals, families, communities, industry and governments.<sup>1</sup> Compared with all health conditions, LBP is ranked as the number one cause of disability.<sup>2</sup>

The treatment of patients with LBP should be supportive, the goal being to improve pain and function rather than to cure the patient's condition. To evaluate with adequate instrument is necessary for deciding the most convenient treatment for patients.<sup>3</sup>

Evaluating of these patients includes completing an appropriate history, performing a comprehensive physical examination. As well as physical examination, patients' self-reported questionnaires of their functional abilities are important for evaluating how patients' experience their condition. These questionnaires can provide convenient method of synthesizing information about symptoms and activity limitations.<sup>4</sup> The scales are designed for monitoring the magnitude of changings in patients over time. Therefore, several disability scales have been developed for clinical evaluation of low back pain patients. Oswestry Disability Index (ODI),<sup>5</sup> Roland Morris Disability Questionnaire (RMDQ)<sup>6</sup> and Quebec Back Pain Disability Scale<sup>7</sup> are the most commonly used for measuring perceived disability because of low back pain. The neck version of the PFMQ questionnaire was translated into Br-Portuguese and Turkish.<sup>8,9</sup> In addition that, Björklund et al. were developed a scale namely Profile Fitness Mapping Questionnaire (PFMQ) for low back pain.<sup>10</sup>

PFMQ evaluates the low back pain patients with the comprehensive method in the frame of The International Classification of Functioning, Disability and Health (ICF) of World Health Organization. ICF provides biopsychosocial model of disability for diseases and disorders under the domains of "impairments" and "activity limitations".<sup>11</sup> PFMQ consists of two back-specific scales, designed for the assessment of self-estimated symptoms and functional limitation scales. Whereas the symptom scale measures the intensity and the frequency of the symptoms, the functional limitation scale assesses how back problem affected the

capability to perform an activity of daily life. The symptom scale includes symptoms such as stiffness, weakness, urination problems, stressed, anxiety, mood, sex life. The functional limitation scale includes limitations such as jump with both feet together, return to work, run, throw. For each item in the symptom scale, the respondent is asked how often and how much he/she experiences the symptoms; for each item in the frequency scale, the respondent is asked how he/she manage to activities. All items are scored six response alternatives from 1 to 6. PFMQ allows patients with low back pain to be assessed in detail with the frame of ICF includes three perspectives of health—a bodily, personal and social perspectives.<sup>10</sup>

PFMQ provides advantages in assessing low back pain patients in biopsychosocial frame. However, there is no Turkish version of PFMQ available. For this reason, the aim of this study was to investigate the reliability and validity of the Turkish version of the "Profile Fitness Mapping Questionnaire" in low back pain patients.

## METHODS

### Study design and participants

This study was conducted in Ankara/Turkey. This research has been approved by the Institutional Review Boards of the authors' affiliated institutions. Written permission was obtained from questionnaire developers for the Turkish version of the PFMQ for low back pain and translation and cultural adaptation were carried out according to the procedure established by Beaton et al.<sup>12</sup>

Advertisement was used for announcement for participation and a total of 240 native Turkish-speaking patients who were recruited from Department of Physiotherapy and Rehabilitation. The sample size of this study was chosen as 5 times the number of items used in the scale.<sup>13</sup> Participants who were 18 to 65 years of age who had a primary problem of low back pain that had persisted for 12 weeks or more, who had good verbal communication, and who had the ability to read and write in Turkish included. It was considered sufficient for the participants to state that they had experienced pain for more than 12 weeks. Participants with neurological, musculoskeletal and

cardiovascular disease, history of lumbar surgery and current pregnancy were excluded. Informed consent was obtained from all individual participants included in the study.

