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DEVELOPMENT OF PELVIC FLOOR HEALTH KNOWLEDGE QUIZ: VALIDITY AND RELIABILITY

ORIGINAL ARTICLE

ABSTRACT

Purpose: Although pelvic floor dysfunctions encompass a wide variety of interrelated clinical conditions, the tools that question individuals' knowledge level related to these problems are not comprehensive and sufficient. This study aimed to develop Pelvic Floor Health Knowledge Quiz (PFHKQ) and to determine its validity and reliability.

Methods: A 37-item quiz was prepared to measure the knowledge of pelvic floor health and administered in 370 participants (273 females, 97 males). Face validity, content validity, construct validity, and known-group validity were analyzed for validity. The Person Separation Index (PSI) and the Kuder-Richardson-20 (KR-20) coefficient values were calculated for reliability.

Results: The face validity analysis showed that all items of the test were quite understandable (range 83.02%-98.11%). According to the Rasch model, a knowledge quiz with three subscales (function/dysfunction; risk/etiology; diagnosis and treatment) and 29 items were defined. Individuals who were health professionals or students in the health field had more PFHKQ scores compared to the other participants ($p<0.05$). There were significant differences between the participants' knowledge scores in terms of previously having heard of any pelvic floor problems and pelvic floor exercises (PFE) ($p<0.05$). The PSI and the KR-20 values were 0.892 and 0.890 for the function/dysfunction subscale, 0.938 and 0.920 for the risk/etiology subscale, 0.912 and 0.924 for the diagnosis and treatment subscale, and 0.952 and 0.926 for the PFHKQ total score, respectively.

Conclusion: In the Turkish people, the PFHKQ was found to be a valid and reliable tool.

Key Words: Knowledge; Pelvic floor; Questionnaires.

PELVİK TABAN SALIĞI BİLGİ TESTİ'NİN GELİŞTİRİLMESİ: GEÇERLİK VE GÜVENİRLİK

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Pelvik taban disfonksiyonları birbiri ile ilişkili çok çeşitli klinik koşulları kapsamasına rağmen, bireylerin bu problemlerle ilişkili bilgi düzeylerini sorgulayan araçlar kapsamlı ve yeterli değildir. Bu çalışmanın amacı, Pelvik Taban Sağlığı Bilgi Testi (PTSBT)'ni geliştirmek ve testin geçerlik ve güvenirliği belirlemekti.

Yöntem: Pelvik taban sağlığı bilgisini ölçmek amacıyla 37 maddeden oluşan bir test hazırlandı ve 370 katılımcıya (273 kadın, 97 erkek) uygulandı. Geçerlik için görünüş geçerliği, kapsam geçerliği, yapı geçerliği ve bilinen grup geçerliği analiz edildi. Güvenirlik için Birey Ayırsama İndeksi (BAİ) ve Kuder-Richardson-20 (KR-20) katsayıları hesaplandı.

Bulgular: Görünüş geçerliği analizi testin tüm maddelerinin yeterince anlaşılır (% 83,02 ile % 98,11) olduğunu gösterdi. Rasch modeline göre üç alt boyutlu (fonksiyon/disfonksiyon; risk/etiyoloji; tanı ve tedavi) ve 29 maddeli bir bilgi testi tanımlandı. Sağlık çalışanı veya öğrencisi olan bireyler, diğer katılımcılarla göre daha fazla PTSBT skorlarına sahipti ($p<0,05$). Pelvik taban problemlerini ve pelvik taban egzersizlerini (PTE) daha önceden duymuş olmaları ve uygulamış olmaları açısından katılımcıların bilgi skorları arasında anlamlı farklılık vardı ($p<0,05$). BAİ ve KR-20 değerleri, sırasıyla, fonksiyon/disfonksiyon alt boyutu için 0,892 ile 0,890, risk/etiyoloji alt boyutu için 0,938 ile 0,920, tanı ve tedavi alt boyutu için 0,912 ile 0,924 ve PTSBT toplam skoru için 0,952 ile 0,926 olduğu bulundu.

Sonuç: Türk toplumunda PTSBT'nin geçerli ve güvenilir bir araç olduğu gösterildi.

Anahtar Kelimeler: Bilgi; Pelvik taban; Anketler.

INTRODUCTION

The pelvic floor is a structure composed of muscles, connective tissues, nerves, and vessels that supports pelvic organs and covers the pelvic floor (1,2). When the pelvic floor is affected, various pelvic floor dysfunctions such as incontinence, pelvic organ prolapse, pelvic pain, and sexual dysfunction may occur (2). Pelvic floor dysfunctions and its consequential effects may be caused by many factors such as gender differences, ageing, pregnancy, type of birth, obesity and pelvic surgery (3,4).

