Validity and Reliability of the Turkish Version of Jefferson Scale of Empathy for Nursing Students

Hemşirelik Öğrencileri İçin Jefferson Empati Ölçeğinin Türkçe Versiyonunun Geçerlik ve Güvenirliği

Aygül YANIK,[a]
Sefa SAYGILI[b]

[a]Department of Child Development,
[b]Department of Health Management,
Kırklareli University School of Health Sciences, Kırklareli

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Yazışma Adresi/*Correspondence:*
Aygül YANIK
Kırklareli University School of Health Sciences,
Department of Child Development,
Kırklareli,
TÜRKİYE/TURKEY
aygul4@hotmail.com

ABSTRACT Objective: To investigate the Turkish validity and reliability of the Jefferson Scale of Empathy for Nursing Students (JSENS). **Material and Methods:** The study sample consisted of 414 nursing students. The construct validity of the scale was tested with confirmatory factor analysis (CFA) whereas the concurrent scale validity was tested with Empathic Tendency Scale (ETS). The reliability of the scale was evaluated with internal consistency and the internal consistency was assessed with Cronbach's alpha and item-total correlation. **Results:** The results of the CFA showed that JSENS fitted the three-factor model. However, the factor loadings of two items were very low, therefore these items were extracted from the scale and CFA was run again. The goodness of fit indices of the three-factor model containing 18 items were acceptable. The subscale scores of the JSENS and total score showed positively correlations with the ETS score. The Cronbach's alpha coefficient was 0.73 for all items. The item-total correlations ranged from 0.11 to 0.46 in the item analysis conducted for 18 items. **Conclusion:** The Turkish adaptation of the JSENS contained three factors and 18 items. The JSENS can be used as a valid and reliable instrument for evaluating empathy in nursing students.

Key Words: Empathy; students, nursing; reproducibility of results

ÖZET Amaç: Hemşirelik Öğrencileri İçin Jefferson Empati Ölçeği (HÖİJEÖ)'nin geçerlik ve güvenirliğini incelemektir. **Gereç ve Yöntemler:** Araştırmanın örneklemini 414 hemşirelik öğrencisi oluşturdu. Ölçeğin yapı geçerliği doğrulayıcı faktör analizi (DFA) ile, eş zamanlı ölçek geçerliği (concurrent validity) ise Empatik Eğilim Ölçeği (EEÖ) kullanılarak test edildi. Ölçek güvenirliği iç tutarlılık ile, iç tutarlılık da cronbach alfa ve madde-bütün korelasyon ile değerlendirildi. **Bulgular:** Yapılan DFA sonucunda HÖİJEÖ 3 faktörlü modele uyum gösterdi. Ancak, iki maddenin faktör yükleri çok düşüktü, bu yüzden bu maddeler ölçekten çıkarıldı ve DFA yeniden yapıldı. 18 maddeden oluşan 3 faktörlü modele ait uyum indeksleri kabul edildi. HÖİJEÖ'nin alt boyut puanları ve toplam ölçek puanı EEÖ puanı ile pozitif yönde anlamlı korelasyon göstermekte idi. Cronbach alpha katsayısı bütün ölçek maddeleri için 0,73'tü. 18 madde için yapılan madde analizinde madde-bütün korelasyonları 0,11 ile 0,46 arasında değişti. **Sonuç:** HÖİJEÖ'nin türkçe uyarlaması 3 faktör ve 18 maddeden oluştu. HÖİJEÖ hemşirelik öğrencilerinde empatinin değerlendirilmesi için geçerli ve güvenilir bir araç olarak kullanılabilir.

Anahtar Kelimeler: Empati; öğrenciler, hemşirelik; sonuçların yeniden üretilebilirliği

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Empathy is a concept deeply rooted in and central to professional nursing, because it enables the nurses to fulfill key medical tasks more accurately and enhances patient health outcomes.[1,2] Recently, evidence supporting the utilization of empathy in clinical nursing has steadily