#### **Translation and cultural adaptation**

As the first step, contact was established via mail with Dr. Björklund from the Department of Occupational and Public Health Sciences, University of Gävle, Sweden.<sup>10</sup> After the permission, the original English form of the questionnaire was translated into Turkish by two native Turkish speakers with good command of English. One of them was a physiotherapist and aware of study, the other one was an English linguistic scientist, but unaware of the concepts. The two versions of the Turkish translation were combined into a single translation by the two translators. This combined Turkish version of the questionnaire was again translated back to English by two bilingual translators (back translation). Bilingual translators were unaware of the study. Afterwards, all versions were reviewed by the expert committee. There were two physiotherapists, two bilingual translators and a specialist in public health science in the committee. The content of the original and reverse-translated English versions was compared, and differences were noted. The reviewers commented on the differences and a synthesis was created of these differences. The pre-final form of the questionnaire was created following the evaluation of the resultant translations for English–Turkish language and cultural adaptation by the committee. The comprehensiveness of the questionnaire was evaluated in a pilot group of 40 people (20 patients-20 healthy individuals) and they were asked about the comprehensibility of each item in the questionnaire (face validity). The final form of the questionnaire was established by the committee based on the findings after the pilot group completed the questionnaire (Figure 1).

#### **Instruments**

PFMQ consisting of two subscales: symptom scale (26 items) and functional limitation scale (24 items). The symptom scale also consists of two indices of separate aspects of symptomatology, the *intensity* and the *frequency* of the symptoms, and the functional limitation scale yields one function index. Frequency (f) is the answer on *how often* the symptom is felt (6-point scale from 1=never/very

seldom, to 6=very often/ always). Intensity (i) is the answer on *how much* the symptom is felt (6-point scale from 7=nothing/none at all, to 12=almost unbearable/unbearable, all/maximally). The answers of the functional limitation scale (fl) range from 1=very good, no problem, very satisfying, very likely, to 6=very bad, very difficult/impossible, very dissatisfying, very unlikely. The result of each index is expressed as the percentage of the maximum score, where 100% is the best possible result. Adjustments due to omitted questions are done by removing the maximum score for those questions from the denominator before calculating the percentage. Thus, three index percentages and total percentage are obtained from this questionnaire.<sup>10</sup>

ODI is the most commonly used outcome measure for LBP and this index assesses ten different aspects of disability (pain, personal care, lifting, sitting, standing, sleeping, sex life, social life, walking and travelling). Each parameter is scored from 0 to 5, with 0 indicating no functional limitation due to pain and 5 indicating a major functional disability due to LBP.<sup>14</sup> This questionnaire is scored using a global percentage score. The obtainable maximum score is 50, which corresponds to 100%.<sup>15</sup>

*Visual Analog Scale (VAS)* is a vertical line, 100 mm in length, with bottom of the line indicating “no pain” and top of the line worst pain; possible score lies between 0 and 10. Subjects were administered with the VAS to assess for pain. VAS score was calculated that ranged from 0 to 10.<sup>16</sup>

*Short-Form 36 (SF-36)* includes one multi-item scale that assesses eight health concepts with 36 items: physical functioning (PF), social functioning (SF), role limitations due to physical role limitations (PRL), role limitations due to emotional problems (ERL), mental health (MH), vitality/energy (V), bodily pain (BP), and general health (GH). Each question's score was coded, summed, and transmuted to a scale of 0 (worst possible health state measured by the questionnaire) to 100 (best possible health state).<sup>17</sup>

#### **Statistical analysis**

##### **Reliability**

Intra-rater reliability and internal consistency have been considered as 2 common forms of reliability. *Intra-rater reliability*

evaluates stability over time, by administering the same test to the same individuals at 2 points in time. The intra-rater reliability analysis was performed with 86 of the 240 patients after one week.

In this study, the responses from 2 administrations were collected for data analysis, and ICC was used to evaluate intra-rater reliability. It has been defined that ICCs can vary from 0.00 to 1.00, where values of 0.60 to 0.80 are regarded as evidence of good reliability and with those above 0.80 indicating excellent reliability.<sup>18</sup> Internal consistency of the scale that relates to its homogeneity was also analyzed by Cronbach's alpha. For internal consistency, values equal or more than 0.70 were considered as satisfactory, and it is

suggested that the value of alpha should be above 0.80 for acceptance as high internal consistency.<sup>19</sup> The SEM was calculated using the following equation:  $SD \sqrt{1 - ICC}$ , in which SD is the standard deviation. The SDC was calculated by  $1.96 \times \sqrt{2} \times SEM$ .<sup>18</sup>