Pelvic floor dysfunctions affect the quality of life negatively, although not life-threatening (5). Pelvic floor dysfunctions are an essential and common health issue (6,7). Many scales and questionnaires have been developed to evaluate the symptoms and the quality of life related to pelvic floor dysfunctions (8,9). Moreover, the level of knowledge related to these dysfunctions could be evaluated using a few tools which are valid and reliable in a Turkish population (10,11). These tools also contain information about only incontinence and prolapse. Although the pelvic floor dysfunctions are a wide range, the tools that question individuals' knowledge level related to these dysfunctions are not comprehensive and sufficient. Considering the knowledge level related to the dysfunctions is very important in creating necessary training and exercise programs in preventive health services. Therefore, this study aimed to develop a Pelvic Floor Health Knowledge Quiz (PFHKQ) in Turkish and to determine its validity and reliability.

METHOD

Study Design

In the current study, a methodological design was used. The study was conducted following the principles of the Helsinki Declaration. The study was approved by the Ethics Committee of Ankara Yıldırım Beyazıt University (Approval Date: 10.10.2018 and Approval Number: 10.10.2018-20).

Participants

In this study, the PFHKQ was administered to patients in the Gynecology and Obstetrics Policlinic at Ataturk Training and Research Hospital and Urology Polyclinic at Ankara Gazi Mustafa Kemal Hospital, and their relatives between October 2018 and July 2019. The inclusion criteria were being a native Turkish speaker, older than 18 years and volunteered to participate in the study. The exclusion criteria included having communication problems involving both comprehension and expression and not filling out the test administered (11). Written informed consent of all participants was obtained.

Evaluation

Participants' physical and demographic information was recorded. Complaints about pelvic floor dysfunctions were recorded as "present" or "absent". In order to evaluate their awareness about the pelvic floor, the participants were asked if they had ever heard about pelvic floor dysfunctions, if they knew about pelvic floor exercise (PFE), and if they were performing PFE.

Development and Implementation Process of the Pelvic Floor Health Knowledge Quiz

In the development of the PFHKQ, four stages were used, namely, problem identification, item writing, obtaining expert opinion, and pre-application/analysis. The literature was extensively investigated to use of the possible keywords of the study to develop the knowledge test. Therefore, the sub-objectives and general objectives were determined. Based on the review of the literature, the titles of the subscales were developed, namely, pelvic floor function/dysfunction, risk factors, diagnosis, and treatment of pelvic floor dysfunctions. Forty-four items containing positive and negative expressions per these subscales were prepared, and the compatibility of these items with the rules of language and assessment was evaluated with the help of an assessment and evaluation specialist. All items were created simply and understandably with three response categories: "yes", "no", "I do not know". A dichotomous system was used for scoring: "1" point for the items that were answered correctly and "0" point to the items that were answered incorrectly or unknown.

Expert opinion was used because it is one of the accepted ways of determining content validity. Five faculty members consisting of physiotherapists, gynecologist and obstetrician, and psychological counselling and guidance (TA, DOK, SO, AFY, and ECV) were consulted. Test the content validity of the PFHKQ, to assess whether the questions measure the area to be studied and whether they contain different points outside the area to be measured were determined. An expert opinion form was developed for each expert to evaluate the suitability of the developed test for its purpose. After the expert opinions, expressions of some items were changed, and a draft PFHKQ with 37 items was prepared. Nine of these items included negative expression in determining participants' knowledge about pelvic floor health. Content distribution, according to the subscales of this test: pelvic floor function/dysfunction 8 items, risk factors of pelvic floor dysfunctions 18 items, and diagnosis and treatment 11 items.

Statistical Analysis

The normality assumption for the continuous variables, such as age and body mass index (BMI), was assessed by the Shapiro-Wilk test and normality plots. All continuous and categorical variables were reported as median (min-max), frequency and percentages, respectively. The rates of "understand-

Table 1: Item Fit Statistics of the Subscale.