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accumulated.[3] For example, a study on the effect of nurses' empathy on cancer patients' anxiety, depression, hostility and satisfaction showed that patients who received care from nurses with high levels of empathy had significant reductions in anxiety, depression, and hostility.[4] Despite the importance of empathy, being the backbone of patient-nurse relationship, research on the topic is scarce due to the lack of consensus about the conceptualization and measurement of empathy.[5] The first researcher, who believed empathy to be one of the most important components of the caregiver-patient relationship, was Carl Rogers. He confirmed the meaning of empathy to be a factor enhancing therapeutic efficacy. According to Rogers, empathy can be defined as an accurate understanding of another person's inner experience.[6] Empathy has been defined by many other authors following Rogers. Hojat proposed the following definition of empathy in the context of patient care: "Empathy is a predominantly cognitive (rather than emotional) attribute that involves an understanding (rather than feeling) of experiences, concerns and perspectives of the patient, combined with a capacity to communicate this understanding".[5] Hojat also developed two scales to measure empathy among health care providers in patient care [Jefferson Scale of Empathy (JSE)] and to measure empathy among medical students and physicians [Jefferson Scale of Physician Empathy (JSPE)].[7,8] Later, Ward et al. made a slight modification in JSPE to measure empathy among undergraduate nursing students, and they renamed this scale as The Jefferson Scale of Empathy for Nursing Students (JSENS). The factor structure of these scales is consistent with the conceptual aspects related to the multidimensionality notion in empathy.[9,10]

Because empathy is a necessary skill for providing better patient care, it is crucial for nursing schools to educate students on the importance of empathy as an integral part of professionalism in nursing. In Turkey, empathy among nursing students and nurses is evaluated with Empathic Skill Scale (ESS) and Empathic Tendency Scale (ETS), because there are no valid and reliable tools available in measuring empathy among nursing students and nurses.[11,12] A tool is necessary to measure empathy in these groups.

The aim of this study was to establish linguistic validity and cultural adaptation of the JSENS, and investigate the scale's psychometric properties.

MATERIAL AND METHODS

Design: The methodological model was used.

Sample: The study was conducted in Kirklareli University Health College and Mustafa Kemal University Health College on February 15-20, 2011. Nursing students who agreed to complete the question form participated in the study. Since the sample size should be at least five even ten times larger than the number of items in validity and reliability studies, we aimed to reach 200 participants for this instrument composed of 20 items.[13] We reached 448 participants (80.9%) among 554 students in two schools during the time of the study. Among the questionnaires filled by the students, 34 forms were excluded from the study since they contained missing data. Therefore, the sample consisted of 414 participants (74.2%).

Data Collection Process: In the process of collecting data from the students, information about sociodemographic characteristics were collected first using sociodemographic information form. Then, the empathy of nursing students was assessed through the JSENS and ETS. The data collection process took about 15-20 minutes on average.

Data Collection Tools: Data were gathered using the sociodemographic information form, JSENS, and ETS.

Sociodemographic Information Form: This form contained questions about the students' age, sex, year, type of choosing the nursing profession, satisfaction with studying nursing, etc.

JSENS was adapted from JSPE with slight modification to measure empathy among undergraduate nursing students. JSPE was originally developed to measure empathy among medical students and physicians. JSENS is a brief self-report scale with

20 items, each answered on a 7-point Likert-type format (from 1= strongly disagree to 7= strongly agree). Ten of the items are positively worded and directly scored according to their Likert weights, and the other 10 items are negatively worded, thus reverse scored. The scale's scores can range from a minimum of 20 to a maximum of 140. Higher scores indicate a more empathic orientation. The reliability coefficient alpha for JSENS was 0.77 for the entire scale. The reliability coefficients alpha for the tree factors of perspective talking, compassionate care, and standing in the patient's shoes were 0.78, 0.83, and 0.72, respectively.[14]

ETS was developed by Dokmen for evaluating people's empathic potentials in daily life. ETS is a brief self-report scale containing 20 items, each answered on a 5-point Likert-type format (from 1= completely false to 5= completely true). Twelve of the items are directly scored according to their Likert weights, and the remaining 8 items are reverse scored. The minimum total score is 20, whereas the maximum total score is 100. Higher scores indicate increased empathic tendencies, whereas lower scores indicate decreased empathic tendencies. The reliability coefficient alpha for ETS was found as 0.88 in Dokmen's study.

Ethical Issues: Because there is no ethics committee in our institution, we obtained permission from University Health College Director and University Heath College Director for conducting this study. In addition, we gathered the data according to the Declaration of Helsinki (World Medical Association Declaration of Helsinki Ethical Principles For Medical Research Involving Human Subjects). The students were informed about the study and verbal consent was obtained from the students who accepted to participate in the study.