### Validity

The concurrent validity of the questionnaire was assessed by asking the patients to complete Profile Fitness Mapping Questionnaire, ODI, Visual Analog Scale (VAS) and Short-Form 36 (SF-36). The concurrent validity coefficients were accepted as:  $r=0.81$  to 1.0, excellent; 0.61 to 0.80, very good; 0.41 to 0.60, good; 0.21 to 0.40, fair; and 0 to 0.20, poor.<sup>20</sup>

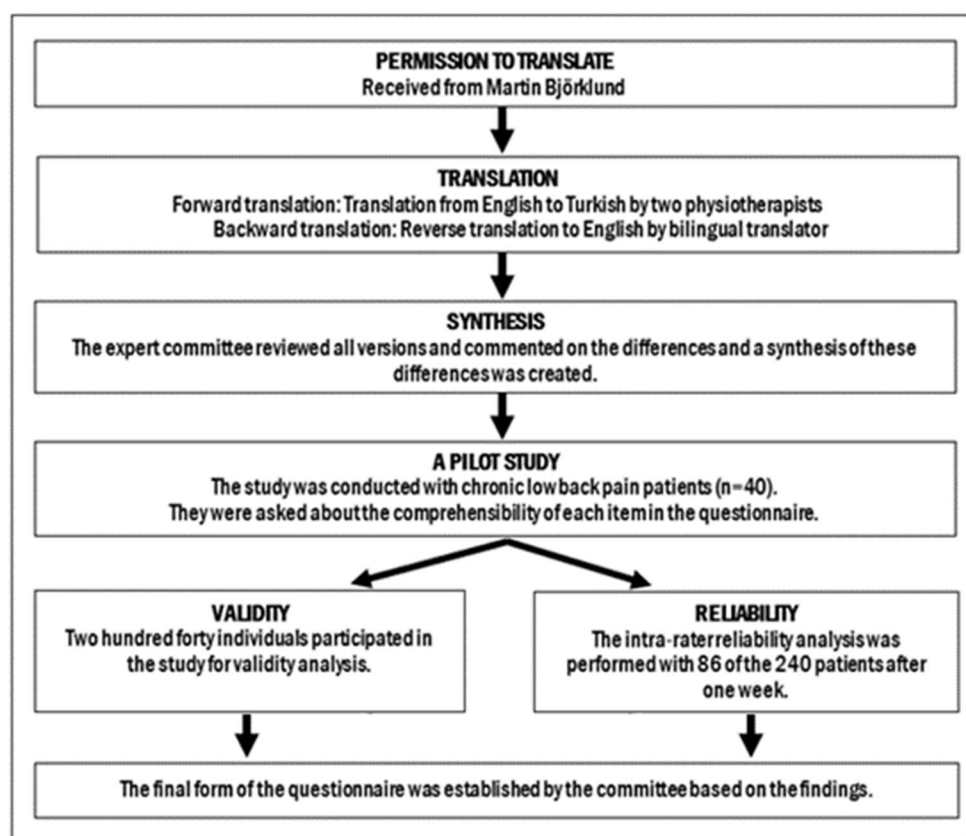


Figure 1. Flowchart of the study.

## RESULTS

### Translation and Cross-cultural adaptation

In order to make them easier to understand, the main changes made to the

symptom scale where question sentences were added to items 25 and 26. For the functional limitation scale, the word “weight (ağırlık, in Turkish)” was added to items 6 and 7 to make “carry weight (ağırlık taşımak, in Turkish)” and

“lift weight (ağırlık kaldırmak, in Turkish)”. Moreover, “throw” was changed to “throw stuff”. The word “sweater” was culturally adapted to “T-shirt/sweater (tişört/kazak, in Turkish) ” because of the changeable weather conditions in Turkey (Appendix).