Subscale-Items	β±SE	Residual	x²	df	p
Function/Dysfunction					
1	-1.13±0.18	-1.21	5.429	3	0.143
2	-0.80±0.17	-1.90	7.929	3	0.048
3	1.08±0.15	0.24	2.062	3	0.560
4	-0.45±0.16	-0.61	4.699	3	0.195
5	1.00±0.15	0.66	7.724	3	0.052
6	-0.31±0.16	-0.06	2.008	3	0.571
7	1.28±0.16	2.06	6.398	3	0.094
8	-0.65±0.16	-0.46	3.683	3	0.298
Risk/Etiology					
9	-1.14±0.17	-0.83	3.116	3	0.374
11	-0.58±0.15	-0.09	2.015	3	0.569
12	-0.33±0.15	-1.48	9.084	3	0.028
13	0.93±0.15	1.08	2.598	3	0.458
14	0.15±0.14	-0.98	5.128	3	0.163
15	-0.42±0.15	-0.74	6.823	3	0.078
18	0.24±0.14	1.26	1.846	3	0.605
19	0.94±0.15	2.04	4.097	3	0.251
20	0.07±0.14	1.90	1.435	3	0.697
21	0.24±0.14	2.05	5.316	3	0.150
22	0.00±0.14	-0.01	6.649	3	0.084
25	0.07±0.14	-0.64	6.665	3	0.083
26	-0.18±0.15	-0.24	2.305	3	0.511
Diagnose/Treatment					
27	-0.70±0.19	-0.08	1.485	2	0.476
29	0.15±0.16	0.44	0.377	2	0.828
30	-0.68±0.18	-1.28	3.461	2	0.177
32	-0.33±0.17	-0.30	2.978	2	0.226
33	-0.02±0.17	-1.98	4.088	2	0.129
34	1.57±0.16	1.31	5.143	2	0.076
35	0.92±0.16	1.30	1.304	2	0.521
37	-0.89±0.19	-1.48	5.892	2	0.053
PFHKQ					
Subtest 1 (1st Subscale)	0.05±0.04	1.31	1.662	3	0.645
Subtest 2 (2nd Subscale)	0.07±0.03	-1.88	3.885	3	0.274
Subtest 3 (3rd Subscale)	-0.13±0.04	0.77	2.722	3	0.899

Bonferroni correction adjusted p-value 0.006 for the 1st and the 3rd subscale, p=0.004 for the 2nd subscale, and p=0.017 for overall. β: item difficulty, SE: standard error, df: degrees of freedom. PFHKQ: PFHKQ: Pelvic Floor Health Knowledge Questionnaire.

able" and "completely understandable" responses were calculated for each item, and the mean rates were used to assess the face validity of the PFHKQ. The Rasch analysis was performed to evaluate the construct validity of the PFHKQ by considering model fit, unidimensionality, local dependency, Person-Separation-Index (PSI), differential item functioning (DIF) based on gender and education level, and item difficulty using a Wright map (12,13). Bonferroni correction applied multiple tests. The correction adjusted p-value 0.006 for the first and the third subscale, p=0.004 for the second subscale, and p=0.017 for overall.

The total and subscale scores of the PFHKQ were compared by the Mann-Whitney U test considering some demographical and clinical features. The internal consistency of the knowledge test scored as "0", and "1" was examined by Kuder Richardson-20 (KR-20) coefficient. A p-value <0.05 was considered statistically significant. The Rasch analysis was performed by RUMM2020 (RUMM, Perth, Western Australia), and other statistical calculations were done using IBM SPSS Statistics 22.0 (IBM Corp. Release 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY, USA).

RESULTS

Age and BMI of the participants were 36 (18-84) years and 24.12 (14.69-44.08) kg/m^2, respectively. The 73.8% (n=273) of the participants were females. The 40.6% (n=150) were high school graduates. The 28.1% (n=104) of the participants were health professional/students. When the pelvic floor

Table 2: Transformation of Raw Scores to Rasch Scores.

Raw Score	Total PFHKQ	1st Subscale	2nd Subscale	3rd Subscale
	θ±SE	θ±SE	θ±SE	θ±SE
0	-2.32±0.92	-2.79±1.35	-3.10±1.27	-2.71±1.34
1	-1.81±0.65	-1.90±0.99	-2.25±0.91	-1.83±0.98
2	-1.48±0.50	-1.17±0.84	-1.63±0.74	-1.12±0.82
3	-	-0.58±0.78	-1.17±0.65	-0.56±0.77
4	-1.11±0.38	-0.02±0.77	-0.80±0.61	-0.03±0.75
5	-0.98±0.35	0.54±0.79	-0.46±0.58	0.50±0.78
6	-0.87±0.33	1.17±0.86	-0.15±0.57	1.10±0.85
7	-0.77±0.32	1.94±1.02	0.15±0.57	1.88±1.02
8	-0.68±0.31		0.47±0.58	
9	-0.59±0.30		0.80±0.61	
10	-0.51±0.29		1.17±0.65	
11	-0.43±0.29		1.63±0.74	
12	-0.35±0.29		2.25±0.91	
13	-0.27±0.29			
14	-0.19±0.30			
15	-0.10±0.30			
16	-0.00±0.31			
17	0.09±0.32			
18	0.20±0.33			
19	0.32±0.35			
20	0.45±0.36			
21	0.59±0.38			
22	0.74±0.40			
23	0.91±0.42			
24	1.09±0.44			
25	1.29±0.48			
26	1.54±0.53			
27	1.84±0.61			
28	2.30±0.78			
29	2.98±1.11			

θ: Rasch Score, SE: Standard Error. PFHKQ: Pelvic Floor Health Knowledge Questionnaire.

