Adaptation of the Public Health Nurse-Precepting Experiential Learning Scale to Turkish Culture

Halk Sağlığı Hemşirelerinin Deneyimsel Öğrenme Eğitimi Ölçeği'nin Türk Kültürüne Uyarlanması

Adem SÜMEN, Derya ADIBELLİ

ABSTRACT

This study was conducted to test the validity and reliability of the Public Health Nurse - Precepting Experiential Learning Scale in Turkish culture and to examine its psychometric properties. This study was conducted as a methodological study. 179 faculty members participated in the study, and the participation rate was 72.5%. Within the scope of the adaptation studies of the Public Health Nurse - Precepting Experiential Learning Scale, language validity and construct validity in samples were first examined. Then, the reliability coefficients of the scale in the Turkish sample was calculated. According to the results of the exploratory factor analysis, it was observed that the Turkish form of Public Health Nurse - Precepting Experiential Learning Scale had three sub-dimensions and explained 50.709% of the total variance. As a result of the confirmatory factor analysis, the goodness of fit values of the scale were calculated as χ^2/sd=1.76, RMSEA=0.066, CFI=0.90, GFI=0.90 and AGFI=0.91. Furthermore, item factor loadings ranged from 0.517 to 0.759. The total Cronbach's alpha internal consistency coefficient of the scale was found to be 0.86, and its sub-dimensions ranged from 0.63 to 0.80. In the study, it was concluded that the Public Health Nurse - Precepting Experiential Learning Scale was a valid and reliable measurement tool that could be used for Turkish society. The scale can be used to evaluate the education provided by Public Health Nursing educators.

Keywords: Experiential learning, Public health nursing, Reliability, Scale, Validity

ÖZ

Bu çalışma Halk Sağlığı Hemşirelerinin Deneyimsel Öğrenme Eğitimi Ölçeği'nin Türk kültüründe geçerlik ve güvenirliğini test etmek ve psikometrik özelliklerini incelemek amacıyla yapılmıştır. Araştırma metodolojik tipte gerçekleştirilmiştir. Araştırmaya 179 öğretim üyesi katılmış olup, katılım oranı %72.5'tir. Halk Sağlığı Hemşirelerinin Deneyimsel Öğrenme Eğitimi Ölçeği'nin psikometrik özelliklerini tespit etmek için öncelikle kapsam dil geçerliği ve yapı geçerliği incelenmiştir. Daha sonra ölçeğin Türkiye örneklemindeki güvenirlik katsayıları hesaplanmıştır. Açıklayıcı faktör analizi sonuçlarına göre Halk Sağlığı Hemşirelerinin Deneyimsel Öğrenme Eğitimi Ölçeği'nin Türkçe formunun üç alt boyuta sahip olduğu ve toplam varyansın %50.709'unu açıkladığı görülmüştür. Doğrulayıcı faktör analizi sonucu ölçeğin uyum iyiliği değerleri χ^2/sd=1.76, RMSEA=0.066, CFI=0.90, GFI=0.90 ve AGFI=0.91 olarak hesaplanmıştır. Ayrıca madde faktör yükleri de 0.517 ile 0.759 arasında sıralanmaktadır. Ölçeğin toplam cronbach alfa iç tutarlık katsayısı 0.86 bulunmuş, alt boyutları ise 0.63 ile

Adem SÜMEN (✉)
ORCID ID: 0000-0002-8876-400X

Akdeniz University, Kumluca Faculty of Health Sciences, Department of Public Health Nursing, Antalya, Turkey
Akdeniz Üniversitesi Kumluca Sağlık Bilimleri Fakültesi, Halk Sağlığı Hemşireliği Anabilim Dalı, Antalya, Türkiye
ademsumen@akdeniz.edu.tr

Derya ADIBELLİ
ORCID ID: 0000-0001-9320-7083

Akdeniz University, Kumluca Faculty of Health Sciences, Department of Public Health Nursing, Antalya, Turkey
Akdeniz Üniversitesi Kumluca Sağlık Bilimleri Fakültesi, Halk Sağlığı Hemşireliği Anabilim Dalı, Antalya, Türkiye

51

0.80 arasında değişmektedir. Araştırmada, Halk Sağlığı Hemşirelerinin Deneyimsel Öğrenme Eğitimi Ölçeği'nin Türk toplumu için kullanılabilecek geçerli ve güvenilir bir ölçme aracı olduğu sonucuna ulaşılmıştır. Ölçek, Halk Sağlığı Hemşireliği eğitimcileri tarafından verilen eğitimi değerlendirmek için kullanılabilir.