#### **Demographic characteristics**

Two hundred and fifty-two individuals between the ages of 15-75 years, participated in the study. Twelve patients were excluded from the study because they incorrectly filled the questionnaire, and thus, the final number of the participants was 240. The mean age of the included subjects was  $34.36 \pm 15.44$  years, and 70.2% were female and 29.8% were male. Detailed demographic data are listed in Table 1. The intra-rater analysis was performed with 86 of the 240 patients after one week, and they received no treatment for 7 days.

#### **Reliability**

##### ***Internal consistency***

For the reliability analysis, Cronbach's alpha values of PFMQ indices was recorded as; for symptom frequency index 0.817, for functional index 0.868, and for total score 0.837 which indicates that the questionnaire has a high internal consistency (Table 2). Also, for symptom intensity index 0.783 which indicates that the questionnaire has a satisfactory internal consistency. For the internal consistency analysis, all items had good item-total correlations. The average item-total correlations for the PFMQ scales were in general high (the symptom scale; intensity index:  $0.31 \pm 0.13$  and frequency index:  $0.38 \pm 0.12$ . The functional limitation scale; function index:  $0.52 \pm 0.15$ ).

##### ***Intra-rater reliability***

ICC values ranged from 0.643 to 0.767 (Table 3). ICC values of PFMQ was recorded as; for symptom frequency index 0.691, for symptom intensity index 0.643, for functional index 0.767, and for total score 0.712. According to ICC values, PFMQ intra-rater reliability results were found to be very good. The SEM varied from 4 to 12 and the SDC ranged from 11 to 38 points (Table 2).

##### **Validity**

The correlation coefficients between the PFMQ indices and the criterion questionnaires were presented in Table 3. For the validity, the correlation of PFMQ with ODI was found  $r: -0.594$  and VAS was  $r: -0.502$ . As a result of

PFMQ indices, the correlations of symptom frequency index, symptom intensity index and functional index with ODI respectively,  $r: -0.531$ ,  $r: -0.414$ ,  $r: -0.600$ . Based on these results, PFMQ was found to have a good negative correlation with the ODI. The correlations with the SF-36 indices were changed between fair and good (0.28-0.52) (Table 3).

## **DISCUSSION**

This study demonstrated the reliability and validity of the Turkish version of the PFMQ. Also, the PFMQ was successfully cross culturally adapted into Turkish.

The present study shows that the Turkish version of the PFMQ has good internal consistency. This was compatible with the internal consistency level usually found appropriate for other measures ( $>0.7$ ) (symptom frequency 0.817, symptom intensity 0.783, function index 0.868, total score 0.837). For intra-rater reliability, we found that the total ICC value was 0.830 at one week for the intra-rater reliability intervals ICC values above 0.80 showed excellent consistency). We also analyzed the SEM and SDC of the PFMQ scale and recorded an SEM of 4 to 12 points and an SDC of 11 to 38 points (assuming the maximum score was 100 points). According to these results, a change of at least 11 to 38 points on the PFMQ questionnaire is required to be 95% confident that the change is greater than the variability of an individual in stable condition. The report of the original version of the PFMQ reported slightly more reliable SEM and SDC values than our study (between 4-6 points and 15-18 points, respectively). The values for the Brazilian version are much more reliable (2-3 points for SEM and 5-8 points for SDC). However, the fact that the test-retest time was only 5 hours in the Br-Portuguese version and the test-retest time in our study was one week may explain the differences between these versions in terms of reliability.<sup>9</sup> The calculations of Cronbach's alpha revealed excellent consistency among the PFM items in the original article of PFMQ (symptom frequency index 0.90, symptom intensity index 0.91, function index 0.95).<sup>10</sup> These results are similar to the current study.

For validity, the present study assessed the correlation between the PFMQ and the ODI, VAS, and SF-36. In the determination of

Table 1. Baseline demographics of the participants (N=240).