The ethics committee approval is not necessary, so that ethics committee approval was not obtained.

Procedures for Reliability and Validity: The adaptation of the scale was based on reliability and validity studies. Linguistic validity, construct validity, and concurrent validity procedures were conducted. Internal consistency (Cronbach alpha and item-total correlation) was evaluated for reliability.

Translations and back-translations were conducted for the linguistic validity of the scale. The scale was translated into Turkish by the researcher and by 5 people who were fluent in English. The scale was formed by choosing the most appropriate Turkish statements, and then translated into English by a Turkish native speaker who was fluent in English. The scale, which was translated into English, was sent to Hojat, so that it could be evaluated in means of any problems deriving from language differences and it was approved that the back-translated scale was equivalent to the original scale. The scale, which was equivalent to the original scale, was used in the study for data collection.

Before the factor analysis, which would determine the construct validity of the scale, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was conducted examine the appropriateness of factor analysis, and the Bartlett's test of sphericity was conducted to determine the normality of the distribution. The scale's KMO coefficient was 0.78 and the Bartlett's test of sphericity was significant ($p<0.000$).

RESULTS

Among the 414 participants, the mean age was 20.8 years and 74.2% of the participants were females, 29.7% were freshmen, and 46.6% chose the nursing profession willingly. It has been found that 59.2% of the students were satisfied with studying nursing, 64.7% generally felt competent about understanding patients, 4.3% spared some time for patients who needed nurses' attention at the clinic, and 44% thought they needed some information on empathy (Table 1).

VALIDITY OF THE SCALE

A confirmatory factor analysis (CFA) was conducted in order to test JSENS's three-factor model which resulted from exploratory factor analysis. Although the data set fitted the three-factor model at an acceptable level, it has been determined that items

TABLE 1: Sociodemographic characteristics of students.

Sociodemographic characteristics	n	%	
Age (year)		20.8+1.9 (Range:17-33)	
Sex	Female	307	74.2
	Male	107	25.8
Class	First	123	29.7
	Second	106	25.6
	Third	75	18.1
	Fourth	110	26.6
Choosing the nursing profession	Willingly	193	46.6
	Almost willingly	165	40.1
	Unwillingly	55	13.3
Satisfaction with studying nursing	Satisfied	245	59.2
	Partially satisfied	141	34
	Unsatisfied	28	6.8
Feeling competent about understanding patients	Always	53	12.8
	Frequently	268	64.7
	Sometimes	72	17.4
	Seldom	21	5.2
Sparing enough time for patients who need nurses' attention at the clinic	Yes	170	41.1
	Partially	225	54.3
	No	19	4.6
Thinking they need information on empathy	Yes	126	30.4
	Partially	182	44.0
	No	106	25.6

"Nurses should not allow themselves to be influenced by strong personal bonds between their patients and their family members" [Compassionate Care 7 (CC7)] and "A nurse's sense of humor contributes to a better clinical outcome" [Perspective Taking 3 (PT3)] had low factor loadings and CFA was conducted after removing the above items from the scale. The goodness of fit indices of the three factors model containing 18 items are shown in Table 2. The factor loadings for the 18 items which grouped under 3 factors ranged from 0.33 to 0.66 (Figure 1).

The concurrent validity results showed that all sub-dimension scores and the total score of the JSENS were positively correlated with the total score of the ETS (Table 3).

TABLE 2: The goodness of fit indices for the three factors model.

The goodness of fit indices	
χ^2/df* (259.27/132)	1.96
GFI	0.93
AGFI	0.92
CFI	0.93
SRMR	0.051
RMSEA	0.048

*p =0.00

df: Degrees of freedom, GFI: Goodness of Fit Index, AGFI: Adjusted Goodness of Fit Index, CFI: Comparative Fit Index, SRMR: Standardized Root Mean Square Residual, RMSEA: Mean Square Error of Approximation Residual.

