ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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Reliability and Validity of Turkish Version of the Self-administered Foot Health Assessment Instrument

Kendi Kendine Ayak Sağlığı Değerlendirme Aracının Türkçe Geçerlik-Güvenirlik Çalışması

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ABSTRACT Objective: This study aimed to examine the Turkish validity and reliability of the Self-Foot Health Assessment Tool. **Material and Methods:** This study was planned as a methodological type study. This study was conducted with 220 nurses working in different units in Ordu State Hospital and Ministry of Health Ordu University Training and Research Hospital. In addition to the Self-administered Foot Health Assessment Instrument, a personal information form was used to collect the demographic information from voluntarily participating 220 nurses. In the validity study of the scale, the content validity index was used to evaluate language validity, content validity, construct validity and expert opinion. In the reliability study of the scale, the Cronbach's alpha coefficient calculation, item analysis and confirmatory factor analysis were used to determine the internal consistency. **Results:** The average age was 36.75±8.61 years, average working experience years as a nurse was 14.32±9.56, and the average working duration in the same service was 4.97±5.66 years. After the language equivalence of the scale was achieved, the content validity index was calculated. The Kuder-Richardson 21 coefficient was calculated as 0.784 for skin health, 0.774 for nail health, and 0.626 for foot anatomy. The content validity index score was 0.959 (excellent level). The overall internal consistency coefficient of the scale was between 0.851-0.929. Average varience extracted value was 0.404 and composite reliability value was calculated as 0.942. **Conclusion:** Participation of healthy/patients individuals that nurses provide care is very important. It has been determined that the Turkish version of the Self-Foot Health Assessment Tool, which can be effective in providing and evaluating the self-care of individuals, is a valid and reliable tool and can be used safely by individuals in self-evaluation of foot health.

Keywords: Foot health; reliability; self-assessment; validity

ÖZET Amaç: Bu çalışma, Kendi Kendine Ayak Sağlığını Değerlendirme Aracının Türkçe geçerlik ve güvenirliğinin incelenmesi amacıyla gerçekleştirilmiştir. **Gereç ve Yöntemler:** Çalışma, metodolojik türde gerçekleştirilmiştir. Çalışma, Ordu Devlet Hastanesi ve Sağlık Bakanlığı Ordu Üniversitesi Eğitim ve Araştırma Hastanesinin farklı bölümlerinde çalışan 220 hemşire ile yürütülmüştür. Araştırma verilerinin toplanmasında "Kişisel Bilgi Formu" ve "Kendi Kendine Ayak Sağlığı Değerlendirme Aracı" kullanılmıştır. Ölçeğin geçerlilik çalışmasında dil eş değerliliği, kapsam geçerliliği ve yapı geçerliliği, uzman görüşünün değerlendirilmesinde içerik geçerlilik indeksi kullanılmıştır. Ölçeğin güvenirlilik çalışmasında, iç tutarlılığını belirlemek için Cronbach alfa değeri katsayısının hesaplanması, madde analizleri ve doğrulayıcı faktör analizi yöntemlerinden yararlanılmıştır. **Bulgular:** Araştırmaya katılan hemşirelerin yaş ortalaması 36,75±8,61 yıl, hemşire olarak çalışma süresi ortalaması 14,32±9,56 yıl, bulunduğu serviste çalışma süresi ortalaması 4,97±5,66 yıldır. Ölçeğin "Kuder-Richardson 21" katsayısı; cilt sağlığı için 0,784, tırnak sağlığı için 0,774 ve ayak yapısı için 0,626 olarak hesaplandı. Ölçeğin kapsam geçerlik indeksi puanı 0,959 (mükemmel düzeyde) olarak belirlendi. Ölçeğin genel iç tutarlılık katsayısının (Cronbach alfa) 0,851-0,929 arasında olduğu saptandı. Açıklanan ortalama varyans değeri 0,404 ve bileşik güvenilirlik değeri ise 0,942 olarak hesaplanmıştır. **Sonuç:** Hemşirelerin bakım vermekte olduğu sağlıklı/hasta bireylerin, bakıma katılımları oldukça önemlidir. Bireylerin kendi bakımlarını sağlamada ve değerlendirmede etkili olabilecek Kendi Kendine Ayak Sağlığını Değerlendirme Aracının Türkçe versiyonunun geçerli ve güvenilir bir araç olduğu ve bireylerin kendi kendine ayak sağlıklarını değerlendirmede güvenli bir şekilde kullanabileceği saptanmıştır.