	Mean±SD	n (%)
Age	34.36±15.44	
Gender (Female/Male)		165/75 (68/32)
Height (cm)	167.57±8.82	
Body weight (kg)	70.44±15.16	
Body mass index (kg/m <sup>2</sup> )	25.06±5.02	
Educational level		
Elementary- Mid School		47 (19.5)
High School		44 (18.3)
Graduate School		149 (62)
Visual Analog Scale (VAS) (0-10 cm)	2.95±1.74	
Oswestry Disability Index (ODI) (0-100) <sup>a</sup>	20.44±13.80	
The Short Form Health Survey (SF-36)		
Physical Functioning (0-100) <sup>a</sup>	67.97±19.65	
General Health (0-100) <sup>a</sup>	55.88±17.77	
Emotional Role Limitations (0-100) <sup>a</sup>	54.10±33.13	
Vitality (0-100) <sup>a</sup>	48.98±17.58	
Physical Role Limitations (0-100) <sup>a</sup>	55.14±38.31	
Social Functioning (0-100) <sup>a</sup>	67.82±19.57	
Bodily Pain (0-100) <sup>a</sup>	59.64±20.17	
Profile Fitness Mapping (ProFitMap) Questionnaire		
Symptom frequency index (0-100) <sup>a</sup>	70.21±16.31	
Symptom intensity index (0-100) <sup>a</sup>	74.73±18.12	
Function index (0-100) <sup>a</sup>	67.56±19.52	
Total Score (0-100) <sup>a</sup>	70.92±15.54	

a: 0=Worst score and 100=Best score.

Table 2 Cronbach's alpha, intraclass correlation coefficients (ICC), standart error measurement (SEM) and smallest detectable change (SDC) values of the Profile Fitness Mapping Questionnaire.

	Cronbach's Alpha	ICC (95% CI)	SEM	SDC <sub>95</sub>
The Profile Fitness Mapping Questionnaire				
Symptom frequency Index	0.817	0.691 (0.562-0.787)	0.04	0.11
Symptom intensity Index	0.783	0.643 (0.500-0.752)	0.05	0.14
Function Index	0.868	0.767 (0.664-0.842)	0.05	0.14
Total Score	0.837	0.712 (0.628-0.812)	0.12	0.38

ICC intraclass correlation coefficient. SEM =Standard Error Measurement =SD√1-ICC., SDC<sub>95</sub> = Smallest Detectable Change= 1.96×SEM×√2.

construct validity, there was a very good correlation between the Turkish PFMQ and the Turkish validated version of the ODI (r for total score: 0.59). Furthermore, all indices of the PFMQ showed very good correlation with the ODI (r for symptom intensity index: 0.53; r for symptom frequency index: 0.41; r for function scale: 0.60). Similar to the current study,

Spearman's correlations between PFMQ total score and Roland Morris disability questionnaire (r=0.61) and the low-back outcome score (r=0.67) showed excellent correlation.<sup>10</sup>

The correlation value between the PFMQ and VAS was 0.51 in our study (very good correlation). Björklund et al. did not use the

Table 3. Bivariate correlations between the Profile Fitness Mapping Questionnaire index scores and the scores of the criterion questionnaires.

	Profile Fitness Mapping Questionnaire			
	Symptom frequency index	Symptom intensity index	Function index	Total score
	r	r	r	r
Visual Analog Scale (VAS) (0-10 cm)	-0.497*	-0.385*	-0.428*	-0.502*
Oswestry Disability Index (ODI) (0-100)	-0.531*	-0.414*	-0.600*	-0.594*
The Short Form Health Survey (SF-36)				
Physical Functioning (0-100)	0.468*	0.350*	0.557*	0.528*
General Health (0-100)	0.472*	0.372*	0.436*	0.491*
Emotional Role Limitations (0-100)	0.284*	0.284*	0.285*	0.329*
Vitality (0-100)	0.307*	0.257*	0.237*	0.307*
Physical Role Limitations (0-100)	0.317*	0.234*	0.362*	0.353*
Social Functioning (0-100)	0.377*	0.281*	0.398*	0.405*
Bodily Pain (0-100)	0.345*	0.287*	0.341*	0.284*

\*  $p < 0.01$ . r. Pearson correlation coefficient.