RELIABILITY OF THE SCALE

The reliability of the scale was evaluated with internal consistency and internal consistency was assessed with Cronbach's alpha and item-total correlation. The Cronbach's alpha coefficient for all items and CC, PT and SPS sub-dimensions were 0.73, 0.62, 0.74 and 0.45, respectively. In order to determine the ability of the items in the scale to

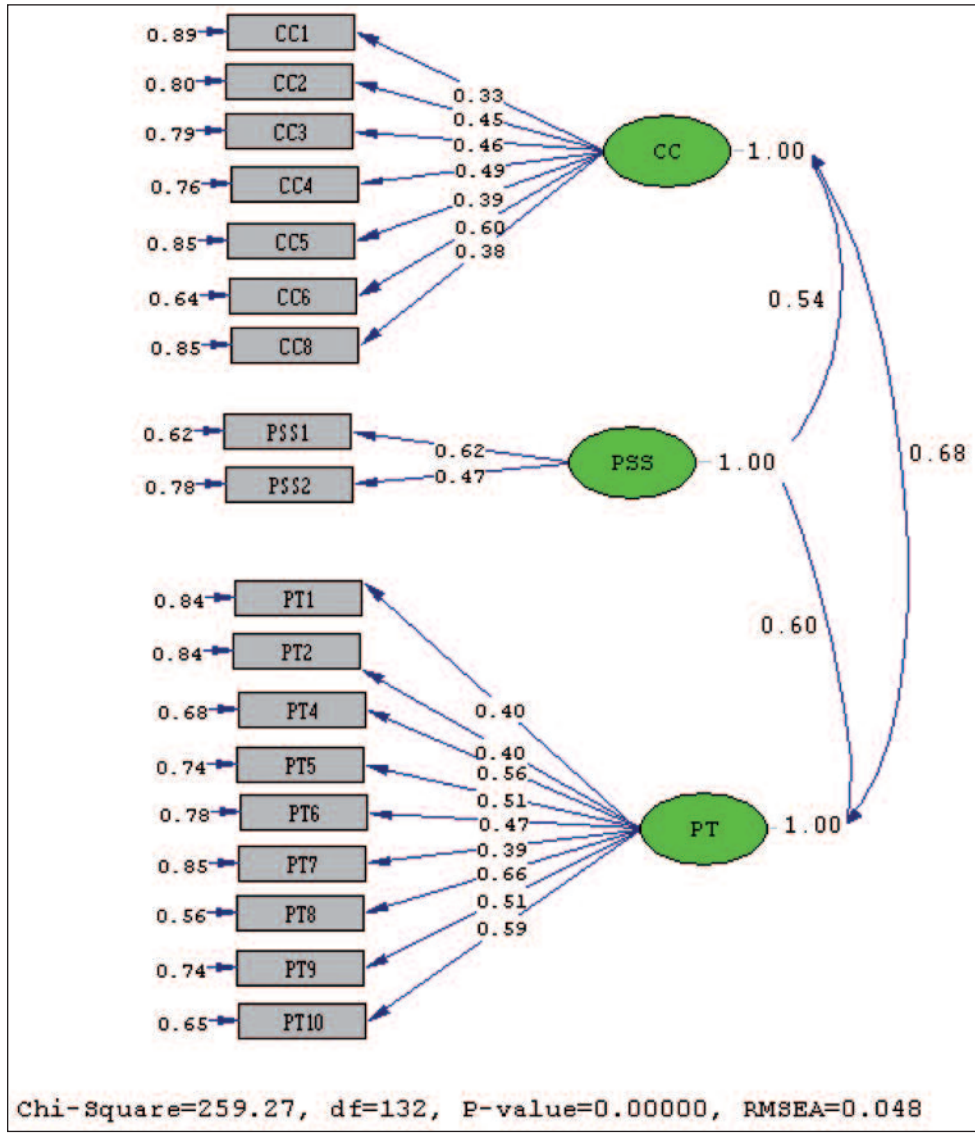

FIGURE 1: Factor-item relationship of JSENS.
CC: Compassionate care; PT: Perspective taking; SPS: Standing in patient's shoes; JSENS: The Jefferson Scale of Empathy for Nursing Students.
(See color figure at http://www.turkiyeklinikleri.com/journal/tip-bilimleri-dergisi/1300-0292/)

TABLE 3: The Correlations of JSENS with the ETS.