Anahtar Kelimeler: Ayak sağlığı; güvenirlik; öz değerlendirme; geçerlik

With the increased life expectancy, the rate of foot problems associated with obesity, diabetes Mellitus, vascular diseases, inactivity, and physical injuries gradually increase. Foot health is a very important factor in preventing musculoskeletal diseases and the likelihood of a foot health problem among in-

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dividuals is unquestionably high.[1] Studies revealed that 30% of individuals have complaints about their foot health, especially foot pain.[2-4] In a report published by the Institute for Preventive Foot Health in 2012, it was stated that 78% of individuals older than 21 years have foot health problems.[5] World Health Organization also emphasized the importance of foot health in preventing falls in elderly individuals in a report dated in 2007.[6]

With aging, the frequency of foot-related health problems in the elderly individuals increases due to changes in the foot anatomy.[7-9] For this reason, self-evaluation of the foot health without being dependent on others is important in maintaining foot health and early diagnosis of possible foot health problems.[10-12]

As the number of diabetes mellitus patients increases in the world, the foot care is very important for diabetic foot complaints, which are among the most common complications of diabetes and have a high possibility to reoccur. The most significant attempt to prevent the development of diabetic foot problems is to raise awareness in individuals and to ensure that they self-care their foot and apply to a health institution in case of the slightest change in their foot health.[13,14]

Foot health is very important in maintaining the general health of all individuals living in the community and in improving health. Healthy feet are effective in the individual's ability to perform daily life activities independently and keep their comfort at a high level. In the studies conducted, it has been determined that the problems experienced by the individuals regarding the feet gradually increase. The most effective method that can be done primarily for the problems experienced by individuals in their feet is primarily to evaluate their own foot health. It is very important for the individual to be involved in his/her own care in protecting and improving the health of the individual we care for as a nurse. In this context, valid and reliable tools are needed for individuals to evaluate their own health. The number of available studies in the literature is very few and these studies are predominantly on the diabetic foot. For this reason, the purposes of this study were to ensure the Turkish equivalence of "Self-administered Foot Health Assessment Instrument (S-FHAI)" and to determine its validity and reliability, so that a healthy/patient individual can evaluate their own foot health without the need for others.

MATERIAL AND METHODS

DESIGN OF RESEARCH

This methodological study was planned to verify the validity and reliability of the translated Turkish version of the the S-FHAI.[15]

PARTICIPANTS

The research population consisted of nurses who had been different units working in two public hospitals. Validity and reliability studies remarked that participants that were five to ten times the number of items should serve as an enough sample size. Since the scale consisted of 22 items, the study was completed with 220 nurses, 10 times the number of items.[16] A simple random sampling method was used for sample selection.

STUDY TOOLS

The researchers collected the data for study from hospitals between September 2019 and February 2020. Personal information form for sociodemegraphic data and the "S-FHAI" for nurses were used as data collection instrument.

Personal Information Form

This form prepared by the researchers in the light of the literature consists of eight questions about the nurse's age, gender, chronic disease status, previous problems with foot health, working experience.[9-15]

Self-administered Foot Health Assessment Instrument

S-FHAI, developed by Stolt et al. in 2015, is a tool that allows individuals to evaluate their foot health without requiring a specialist.[15] The scale has 4 categories and 22 questions. Skin health is evaluated in the 1st category (11 items), toenail health in the 2nd category (5 items), foot structure in the 3rd category (5 items), and foot pain in the 4th category (2 items). Participants give "Yes" or "No" answers to each ques-

tion, except for the last item (item no. 22), for which a 5-point Likert scale (0=no pain, 4=the worst pain imaginable) was used to measure the pain level.