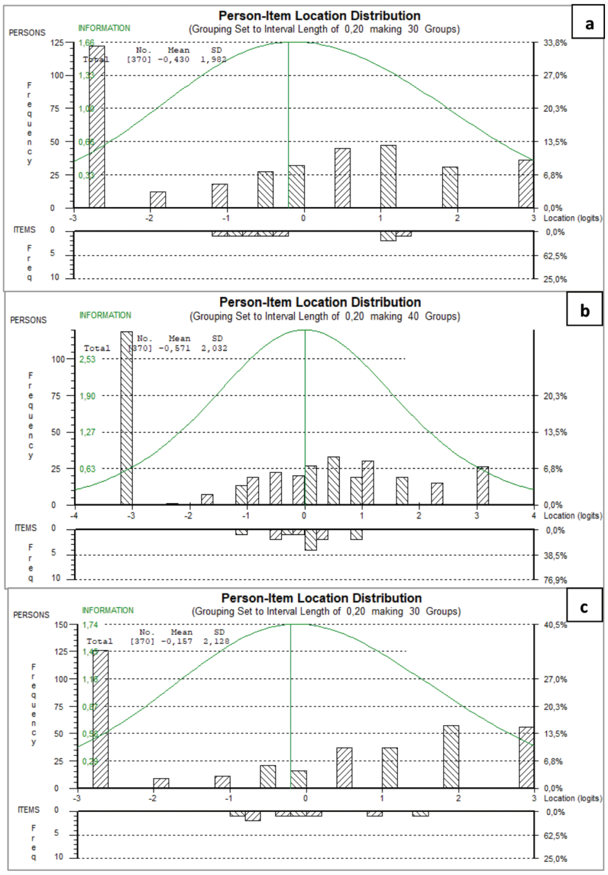

Figure 1. a, b, c. (a) Distribution of Person and Item Location Estimates of the Function/Dysfunction Subscale, (b) Distribution of Person and Item Location Estimates of the Risk/Etiology Subscale, and (c) Distribution of Person and Item Location Estimates of the Diagnose/Treatment Subscale.

dysfunctions were examined, 27% (n=100) of the participants had urinary frequency, 22.2% (n=82) of the participants had constipation, 20.5% (n=76) of the participants had urinary incontinence, 20.3% (n=75) of the participants had pelvic pain, 20.3% (n=75) of the participants had urinary urgency, 9.2% (n=34) of the participants had difficulty in urine, 7.3% (n=27) of the participants had anal incontinence, 3.5% (n=13) of the participants had pelvic organ prolapse, 2.4% (n=9) of the participants had nocturnal enuresis, and 1.6% (n=6) of the participants had sexual dysfunction.

In terms of content validity, five experts experienced in this field were consulted in our study. Experts expressed their views and opinions regarding the purpose, scope, and comprehensibility of test items and the final version of the items were attained based on their opinions.

The draft knowledge quiz was administered in 53 participants to test the clarity/readability of the items in a pilot study. Thirty-five of these participants were females, and 18 were males. Participants were asked to assess the clarity/readability of each item based on a 5-point Likert-type scoring (1: not clear at all, 2: not understandable, 3: a little understandable, 4: understandable, and 5: completely understandable). There was no problem with the clarity/readability of the items. The face validity analysis showed that all items were quite understandable since the rate of "understandable" and "completely understandable" responses ranged between 83.02% and 98.11%. The mean of these proportions was 93.61%. When the responses of the participants were checked, the rate of "I do not know" response was between 39% and 59%.

It has been recommended to reach 5-10 times the number of items in the scale to determine the sample size in validity-reliability studies in the literature (13). For this reason, it was targeted to include 10 times the number of items (37 items) in the PF-HKQ. First of all, 381 participants were enrolled in the present study. Eleven participants were excluded because they did not complete the quiz. The study was completed with 370 participants (172 females and 44 males with pelvic floor dysfunctions and 101 females and 53 males without pelvic floor dysfunctions).