	CC	PT	SPS	JSENS
ETS	r=0.147	r=0.293	r=0.107	r=0.281
	p=0.030	p<0.001	p=0.030	p<0.001

CC: Compassionate care; PT: Perspective taking; SPS: Standing in patient's shoes; JSENS: The Jefferson Scale of Empathy for Nursing Students. ETS: Empathic tendency scale.

measure similar behaviors, we calculated the relationship between the item scores and the total score (item-total correlation). Additionally, to determine the competency of each item in terms of being able to discriminate the caregiver burden of individuals, the significance of the difference between the upper 27% and lower 27% groups' item scores was examined. The item-total correlations for all the items in the scale ranged from 0.11 to 0.46, and t values were significant (p<0.001) (Tab-

TABLE 4: Findings of the scale reliability.

Item no	Item-total correlation[1]	Cronbach's alpha if item feleted	Cronbach alpha
CC1	0.29	0.72	0.62
CC2	0.32	0.72	
CC3	0.32	0.72	
CC4	0.37	0.71	
CC5	0.28	0.72	
CC6	0.44	0.71	
CC8	0.25	0.72	
PT1	0.26	0.72	0.74
PT2	0.30	0.72	
PT4	0.35	0.71	
PT5	0.33	0.72	
PT6	0.37	0.71	
PT7	0.28	0.72	
PT8	0.52	0.71	
PT9	0.34	0.72	
PT10	0.46	0.71	
SPS1	0.16	0.73	0.45
SPS2	0.11	0.74	

[1]n=414

CC: Compassionate care; PT: Perspective taking, SPS: Standing in patient's shoes.

le 4).

There was no relationship between age and empathy scores p=0.773, and additionally empathy scores did not differ according to the year of study in school (p=-0.151). Empathy scores were 101.8+11.8 in women and 98.3+12.1 in men. Empathy scores differed significantly according to sex (p=0.008) Empathy scores of students who chose the nursing profession willingly, almost willingly, and unwillingly were 103.2+11.0, 99.2+11.1, and 98.1+15.6, respectively. Empathy scores differed significantly according to the type of choosing the nursing profession (p<0.001). There were differences between participants who chose the nursing profession willingly and almost willingly (p=0.005) and between those who chose the nursing profession willingly and unwillingly (p=0.015).

Empathy scores of participants who always felt competent about understanding patients, who frequently felt competent, who sometimes felt competent, and who seldom felt competent were 106.9+10.3, 101.1+11.8, 97.9+10.8, and 93,7+14.8, respectively. Empathy scores differed significantly according to feeling competent about understanding patients (p<0.001). There were differences between participants who always felt competent about understanding patients and those who frequently felt competent (p=0.005), between those who always felt competent and those who sometimes felt competent (p<0.001), between those who always felt competent and those who seldom felt competent (p<0.001), and between those who frequently felt competent and those who seldom felt competent (p=0.028).

DISCUSSION

JSENS was found to be a valid and reliable instrument to measure empathy among nursing students. Translation of an existing instrument into another language is not a simple translation of words; it requires extensive developmental research to produce a culturally equivalent form of instrument and psychometric testing to establish equivalence.[15] In the present research, cultural and conceptual equivalence were obtained via back translation and similar constructs in the JSENS. KMO measure of sampling adequacy was conducted examine the appropriateness of factor analysis. KMO coefficient should be above 0.60, as this coefficient approaches 1, it is considered as perfect.[16,17] In our study, the KMO coefficient was found to be 0.78. Bartlett's test of sphericity was conducted to determine the normality of the distribution in our study. We concluded that our data set was appropriate for factor analysis since the Bartlett's test of sphericity was significant.[17]

The goodness of fit indices determine whether a model is supported by a data set at an acceptable level. There are various goodness of fit indices and the most commonly used ones are degrees of freedom (χ^2/df), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR) and Mean Square Error of Approximation Residual (RMSEA). A model is assumed to be acceptable if χ^2/df<3, GFI>0.90, AGFI>0.85, CFI >0.90, SRMR<0.10, and RMSEA<0.05.[18,19] Although the observed data fitted the

three-factor model at an acceptable level, it has been determined that factor loadings of the items CC7 and PT3 were below 0.30 at the end of the CFA. It has been recommended that factor loading of an item should be at least 0.30, so that item can be included in a factor.[13-20] Therefore, the CFA was conducted again after the removal of two items. It has been concluded that the observed data fitted the three-factor model at an acceptable level as the goodness of fit indices were acceptable. A similar pattern of factor structure has also been reported in three factor analytic studies of the JSENS, JSPE and JSE. These studies were conducted with students at a nursing school, a dental school and with medical students.[14,21,22] These findings suggest that the underlying components of the JSENS, JSPE and JSE were similar in physicians, medical and dentistry students as well as nursing students.