ETHICAL CONSIDERATION

Firstly, we have contracted with Minna Stolt, developer of the scale, via e-mail and written permission was obtained to adapt the scale to Turkish. Institutional permissions were received permission from the faculty of health sciences, where the research data were collected, and from the provincial health directorate to which the hospitals, where the nurses worked for, are affiliated. The study complied with the Helsinki Declaration principles. Besides, ethical approval was received from clinical research ethics committee of Ordu University (approval no. 2019/134). We informed the nurses, who voluntarily participated in the study, about the objectives and benefits of the study along with their roles, and each participant gave written and verbal consent.

STATISTICAL ANALYSIS

IBM Statistical Package for the Social Sciences 22 (SPSS 22) and SPSS AMOS 22 (IBM SPSS, Turkey) were used for statistical analyses, and the descriptive statistical methods (median, mean, standard deviation, percentage, frequency) were used for data interpretation. In addition, the normal distribution compatibility of the parameters was assessed using a Kolmogorov Smirnov test, histograms and Q-Q plots. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to identify the validity of the scale. In the reliability analysis, Cronbach's alpha coefficients for internal consistency and Pearson correlation analysis for item-total score correlation were used. Intra-class correlation coefficients were calculated to check retest reliability. The significance level was set at $p<0.05$.

LANGUAGE VALIDITY

This section consists of three stages: translation, back translation and equivalence in translation. Translation validity has not been made since it will not be possible to create an example that knows both languages and it is not mandatory in language validity studies.[16-18]

Translation of the Scale Into Turkish

Primarily, three people who are experts in their fields and have a well command of English translated the tool separately. Therefore, S-FHAI was translated into Turkish by two bilingual experts and researchers.

Reviewing and Comparing Translations

Then, the S-FHAI forms, were brought together and assessed in terms of linguistics and the appropriateness of the expressions by bilingual experts and researchers. All translations were compared and no linguistic and semantic differences were observed. Then the draft form was obtained. The draft form was submitted for expert opinion.

Back Translating the Inventory From Turkish Into English

The final, items of the Turkish S-FHAI were back-translated into English by two people who know English and English culture as well as the Turkish language. Then, the original instrument was compared with the back-translated instrument by Stolt. After comparison, the approval of the relevant author was obtained.

CONTENT VALIDITY

In this study, the content validity of the scale adapted to Turkish was tested with this method using the "Content Validity Index (CVI)". After translation, seven experts in their field were asked to evaluate the S-FHAI in terms of language and content validity. They were asked to assess whether the expressions are understandable and suitable for the Turkish culture by scoring the accuracy, clearness, and preciseness of each expression with 1-4 points (1=not suitable, 2=slightly suitable, 3=quite suitable and 4=perfectly suitable) following the Davis' technique. They were also asked to write their suggestions in a specified section. The items were changed according to the scores of each faculty member. CVI was calculated by splitting the total scores of each item by the total number of experts.[19,20]

CONSTRUCT VALIDITY

In this study, EFA and CFA were performed on the collected data to determine the construct validity of the scale. Before the factor analyses, the The Kaiser-Mayer-Olkin (KMO) value and the results of Bartlett test were used for the qualification of the sample.

RELIABILITY

In reliability analysis, the Kuder-Richardson 21 (KR-21) and Cronbach's alpha coefficient was used for internal consistency analysis, and Pearson's correlation coefficient was used for the item's total score correlation. In addition, the average variance Average Variance Extracted (AVE) value explained, as well as the item factor loadings determined in the factor analysis, were examined to reveal the convergent validity. Then, Composite Reliability (CR) coefficients were examined for the combined reliability.[21,22] In our study, Ave value of the scale was 0.404 CR value was calculated as 0.942.