Initial analysis of 37 items showed significant item-trait interaction ($p<0.001$) and that the questionnaire was not unidimensional (7.6%). Therefore, we analyzed the three subscales separately. The items in the function/dysfunction subscale showed excellent fit to the Rasch model both individually (all p-values for items $p>0.006$, Table 1) and in overall ($x2=39.932$, $df=21$, $p=0.022>0.006$). The mean residual was -0.161 ± 1.209 for items and -0.164 ± 0.850 for individuals. None of the residual correlation was above 0.30. Therefore, there was no local dependency. None of the items had a uniform or non-uniform DIF across gender and education groups. The first subscale was determined as unidimensional ($t=0.0\%$). The ceiling and floor effects were 9.7% (n=36) and 33.0% (n=122), respectively (Figure 1a). The PSI and KR-20 were calculated as 0.892 and 0.890, respectively.

Table 3: Comparisons of the PFHKQ Rasch Scores Based on the Demographic and Clinical Features.

Variables	Total PFHKQ	1st Subscale	2nd Subscale	3rd Subscale
	Median (min–max)	Median (min–max)	Median (min–max)	Median (min–max)
Health Professional or Student				
No	-0.64 (-2.33–1.85)	-1.54 (-2.79–2.86)	-1.18 (-3.10–3.10)	-1.13 (-2.71–2.82)
Yes	1.00 (-2.33–2.98)	1.17 (-2.79–2.86)	1.18 (-3.10–3.10)	1.88 (-2.71–2.82)
Z	12.217	11.299	11.926	10.493
p	<0.001*	<0.001*	<0.001*	<0.001*
Urinary Incontinence				
Absent	-0.19 (-2.33–2.98)	-0.03 (-2.79–2.86)	-0.15 (-3.10–3.10)	0.50 (-2.71–2.82)
Present	-0.19 (-2.33–2.98)	-0.59 (-2.79–2.86)	-0.47 (-3.10–3.10)	-0.04 (-2.71–2.82)
Z	1.401	1.214	1.555	0.472
p	0.161	0.225	0.121	0.637
Urinary Frequency				
Absent	-0.23 (-2.33–2.98)	-0.03 (-2.79–2.86)	-0.31 (-3.10–3.10)	-0.04 (-2.71–2.82)
Present	-0.10 (-2.33–2.98)	-0.03 (-2.79–2.86)	-0.15 (-3.10–3.10)	0.50 (-2.71–2.82)
Z	0.192	0.141	0.108	1.194
p	0.848	0.888	0.914	0.233
Urinary Urgency				
Absent	-0.19 (-2.33–2.98)	-0.03 (-2.79–2.86)	-0.15 (-3.10–3.10)	-0.04 (-2.71–2.82)
Present	-0.10 (-2.33–2.98)	-0.03 (-2.79–2.86)	-0.15 (-3.10–3.10)	0.50 (-2.71–2.82)
Z	0.105	0.003	0.112	0.818
p	0.916	0.998	0.911	0.413
Constipation				
Absent	-0.19 (-2.33–2.98)	-0.03 (-2.79–2.86)	-0.15 (-3.10–3.10)	0.50 (-2.71–2.82)
Present	-0.19 (-2.33–2.98)	-0.59 (-2.79–2.86)	-0.15 (-3.10–3.10)	0.23 (-2.71–2.82)
Z	0.873	0.988	0.789	0.801;
p	0.383	0.323	0.430	0.423
Pelvic Pain				
Absent	-0.19 (-2.33–2.98)	-0.03 (-2.79–2.86)	-0.15 (-3.10–3.10)	0.50 (-2.71–2.82)
Present	-0.19 (-2.33–2.98)	-0.59 (-2.79–2.86)	-0.15 (-3.10–3.10)	-0.04 (-2.71–2.82)
Z	1.145	1.152	1.126	0.898
p	0.252	0.249	0.260	0.369
Previous Knowledge of Pelvic Floor Dysfunctions				
No	-1.81 (-2.33–1.54)	-2.79 (-2.79–2.86)	-3.10 (-3.10–1.63)	-2.71 (-2.71–2.82)
Yes	0.60 (-2.33–2.98)	1.17 (-2.79–2.86)	0.80 (-3.10–3.10)	1.88 (-2.71–2.82)
Z	12.634	12.260	12.133	11.003
p	<0.001*	<0.001*	<0.001*	<0.001*
Previous Knowledge of PFE				
No	-0.68 (-2.33–2.31)	-1.91 (-2.79–2.86)	-1.18 (-3.10–3.10)	-1.84 (-2.71–2.82)
Yes	0.91 (-2.33–2.98)	1.17 (-2.79–2.86)	1.18 (-3.10–3.10)	1.88 (-2.71–2.82)
Z	12.097	11.538	11.535	11.048
p	<0.001*	<0.001*	<0.001*	<0.001*
Perform PFE				
No	-0.36 (-2.33–2.98)	-0.59 (-2.79–2.86)	-0.47 (-3.10–3.10)	-0.56 (-2.71–2.82)
Yes	0.75 (-0.44–2.98)	1.17 (-1.18–2.86)	0.80 (-1.63–3.10)	1.88 (-0.56–2.82)
Z	6.663	6.184	6.322	6.490
p	<0.001*	<0.001*	<0.001*	<0.001*