Anahtar Sözcükler: Deneyimsel öğrenme, Geçerlik, Güvenirlik, Halk sağlığı hemşireliği, Ölçek

INTRODUCTION

Public health nursing (PHN) is considered by the World Health Organization as "a special field in nursing, which functions to increase the health of the whole society, to make the physical and social environment positive, to protect the society from diseases and disabilities, and includes all nursing skills and some stages of public health and social assistance" (Demirel & Akın, 2014). While the service target of PHN is "healthy population", its service area is usually "each place where this population lives" outside the hospitals, where treatment services are provided, and in the society, and its service form is the approach of "all kinds of modern services offered to this population" (American Public Health Association, 1996). Based on this approach, PHN generally focuses on the physical, biological and socio-cultural environment and provides community-oriented services in the home, school, workplace, prison, clinic where the healthy person is followed, and other social areas, as well as in health institutions, in short, all areas with people (World Health Organization, 2018). PHN's practices consist of protecting and improving the health of the individual, family and society throughout life, preventing disease and disability, and working autonomously or in coordination as the first contact point of care (Evans-Agnew et al., 2017). Therefore, in the PHN course, it is of great importance to provide students with knowledge, skills and attitudes about preventive health services to increase the level of public health that they will use in their professional life (Evans-Agnew et al., 2017; Siemon et al., 2018).

Nursing education, which includes a theoretical and practical education process, has reflected the rational view to the medical care system in parallel with the health and educational sciences until recently, which developed business-centered approach and suppressive models, and nursing education has involved a number of technical functions. However, nowadays, it is a necessity for learners to actively participate in the teaching-learning process, to realize effective learning, to investigate and question in nursing education (Dikmen, 2015). Therefore, the duties and roles of public health nurses should be fully adopted and emphasized by academicians in the universities for nursing students during their undergraduate education (Altay & Öz, 2016). Furthermore, in nursing education, students need to transform the knowledge learned into skills and to transfer the skill to their clinical practice (Houghton et al., 2013). In recent years, the use of active learning methods, which are known to have favorable outcomes on students' cognitive, affective and psychomotor skills, has increased in nursing education (Culha, 2019). Accordingly, many theories about learning styles and many learning style models within

the framework of these theories have been prepared after the 1980s. Among these models, Kolb's Learning Style Model is one of the most frequently used models (McCarthy, 2016). According to Kolb's Experiential Learning Theory, learning is defined as the process in which knowledge emerges through transformation of experience. Knowledge emerges from the combination of comprehending and transforming experience (Kolb & Kolb, 2017; Morris, 2019).

According to Kolb, learning styles are permanent and stable situations formed by the interaction of people and environment. While individuals may prefer different methods of learning, they can also use them together (Kolb & Kolb, 2017). In this context, in the Learning Style Model, Kolb defines four learning cycles, including concrete experience, reflective observation, abstract conceptualization and active experimentation (Fewster-Thuente & Batteson, 2018). Students should go through these four learning stages in the learning process (Morris, 2019). While concrete experience is learning by "feeling", reflective observation is learning by "observing", abstract conceptualization is learning by "thinking", and active experimentation is learning by "doing". In this learning cycle, individuals feel knowledge or perceive/comprehend it by thinking, and process/transform it by observing or doing (Kolb & Kolb, 2017). According to the Experiential Learning Theory, the educator should plan course activities using the learning methods, in which students use the learning methods which include concrete experience, reflective observation, abstract conceptualization and active experimentation, respectively. A great variety of teaching methods should be used for it (Hill, 2017). While students have concrete experiences on the learning topic in the first stage, they acquire different perspectives with an inquiry approach in the second stage, they comprehend the logical structure of the knowledge gained through experiences in the third stage, and they will have comprehended the topic through practices in the final stage (Hill, 2017; Murray, 2018). At the end of this process which is called as a "four-stage process", permanent and individual teaching will be achieved (Kolb & Kolb, 2017; Morris, 2019). Experiential learning helps to improve nursing students' awareness of community nursing, to strengthen professional sense, to encourage active learning, and to develop comprehensive skills of community health nursing (LI & LI, 2017).

Accordingly, PHN is of great importance to evaluate the dimensions of education provided by educators based on experiences and application areas. With the PHN course taken in undergraduate education, nursing students are expected to increase their competencies. In our country, no measurement tool was found to evaluate the realization of this expectation

and the experiential learning dimension. Based on this point of view, the aim of the study was to adapt the "Public Health Nurse - Precepting Experiential Learning Scale", which was developed for nursing educators and is based on Kolb's Experiential Learning Theory, to Turkish culture and to test its validity and reliability.