RESULTS

CHARACTERISTICS OF PARTICIPANTS

The participants were mostly female (86.4%), had a bachelor's degree (69.5%), had not chronic disease (77.7%). The average age was 36.75±8.61 years, average working experience years as a nurse was 14.32±9.56, and the average working duration in the same service was 4.97±5.66 years (Table 1).

TABLE 1: Sociodemographic information.

Nurses		Minimum-Maximum	Mean±SD (Median)
Age (year)		20-59	36.76±8.61 (39)
Total working experience as a nurse (year)		1-40	14.32±9.56 (13)
Total working duration in the current service (year)		1-35	4.97±5.66 (3)
Gender	Female	190	86.4
	Male	30	13.6
Education	High school	13	5.9
	Undergraduate	33	15.0
	Graduate	153	69.5
	Post-graduate	21	9.5
Chronic disease	Yes	49	22.3
	No	171	77.7
Previous problems regarding foot health	Yes	67	30.5
	No	153	69.5

SD: Standard deviation.

RELIABILITY OF THE TURKISH VERSION OF THE SELF-ADMINISTERED FOOT HEALTH ASSESSMENT INSTRUMENT

The nurses' item analysis and internal consistency coefficients for the S-FHAI are given in Table 2. The item-total correlations were higher than the accepted value (it is expected to be higher than 0.200).[19] In scale adaptation studies, it is recommended to calculate the average variance AVE value.[21] Cronbach's Alpha and CR values are ≥0.70; AVE value is expected to realize as ≥0.40.[22]

In evaluating the internal consistency of the scale, the consistency was evaluated by using the KR-21 coefficient, since the items related to skin health, teonail health, and foot structure of the S-FHAI are binary variables. The KR-21 coefficient was calculated as 0.784 for skin health, 0.774 for nail health, and 0.626 for foot anatomy. KR-21 coefficients indicate that internal consistency is good. As the pain severities were evaluated with a 5-point Likert scale, Cronbach's α internal consistency coefficient was used in the assessment of the internal consistency of the pain locations and it was found that the Cronbach's α has a quite high of 0.929.[10,23]

VALIDITY OF THE TURKISH VERSION OF THE SELF-ADMINISTERED FOOT HEALTH ASSESSMENT INSTRUMENT

Content Validity

Content Validity procedures and CVI values were explained under the Content validity of the S-FHAI subsection.

Table 3 shows the distribution of the nurses' answers to the S-FHAI. In terms of foot skin health, skin rash or softening between the fingers were detected in 24.5% (n=54) of the nurses, dry skin in 45% (n=99), cracked heels in 50% (n=110), calluses in 31.8% (n=70), warts in 9.5% (n=21), blisters in 19.5% (n=43), edema in 35.5% (n=78), sweating in the feet in 31.4% (n=69), burning in the feet in 31.8% (n=70), cold feet in 38.2% (n=84), and leg cramps in 55.5% (n=122) of the nurses. In terms of nail health, ingrown toenail was detected in 25% (n=55) of the nurses, thickening of the nails in 30% (n=66), color change in the nails in 22.3% (n=49), and fungal infection in the nails in 20.5% (n=45) of the nurses. In terms of foot anatomy, hallux valgus was seen in 15.5% (n=34) of the nurses, Taylor's Bunion deformity in 14.1% (n=31), small finger deformities in 18.6% (n=41), drop foot in 5.5% (n=12), and cavus foot in 2.7% (n=6) of the nurses. One hundred eight-

TABLE 2: Expert opinions and content validity results for the Self-administered Foot Health Assessment Instrument.