*p<0.05. PFHKQ: Pelvic Floor Health Knowledge Questionnaire, PFE: Pelvic floor exercise.

Items 10, 16, and 23 in the risk/etiology subscale showed misfit to the Rasch model. Deleting them one by one or in pairs did not improve the fit. Items 17 and 24 were found problematic after deleting the three items. Therefore, all five items were deleted, the remaining 13 items showed good fit (all p-values for items >0.004, Table 1) and this subscale fit the Rasch model (x2=57.076, df=39, p=0.031>0.004). The mean residual was 0.253±1.255 for items and 0.055±0.809 for individuals. None of the items had DIF or any residual correlation above 0.30. The second subscale was also unidimensional (t=0.0%). The ceiling and floor effects were 7.0% (n=26) and 32.2% (n=119), respectively (Figure 1b). The PSI and KR-20 were 0.938 and 0.920 for the risk/etiology subscale, respectively.

Items 28, 36, and 31 showed misfit to the Rasch model for the diagnose/treatment subscale. The overall and individual fit of the remaining eight items were good (x2=32.526, df=16, p=0.009>0.006, and all p-values for items >0.006 in Table 1). The mean residual was -0.262±1.252 for items and -0.165±0.779 for individuals. There were no local dependency and no DIF across gender and education groups. Unidimensionality was held for the third subscale (t=0.0%). The ceiling and floor effects were 15.1% (n=56) and 34.1% (n=126), respectively (Figure 1c). The PSI and KR-20 were 0.912 and 0.924 for diagnosing/treatment subscale, respectively.

The person knowledge calibration ranged through [-3,3]. The items' difficulties were between -1.5 and 1.5 for function/dysfunction subscale (Figure 1a), -1.5 and 1 for risk/etiology subscale (Figure 1b), and -1 and 2 for diagnosis/treatment subscale (Figure 1c).

The items were found generally to be proper to the individuals with a moderate level of knowledge.

After showing that all three subscales fit the Rasch model, another Rasch analysis was performed by bundling the items in each subscale and treating three subscales as three items. The individual residual was ±2.5, and the item-trait interaction was insignificant (x2=8.268, df=9, p=0.507>0.017, Table 1). All residual correlations were negative. Therefore, there was no local dependency. The proportion of significant paired t-test was 1.6% (95% CI 0.3%-2.9%), i.e., the three subscales showed a unidimensional structure. The ceiling and floor effects were 3.2% (n=12) and 30.3% (n=112), respectively. The PSI and KR-20 were 0.952 and 0.926 for the PFHKQ, respectively. The Raw score-Rasch score transformation for PFHKQ total and subscales is given in Table 2.

The median total Rasch score for the PFHKQ was 1.00 (min-max -2.33–2.98) in health professionals/students, and -0.64 (min-max -2.33–1.85) in the other participants (Table 3). The former was found to have a significantly higher score than the latter (p<0.001). Health professionals/students had higher Rasch scores in all subscales (p<0.001). The individuals who had heard any pelvic floor dysfunctions before had significantly higher Rasch scores for total and subscales compared to the others (p<0.001). Similarly, the individuals who knew or performed PFE had significantly higher Rasch scores for total and subscales compared to the others (p<0.001). However, there was no difference in Rasch scores for the PFHKQ and its subscales between the individuals with and without pelvic floor dysfunctions including urinary incontinence, urinary frequency, urinary urgency, constipation and pelvic pain (p>0.05).

DISCUSSION

In this study, the PFHKQ that was developed in Turkish to evaluate the level of knowledge about pelvic floor health was found to be valid and reliable.