VAS in the original article of PFMQ. However, VAS was included in the original article of the form of ProFitMap for chronic neck pain, "ProFitMap-neck".<sup>21</sup> The correlation value between the ProFitMap-neck and VAS was 0.68 in the Turkish version of ProFitMap-neck (excellent correlation).<sup>8</sup> In the Br-Portuguese version of the ProFitMap-neck, the correlation values between the domains of the Br-ProFitMap-neck and NDI varied from 0.56 to 0.71 (very good and excellent correlations).<sup>9</sup> Our results are consistent with these studies.

The correlation values between the PFMQ (total score) and SF-36 items varied from 0.28 and 0.52 (good and very good correlations) in our study. In the original article of PFMQ, the correlation values between the PFMQ (total score) and SF-36 items varied from 0.27 and 0.59.<sup>10</sup> These results are very similar to our study results.

#### *Comparison the other scales*

When we analyzed the other Turkish version scales, there was a positive correlation between Turkish version of the Quebec Back Pain Disability Scale and Turkish version of the ODI.<sup>22</sup> Yakut et al. showed excellent correlation between the RMDQ and ODI.<sup>14</sup>

Despite the high correlation level between the two scales, the ODI and PFMQ have some different features. Considering the

International Classification of Functionality, Disability and Health (ICF), ODI includes three sub-items of body functions, 18 sub-items of activity and participation, and 3 sub-items of environmental factors.<sup>14,23</sup> Although ODI is a scale containing many sub-items of ICF parameters, it is insufficient to evaluate some ICF sub-items such as "pain sensation in lower limb (b28015)", "bending activities (d4105)" and emotional functions (b152)". The PFMQ evaluates body functions and activity and participation sub-items more comprehensively than the ODI.<sup>23</sup> However, PFMQ is not suitable for the evaluation of environmental factors in patients with low back problems in Turkish population. Since PFMQ is not suitable for the assessment of environmental factors, an additional scale that evaluates environmental factors such as RMDQ can be used when evaluating patients.<sup>24</sup>

#### **Limitations**

Due to the cultural differences between regions in terms of understanding and interpreting the PFMQ, its applicability in other regions of the country should also be observed. Conducting the study only in a specific region may be a limitation of the study.

#### **Conclusion**

The PFMQ in Turkish language, showed good properties to assess for many ICF

parameters related low back in Turkish LBP population. These results suggest that the questionnaire can be used to evaluation in Turkish LBP patients, for symptoms and functional activities.

**Acknowledgement:** The authors thank Dr. Martin Björklund (*Faculty of Health and Occupational Studies, University of Gävle, Gävle, Sweden*) for his permission to translate the “Profile Fitness Mapping Questionnaire for Low Back Patients” into Turkish, and the members of the committee (*Jern Hamberg, Marina Heiden, Margareta Barnekow-Bergkvist*) for their cooperation.

**Authors’ Contributions:** **NK:** Conceptualization, study design, data collection, writing; **HÇ:** data collecting, writing; **CT:** data collection, writing; **ED:** data collection, writing; **HT:** data analysis, writing; **SB:** data analysis, supervision.

**Funding:** *None*

**Conflicts of Interest:** *None*

**Ethical Approval:** The protocol of the present study was approved by the Hacettepe University Research Ethics Committee (issue: GO 16/235 date: 10.05.2016).