Items	Not appropriate	Slightly appropriate	Quite appropriate	Perfectly appropriate	Content validity index
Item 1	1	0	0	6	0.857
Item 2	0	1	1	5	0.857
Item 3	0	0	0	7	1.000
Item 4	0	0	0	7	1.000
Item 5	0	1	0	6	0.857
Item 6	0	0	0	7	1.000
Item 7	0	0	0	7	1.000
Item 8	0	0	0	7	1.000
Item 9	0	0	0	7	1.000
Item 10	1	0	2	4	0.857
Item 11	0	0	0	7	1.000
Item 12	0	0	1	6	1.000
Item 13	0	0	2	5	1.000
Item 14	0	0	0	7	1.000
Item 15	0	1	2	4	0.857
Item 16	0	0	2	5	1.000
Item 17	0	0	2	5	1.000
Item 18	0	1	2	4	0.857
Item 19	0	1	2	4	0.857
Item 20	0	0	1	6	1.000
Item 21	1	0	0	6	0.857
Item 22.1	0	0	2	5	1.000
Item 22.2	0	0	2	5	1.000
Item 22.3	0	0	1	6	1.000
Item 22.4	0	0	1	6	1.000
Item 22.5	0	0	1	6	1.000
Item 22.6	0	0	1	6	1.000
Item 22.7	0	0	1	6	1.000
TOTAL	3	5	26	162	0.959

Expert opinion evaluation: (1): Not appropriate; (2): Slightly appropriate; (3): Quite appropriate; (4): Perfectly appropriate content validity index=(3)+(4)/Number of experts.

een (53.6%) nurses reported that they had foot pain in the last two weeks. The mean pain severity of the nurses was 1.51±0.91 (M=1) for toes, 1.90±1.14 (M=1) for the sole, 1.75±1.05 (M=1) for the heel, 1.85±1.18 (M=1) for ankle, 1.80±1.11 (M=1) for the knee, 1.73±1.11 (M=1) for the thigh, and 1.72±1.10 (M=1) for the hip.

Construct Validity

EFA and CFA were used to stated the construct validity of the S-FHAI.

Exploratory Factor Analysis

KMO sample adequacy value of the nurses for the S-FHAI was 0.826, which proves that the study sample is enough for the EFA. The Bartlett's test of sphericity result (χ^2=2835.826; df=351, p=0.001) was statistically significant, which shows that the data are suitable for the EFA.[23]

A varimax rotation was used in the EFA, and Principal Component Analysis (PCA) was used for extraction. PCA with varimax rotation revealed seven components that have an eigenvalue bigger than one (range 1.005-7.125). However, since the original scale had four dimensions, and four components were supported by the Scree plot, the EFA was performed with four components.[24] The analysis revealed that the first factor explains 19.58% of the total variance; whereas the sum of two factors explains 32.6% of the

TABLE 3: Item analysis results for the Self-administered Foot Health Assessment Instrument.

	Frequency			
	Yes	No		Internal consistency
Items	n (%)	n (%)	Item-total correlation	coefficient (KR-21)
Skin Health			0.386	0.784
M1: Skin rash or softening between the fingers	54 (24.5)	166 (75.5)	0.440	
M2: Dry skin	99 (45)	121 (55)	0.562	
M3: Cracked heels	110 (50)	110 (50)	0.476	
M4: Calluses	70 (31.8)	150 (68.2)	0.504	
M5: Warts	21 (9.5)	199 (90.5)	0.447	
M6: Blisters	43 (19.5)	177 (80.5)	0.483	
M7: Edema	78 (35.5)	142 (64.5)	0.454	
M8: Sweating in the feet	69 (31.4)	151 (68.6)	0.423	
M9: Burning in the feet	70 (31.8)	150 (68.2)	0.228	
M10: Cold feet	84 (38.2)	136 (61.8)	0.469	
M11: Leg cramps	122 (55.5)	98 (44.5)		
Nail Health			0.384	0.774
M12: Ingrown toenail	55 (25)	165 (75)	0.679	
M13: Thickening of the nails	66 (30)	154 (70)	0.730	
M14: Color change in the nails	49 (22.3)	171 (77.7)	0.545	
M15: Fungal infection in the nails	45 (20.5)	175 (79.5)		
Foot Structure			0.349	0.626
M16: Hallux valgus	34 (15.5)	186 (84.5)	0.538	
M17: Taylor's bunion deformity	31 (14.1)	189 (85.9)	0.448	
M18: Small finger deformities	41 (18.6)	179 (81.4)	0.338	
M19: Drop foot	12 (5.5)	208 (94.5)	0.296	
M20: Cavus foot	6 (2.7)	214 (97.3)		
Foot Pain			-	-
M21: Foot pain in the last two weeks	118 (53.6)	102 (46.4)	-	-
	The severity of the pain			
Place of pain	Minimum-Maximum	Mean±SD (Median)		
M22.1: Toes	1-5	1.51±0.91 (1)	0.647	
M22.2: Sole	1-5	1.90±1.14 (1)	0.819	
M22.3: Heel	1-5	1.75±1.05 (1)	0.798	0.929
M22.4: Ankle	1-5	1.85±1.18 (1)	0.799	
M22.5: Knee	1-5	1.80±1.11 (1)	0.752	
M22.6: Thigh	1-5	1.73±1.11 (1)	0.816	
M22.7: Hip	1-5	1.72±1.10 (1)	0.790	