It is essential to analyze the validity and reliability of a newly developed scale. A pilot group was carried out to test the comprehensibility of the PFHKQ items. As a result, the items of the PFHKQ were found to be sufficiently relevant, clear, and readable. Standard assessments are widely used in health care both in clinical and research contexts. The Rasch model is a widely used method for the evaluation and development of assessment tools (14). It not only provides the conversion of an ordinal score to a variable at the linear or interval level but also evaluates the internal structure validity of these evaluations (12). The main feature of an ordinal assessment tool is that the distances between the raw scores are not equal, and the mathematical calculations are invalid (12). In our study, the PFHKQ is a test that measures three sub-dimensions as function/dysfunction, risk/etiology, and diagnosis and treatment and consists of 29 items according to the Rasch analysis (Appendix). The items in the sub-dimensions of this test fit with each other adequately.

According to the known-group validity analysis, the PFHKQ and sub-dimension knowledge levels were higher in health workers/students, in those who had heard about pelvic floor dysfunctions, in those who knew about PFE, and in those who practiced the PFE. Becoming health students/workers and knowing or practicing the PFE may have been caused by their increased knowledge and awareness about the subject. Moreover, in this sample, the PFHKQ and the sub-dimension scores were similar in those with and without pelvic floor dysfunctions (urinary incontinence, urinary frequency, pelvic pain, constipation, and urinary urgency). These results may be because society does not naturally accept them. They are assumed as a cause of shame, and also may be due to the low level of education. In addition, this study was applied to individuals with and without pelvic floor dysfunctions. In the sample of the study, it was observed that the individuals had the most urinary incontinence, urinary frequency, urinary urgency, constipation and pelvic pain. No difference was found between the level of knowledge about pelvic floor health in patients with any pelvic floor dysfunction or healthy individuals. It may be because pelvic floor dysfunctions are an embarrassed and neglected issue.

Additionally, the examination of floor and ceiling effects has been vital in terms of quality criteria in the development of a test/questionnaire/scale, (15). Floor effect is not more than 15% of the lowest scores in the scale and ceiling effect is determined not to exceed 15% of the people with the highest score in the scale (16). If floor or ceiling effects are present, the test is assumed to be composed of very easy or complicated items, indicating that the content validity is poor. Individuals with the lowest or highest possible scores should be distinguished in terms of the subject being measured, so reliability gets reduced (15). In this study, the percentage of those who received "0" floor points from the PFHKQ and its sub-dimensions is above 30%, and the ceiling scores were not 15% or less, suggesting that pelvic floor health in this population is generally related to the low level of knowledge. Kahyaoğlu Süt et al. (17) stated that women in the Turkish population had no knowledge about PFE and that they had insufficient knowledge about urinary incontinence. Ekin et al. (18) also found that 7.3% of the Turkish women had no knowledge of PFE, and 17.6% of the female patients were not informed about the issue by any health care professional. In addition, 82% of the women in the Turkish community never heard of PFE. In our study, the rate of participants who answered "I do not know" to PFHKQ items was relatively high and ranged between 39% and 59%. These results indicated that the knowledge level of the Turkish population regarding pelvic floor and pelvic floor health is generally insufficient.

The items in the PFHKQ were found generally to be proper to the individuals with a moderate level of knowledge. Usually, there should be items corresponding to each level of knowledge (15). Based on the graphics, there were no items suitable for people in extreme places. The highest level of responses was probably those of the healthcare professional or students. Since the knowledge level is deficient, the items could generally be said to be suitable for the knowledge level of the people.

Reliability analysis is used to determine whether the scale consistently measures at other times under the same condition, or if there is a consistency between scale items. In particular, in internal consistency analysis of knowledge tests, it is recommended to calculate the KR-20 value. The closer it is to "1", the higher the consistency between the items that measure the same value (19). The PSI is an indicator of how much we could rely on compliance statistics. If the PSI is high, the compliance statistics generated could be considered more reliable. The strength of the compliance test is a visual representation of the PSI. A minimum PSI of 0.70 is accepted. The value indicates that it could statistically differentiate between two patient groups (20). We found that the reliability coefficient of the PFHKQ and its sub-dimensions were more significant than 0.80 for both PSI and the KR-20 internal consistency. These findings showed that the PFHKQ and its sub-dimensions were consistent with each other and had high reliability.

The limitation of this study was that no participants with a raw score of ±3.0 were found in this study group. It might be due to the insufficient level of knowledge about the topic or improbable sampling method used in the study. In the current study, the PFHKQ developed was administered in Turkish people over 18 years of age. However, pelvic floor dysfunctions are seen quite frequently in adolescents at a rate of 23.7% (21). Whether the addition of new items which discriminate the individuals with the lowest level of knowledge to reduce the floor effect warrants further study, the items to discriminate the individuals with a higher level of knowledge could be added to increase the representation of the test for the whole population. A knowledge test could be developed for individuals under 18 years of age to evaluate the level of knowledge related to pelvic floor health.