Concurrent validity is a commonly used method in validity studies. ETS was used for evaluating the concurrent validity of the scale and the correlations between the scores were assessed. Regarding correlation analyses, the effect sizes are small when the correlation coefficient is equal to or larger than 0.10, medium when the correlation coefficient is between 0.30-0.50, and large when the correlation coefficient equals or exceeds 0.50.[23] In our study, all factor scores and the total score of the JSENS showed middle correlations with the ETS. It was concluded that the JSENS was a valid instrument to measure empathy since the correlations between the scales indicated middle effect sizes.

The Cronbach's alpha coefficient is a commonly used method of validity in Likert-type scales. The scale is considered middle reliable when this coefficient ranges from 0.40 to 0.60, very reliable when ranges from 0.60 to 0.80 and highly reliable when ranges from 0.80 to 1.00.[24] Because the JSENS is a Likert-type scale, the Cronbach's alpha coefficient was calculated. It was found to be 0.73 for all items. The internal consistency of the CC, PT and SPS were 0.62, 0.74, 0.45, respectively. The facts that the factor coefficients are above 0.40 showed that the CBS was a reliable instrument to use in the Turkish population.

A study conducted in the United States with nursing students found that the Cronbach's alpha coefficient was 0.77 for JSENS; and 0.83, 0.78 and 0.72 for CC, PT, and SPS, respectively.[14] Similarly, a study conducted with physicians by Hojat et al. found a correlation coefficient of 0.81, whereas a study conducted with Japanese medical students by Kataoka et al. found a correlation coefficient of 0.80. In addition, a study conducted with Mexican medical students by Alcorta-Ganza et al. found a correlation coefficient of 0.74. Although the correlation coefficients in our study were lower than those in other studies, it was possible to compare them with each other. The facts that the factor coefficients are above 0.40 and that they are similar to the original scale show that the JSENS is a reliable instrument to use in the Turkish population.

An item-total correlation is the correlation between an individual item and the sum of the remaining items that constitute the scale. It can be said that items which have an item total correlation of 0.20 or higher can discriminate individuals at a good level.[25] If an item-total correlation is low, this can be seen as evidence that the item is not measuring the same construct by the other scale items. We might therefore choose to discard items exhibiting low item-total correlations. On the other hand, if the removal of items with a low item total correlation results in an increase of the Cronbach's alpha value, the relevant items should be discarded; if not, the items should not be discarded.[26] Because the removal of items SPS1 and SPS2 with low item total correlations in the Turkish adaptation of JSENS did not result in a significant difference in the Cronbach's alpha value, and because these items measured an important construct related to empathy, they were not discarded.

It was determined that female students had higher empathy scores than male students in this study. This finding is consistent with the results of other studies conducted with nursing students in the United States, medical students, physicians and students in a dental school.[8,14,21,27] Empathy scores increased through first year students to third year students, but there was no statistically significant

difference in this regard. Other findings on this topic are inconsistent. In a study conducted with nursing students, it was reported that students who had more clinical experience received higher empathy scores.[14] Similarly, Kataoka et al. reported that first year medical students had low empathy scores whereas senior year students had high empathy scores. Studies conducted with American medicals students and American dentistry students showed that first year students had lower empathy scores compared to other students.[21,28,29]

In this study, it was determined that students who chose the nursing profession willingly had higher empathy scores than those who chose the nursing profession almost willingly and unwillingly. It can be said that empathy is a necessary component in nursing regarding the nature of the profession. Students who chose the nursing profession willingly might have investigated the nursing profession and the roles and responsibilities of nurses before making this choice. This would explain the relevant findings. We also found that empathy scores differed according to feeling competent about understanding patients, and students who reported that they understand the patients better had higher empathy scores. Empathy in patient care situations may be described as an ability to understand the patient's inner experience and perspective, and to communicate this understanding.[6] Considering the description of empathy, our results indicate that the empathy scale used in this study is a valid instrument.

CONCLUSION

The Turkish adaptation of JSENS consisted of three factors and 18 items. The scale can be used as a valid and reliable instrument for evaluating empathy in nursing students.

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