SD: Standard deviation.

total variance, the sum of three factors 42.86% of the total variance, and the sum of four factors explain 51.73% of the total variance.

The factor loadings of the scale items were calculated after EFA and provided in Table 4. In general, the factors were found to match with their original dimensions. However, "M1: Skin rash or softening between the fingers", "M2: Dry skin", "M10: Cold feet" and "M11: Leg cramps" items were found to be different from their projected dimension. The factor loadings of "M11: Leg cramps" items were found to be negative. Since it has an inverse relationship with the overall measurement tool, this item will be excluded and not be used in the subsequent evaluations.

Confirmatory Factor Analysis

The model fit of the item-factor structure obtained in the EFA was examined with CFA. Thus, it will be de-

TABLE 4: Factor loadings obtained after exploratory factor analysis.

Items	Factor 1	Factor 2	Factor 3	Factor 4
Skin Health				
M1: Skin rash or softening between the fingers	-0.051	0.558	0.270	0.134
M2: Dry skin	-0.249	0.544	0.155	-0.043
M3: Cracked heels	-0.361	0.206	0.583	-0.003
M4: Calluses	-0.103	0.299	0.427	0.309
M5: Warts	0.012	0.229	0.561	0.403
M6: Blisters	-0.125	0.162	0.674	-0.042
M7: Edema	-0.302	0.040	0.647	0.068
M8: Sweating in the feet	-0.176	0.268	0.429	0.167
M9: Burning in the feet	-0.105	0.295	0.540	-0.105
M10: Cold feet	-0.155	0.414	-0.175	0.286
M11: Leg cramps	-0.387	0.317	0.212	0.169
Nail Health				
M12: Ingrown toenail	-0.041	0.496	0.205	0.124
M13: Thickening of the nails	-0.140	0.806	0.065	0.035
M14: Color change in the nails	-0.081	0.783	0.213	-0.057
M15: Fungal infection in the nails	0.051	0.682	0.284	-0.145
Foot Structure				
M16: Halluks valgus	-0.136	-0.010	-0.102	0.576
M17: Taylor's bunion deformity	-0.080	0.224	-0.064	0.727
M18: Small finger deformities	-0.088	0.345	0.039	0.623
M19: Drop foot	0.066	-0.160	0.270	0.580
M20: Cavus foot	0.043	-0.188	0.214	0.517
Foot Pain				
M22.1: Toes	0.690	-0.120	-0.105	-0.024
M22.2: Sole of the foot	0.866	-0.120	-0.125	0.034
M22.3: Heel	0.843	-0.131	-0.123	0.067
M22.4: Ankle	0.860	-0.018	-0.117	0.024
M22.5: Knee	0.785	-0.081	-0.153	-0.183
M22.6: Thigh	0.842	-0.057	-0.137	-0.107
M22.7: Hip	0.828	-0.080	-0.095	-0.124
Eigenvalues	7.125	3.170	2.158	1.513
Explained variance (%)	26.389	11.742	7.993	5.605
Cumulative explained variance (%)	26.389	38.132	46.124	51.730

Values written in bold indicate that the highest Factor load of an Item is in the theoretical dimension.

termined whether the factor structure of the original form of the scale will be verified in the Turkish sample.