In conclusion, this is the first study in which a quiz evaluating the pelvic floor health knowledge in detail was developed. According to the findings, the PFHKQ was found to be a valid and reliable tool in the Turkish people. Evaluating the pelvic floor health knowledge using this tool is very important for creating relevant training and exercise programs as part of preventive health care.

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Ethics: The study was approved by the Ethics Committee of Ankara Yıldırım Beyazıt University (Approval Date: 10.10.2018 and Approval Number: 20)

Informed Consent: Written informed consent of all participants was obtained.

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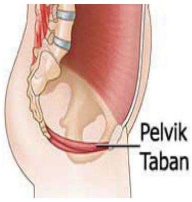
APPENDIX

PELVİK TABAN SAĞLIĞI BİLGİ TESTİ

Açıklama: Pelvik taban, leğen kemiğinin alt tarafında yerleşim gösteren bir yapıdır. Bu yapı kadınlarda idrar torbası, rahim ve kalın barsak ile, erkeklerde idrar torbası, prostat bezi ve kalın barsak ile komşudur.



Aşağıda pelvik taban sağlığına yönelik bazı ifadeler bulunmaktadır. Lütfen pelvik taban sağlığı ile ilgili aşağıdaki ifadeleri dikkatli bir şekilde okuyunuz. Her bir ifadeyi okuduktan sonra, bu ifadeyi doğru buluyorsanız “Evet”, yanlış buluyorsanız “Hayır”, bu ifade hakkında herhangi bir fikriniz yoksa “Bilmiyorum” cevabının altına “X” işareti ekleyiniz.

Maddeler	Evet	Hayır	Bilmiyorum
1. İdrar kaçırma, bir pelvik taban problemidir.			
2. Pelvik organ (idrar torbası, rahim, barsak) sarkması pelvik taban problemlerinden biridir.			
3. Dışkı veya gaz kaçırma, bir pelvik taban problemi değildir.			
4. Pelvik taban gerginliği, pelvik ağrının (leğen bölgesindeki bir ağrının) nedeni olabilir.			
5. Pelvik taban problemleri bel ağrısı ile ilişkili değildir.			
6. Pelvik taban cinsel sağlıkta önemlidir.			
7. Pelvik taban, solunum sistemi ile ilişkilidir.			
8. Pelvik taban zayıflığı pelvik ağrıya neden olabilir.			
9. Pelvik taban problemlerinin birçok sebebi olabilir.			
10. Gebelik, pelvik tabanı olumsuz etkileyebilir.			
11. Çok kez normal (vajinal) doğum yapmak pelvik tabanı zayıflatabilir.			
12. Aşırı şişman bireylerde pelvik taban problemlerinin görülme olasılığı düşüktür.			
13. Sigara bağımlılığı, pelvik tabanı zayıflatabilir.			
14. Sürekli ağırlık taşıma pelvik tabana zarar verebilir.			
15. Kabızlık pelvik tabanın zayıflamasına neden olabilir.			
16. Pelvik taban problemleri gençlerde yaşlılara göre daha fazla görülebilir.			
17. Bilinçsizce yapılan zorlayıcı sporlar/egzersizler (zıplama, halter kaldırma gibi) pelvik tabanı zayıflatabilir.			
18. Duruş bozukluğu pelvik tabanı etkilemez.			
19. Menopoz, pelvik taban problemlerini etkileyebilir.			
20. Bazı ilaçlar, pelvik taban problemlerine neden olabilir.			
21. Pelvik organlarla (idrar torbası, prostat bezi, rahim...) ilgili cerrahi yaklaşımlar pelvik tabanı zayıflatabilir.			
22. Pelvik taban problemlerini belirlemede hasta muayenesi önemlidir.			
23. Pelvik taban problemlerini belirlemede bazı özel testler kullanılır.			
24. Pelvik taban problemlerinde klinik muayenenin yanında hastanın şikâyeti de önemlidir.			
25. Pelvik taban egzersizleri, pelvik taban problemlerini önleyebilir.			
26. Fizik tedavi, pelvik taban problemlerinin tedavisinde kullanılabilir.			
27. İlaç kullanımı, pelvik taban problemlerinde tek tedavi yöntemidir.			
28. Ameliyat, pelvik taban problemlerinde kesin çözüm olmayabilir.			
29. Düzenli yapılan fiziksel aktivite ve egzersiz pelvik taban problemleri için yararlıdır.			