## REFERENCES

- Hoy D, March L, Brooks P, et al. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis.* 2014; 73: 968-74.
- Lee H, Hübscher M, Moseley GL, et al. How does pain lead to disability? A systematic review and meta-analysis of mediation studies in people with back and neck pain. *Pain* 2015; 156: 988-97.
- Patrick N, Emanski E and Knaub MA. Acute and chronic low back pain. *Med Clin North Am.* 2014; 98: 777-89.
- Fritz JM and Irrgang JJ. A comparison of a modified Oswestry low back pain disability questionnaire and the Quebec back pain disability scale. *Phys Ther.* 2001; 81: 776-88.
- Fairbank J, Couper J, Davies J, et al. The Oswestry low back pain disability questionnaire. *Physiotherapy.* 1980; 66: 271-3.
- Roland M and Fairbank J. The Roland–Morris disability questionnaire and the Oswestry disability questionnaire. *Spine (Phila Pa 1976).* 2000; 25: 3115-3124.
- Kopec JA, Esdaile JM, Abrahamowicz M, et al. The Quebec Back Pain Disability Scale. Measurement properties. *Spine (Phila Pa 1976).* 1995; 20: 341-352.
- Cetin H, Köse N, Bilgin S, et al. The ProFitMap-neck-a questionnaire for measuring symptoms and functional limitations in neck pain: reliability, validity and cross-cultural adaptation of the Turkish version. *Turk J Med Sci.* 2020; 50: 937-944.
- Ferreira MC, Björklund M, Dach F, et al. Cross-cultural adaptation of the profile fitness mapping neck questionnaire to Brazilian Portuguese: internal consistency, reliability, and construct and structural validity. *J Manipulative Physiol Ther.* 2017; 40: 176-186.
- Björklund M, Hamberg J, Heiden M, et al. The assessment of symptoms and functional limitations in low back pain patients: validity and reliability of a new questionnaire. *Eur Spine J.* 2007; 16: 1799-1811.
- Jelsma J. Use of the International Classification of Functioning, Disability and Health: a literature survey. *J Rehabil Med.* 2009; 41: 1-12.
- Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976).* 2000; 25:3186-3191.
- Tsang S, Royse CF and Terkawi AS. Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine. *Saudi J Anaesth.* 2017; 11: S80-S89.
- Yakut E, Düger T, Öksüz Ç, et al. Validation of the Turkish version of the Oswestry Disability Index for patients with low back pain. *Spine (Phila Pa 1976).* 2004; 29: 581-585.
- Stoll TM, Dubois G and Schwarzenbach O. The dynamic neutralization system for the spine: a multi-center study of a novel non-fusion system. *Eur Spine J.* 2002; 11: S170-S178.
- Hawker GA, Mian S, Kendzerska T, et al. Measures of adult pain: Visual Analog Scale for Pain (VAS Pain), Numeric Rating Scale for Pain (NRS Pain), McGill Pain Questionnaire (MPQ), Short-Form McGill Pain Questionnaire (SF-MPQ), Chronic Pain Grade Scale (CPGS), Short Form-36 Bodily Pain Scale (SF-36 BPS), and Measure of Intermittent and Constant Osteoarthritis Pain (ICOAP). *Arthritis Care Res (Hoboken).* 2011; 63 (Suppl 13):S240-S252.
- Jenkinson C, Coulter A and Wright L. Short form 36 (SF36) health survey questionnaire: normative data for adults of working age. *BMJ.* 1993; 306: 1437-1440.
- Weir JP. Quantifying test-retest reliability using the intraclass correlation coefficient and the SEM. *J Strength Cond Res.* 2005; 19: 231-240.
- Osburn HG. Coefficient alpha and related



- internal consistency reliability coefficients. *Psychol Methods*. 2000; 5: 343-355.
20. Shrout PE and Fleiss JL. Intraclass correlations: uses in assessing rater reliability. *Psychol Bull*. 1979; 86: 420-428.
  21. Björklund M, Hamberg J, Heiden M, et al. The ProFitMap-neck—reliability and validity of a questionnaire for measuring symptoms and functional limitations in neck pain. *Disabil Rehabil*. 2012; 34: 1096-1107.
  22. Melikoglu MA, Kocabas H, Sezer I, et al. Validation of the Turkish version of the Quebec back pain disability scale for patients with low back pain. *Spine (Phila Pa 1976)*. 2009; 34: E219-E224.
  23. Sigl T, Cieza A, Brockow T, et al. Content comparison of low back pain-specific measures based on the International Classification of Functioning, Disability and Health (ICF). *Clin J Pain*. 2006; 22: 147-153.
  24. Küçükdeveci AA, Tennant A, Elhan AH, et al. Validation of the Turkish version of the Roland-Morris Disability Questionnaire for use in low back pain. *Spine (Phila Pa 1976)*. 2001; 26: 2738-2743.