The indices and corresponding threshold values, used in the CFA of nurses, was used for this analysis as well.

Fit indices of the four-factor model of the Turkish form were examined in the CFA. Table 5 shows that the S-FHAIs fit indices are significant (p=0.001). The fit index values were normed chi-square=2.998, goodness-of-fit index=0.754, root mean square error of approximation=0.096, comparative fit index=0.769, normed fit index=0.693, relative fit index=0.659, and incremental fit index=0.772. In the CFA analysis, a modification was made between the "sweating in the feet and cold feet" questions in the skin health dimension, between "thigh and hip", "sole and heel", "knee and hip" questions in the foot pain dimension. It was found that the fit indices of the model had a moderate validity after modification.[25] Information on the path diagram and factor loadings of the verified model can be found in Figure 1.

TABLE 5: Confirmatory factor analysis results.

Indices	Before Modification (χ^2=564.953/dof=269)**	Before Modification (χ^2=878.401/dof=293)**	After Modification (χ^2=653.826/dof=288)**
NC	2.100	2.998	2.270
GFI	0.836	0.754	0.813
RMSEA	0.071	0.096	0.076
CFI	0.747	0.769	0.856
NFI	0.616	0.693	0.771
RFI	0.571	0.659	0.742
IFI	0.754	0.772	0.858

χ^2: Chi-square Fit Test; dof: Degree of freedom; **p<0.01; NC: Normed Chi-square; GFI: Goodness-of-fit Index; RMSEA: Root Mean Square Error of Approximation; CFI: Comparative Fit Index; NFI: Normed Fit Index; RFI: Relative Fit Index; IFI: Incremental Fit Index.

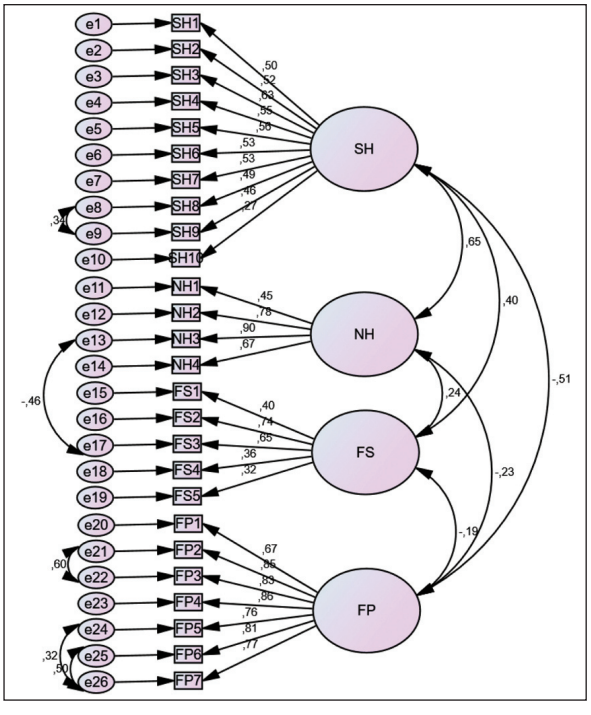

FIGURE 1: Confirmatory Factor Analysis path diagram for research.
SH: Skin Health, NH: Nail Health, FS: Foot Structure, FP: Foot Pain.

DISCUSSION

Foot related health problems of individuals are increasing each day across the world.[9] Self-evaluation of foot health is very important in preventing this avoidable problem. For this reason, the present study was carried out to adapt the original English S-FHAI to Turkish, and to test the reliability and validity of Turkish version.

It was found that the nurses included in the study generally had problems with foot health and among these problems were softening in the heels, leg cramps and foot pain. In a study in which Stolt et al. evaluated the foot health of nurses, nurses mostly experienced dry skin, calluses, cold feet, leg cramps and swelling in the feet, while Mølgaard et al. and Thomas et al. reported that individuals mostly found that they suffered from foot pain.[15,26,27] On the other hand, O'Connor et al. found that individuals mostly suffer from calluses on their feet in their study with a general population.[28] This finding of the study differs from similar study findings in the literature. He suggested that this difference might be related to the different regions in which the studies were conducted, and that individual characteristics might be effective in making a difference.

The CVI should be at least 0.80 in studies examining the validity and reliability of a scale. Seven academics expert reviewed the Turkish version of S-FHAI and the CVI score was found to be 0.959, which corresponds to "perfect". Therefore, the results of the study show that the scale items were acceptable from the point of language and content validity. Therefore, the results of the study point out that the scale items were appropriate in terms of language and content validity.

A factor analysis was performed to determine whether scale items would be collected. The EFA and CFA was used to test the construct validity of the Turkish version of S-FHAI, and the EFA, the KMO test, and Bartlett's test of sphericity were used to evaluate the suitability of the data set.[29]

Accordingly, KMO values must be above 0.60.[30] In the present study, the KMO value was 0.677, thereby confirming that the study sample was adequate for EFA.

Barlett's test is used for examining the correlation among the variables in a study and p-value related significance, thus suggesting that the correlation is suitable for analysis.[31] The internal consistency of the scale was evaluated with the KR-21 coefficient, it was determined that the internal consistency was at a good level. In the study of Stolt et al., it was found that the KR-21 coefficient was at an acceptable level.[15] Therefore, there is a correlation between the scale items, and they are suitable for EFA.[29]

Before the adaptation of the S-FHAI to Turkish, it was researched whether it is a tool that can be used for assessment of self-foot health of individuals in Turkey. However, Kır Biçer and Enç found that no tool other than the "Foot Care Behaviors Scale" adapted to Turkish. In this tool, the foot health of the individuals is evaluated by the nurses.[32]

Item total score correlation and Cronbach's alpha coefficient were used to evaluate the internal consistency of the tool. The total score of S-FHAI and the correlation coefficient of the scores obtained from each item was between 0.228-0.819 in the nurses, and there was a positive correlation between the item scores and the total score. The Cronbach's alpha value of the tool was 0.929 in the nurses. The results showed that the internal consistency of S-FHAI is very high.

CONCLUSION

In conclusion, a measurement tool consisting of 4 subdimensions and 22 items compatible with the original scale was obtained. Although analyzes revealed that some of the items in the tool had low validity and reliability results, all items were easily understandable and applicable by nurses. In addition, it can be stated that the tool is a reliable and valid tool that healthy/patient individuals can use to independently evaluate their foot health. We recommend re-evaluating the validity and reliability of the scale by enlarging the sample group and/or including different sample groups.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Hanife Durgun;* ***Design:*** *Hanife Durgun, Berna Köktürk Dalcalı, Şeyda Can;* ***Control/Supervision:*** *Hanife Durgun;* ***Data Collection and/or Processing:*** *Hanife Durgun;* ***Analysis and/or Interpretation:*** *Hanife Durgun, Berna Köktürk Dalcalı, Şeyda Can;* ***Literature Review:*** *Hanife Durgun, Berna Köktürk Dalcalı, Şeyda Can;* ***Writing the Article:*** *Hanife Durgun, Berna Köktürk Dalcalı, Şeyda Can;* ***Critical Review:*** *Hanife Durgun, Berna Köktürk Dalcalı, Şeyda Can;* ***References and Fundings:*** *Hanife Durgun.*

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