METHODS

Design

This study was conducted as a methodological study. The language validity, the adaptation and the translation process procedure of the questionnaires suggested by the World Health Organization were followed in the adaptation studies (World Health Organization, 2021).

Participants and Sampling

Faculty members working in the department of public health nursing of the nursing departments of universities' nursing faculties, faculties of health sciences and vocational health high schools in Turkey constituted the population of the study. According to the statistics of Council of Higher Education, there are a total of 247 faculty members including 26 professors, 30 associate professors, 97 assistant professors, 27 lecturers and 67 research assistants in the department of public health nursing. The sample is recommended to be at least 5 times the number of items in the scale to perform factor analysis in validity and reliability studies (Yong & Pearce, 2013). Therefore, sample selection was not performed and it was attempted to reach the whole population. 179 faculty members participated in the study, which was approximately nine times the number of items, and the participation rate was 72.5%.

Measures

The data were collected using the personal information form, which was prepared by the researchers by reviewing the literature (Shimazu, 2018; 2020), and the Public Health Nurse - Precepting Experiential Learning Scale.

Personal Information Form

It included introductory information of the faculty members who participated in the study, and it consisted of five questions.

Public Health Nurse - Precepting Experiential Learning Scale (PHN-PELS)

The scale was developed by Shimazu (2018) to evaluate the learning of public health nursing students through the experiences of public health nursing faculty members. The scale consists of four factors: (a) role performance in the improvement of students receiving public health nursing education, (b) self-development as a public health nurse, (c) sharing to improve students receiving public health nursing education, and (d) improving the career development environment. The items are of 5-point Likert-type ranging from "strongly agree" to "strongly disagree" and consist of 20 items. Higher scores indicate more experiential learning. Shimazu

(2018) the total Cronbach's alpha value of the PHN-PELS as 0.88 and its sub-dimensions as (a) 0.76, (b) 0.80, (c) 0.71 and (d) 0.78.

Data Collection

The data collection forms were collected online by the researchers by transferring them to electronic media using Microsoft Forms application between September and October 2020. The e-mail addresses of faculty members were obtained from the web addresses of the nursing faculties (14), faculties of health sciences (122), health sciences schools (6) and vocational health high schools (14) included in the statistics of Council of Higher Education, and the form was sent to everyone. The faculty members were informed that they were free to participate in the study or not that they study was conducted on a voluntary basis. The requirement for voluntary consent was indicated at the beginning of the questionnaire, and the faculty members who accepted to participate in the questionnaire started to answer the questions after confirming their acceptance electronically. It took an average of 10-15 minutes to answer the forms. The data were collected in a period of approximately four weeks.

Data Analysis

SPSS 25.0 and AMOS 21.0 ready-made package programs were used in the analysis of the data. Content language validity, construct validity, criterion-related validity, discrimination, internal consistency reliability, split-half test reliability and item analysis methods were used to determine the psychometric properties of the PHN-PELS. The Davis technique was used to calculate the language content validity index of the scale. After confirming the suitability of the data for factor analysis, Exploratory factor analysis (EFA) was performed using the Principal Components Analysis and Varimax Rotation methods to examine the factor structure of the scale. Confirmatory factor analysis (CFA) were performed on the data obtained for the construct validity of PHN-PELS. Bartlett Sphericity Test and Kaiser-Meyer Olkin (KMO) Test results were examined to evaluate the suitability of the data for factor analysis and the adequacy of the sample in order to perform the EFA. CFI (Comparative Fit Index), GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit Index) and RMSEA (Root Mean Square Error of Approximation) and values were used while evaluating the CFA indexes. The Cronbach's alpha value was used for the internal consistency reliability test. Corrected item total correlation coefficients and bottom-top 27% values were examined in item analyses. In the analyses, the confidence interval was 95% and the significance level was set at p<0.05.

Ethical Considerations

For the adaptation of the PHN-PELS to Turkish, permission via e-mail from Shimazu, owner of the scale, approval from the Faculty of Medicine Clinical Research Ethics Committee of the state university in the region (Date: 09 September 2020, Document ID: KAEK-696), and the consents of faculty members via the Informed Consent Form were obtained.

RESULTS

Socio-demographic Characteristics

While 89.9% of the participants were female, 68.2% of them had doctorate education, 64.2% of them worked in the faculty of health sciences, and the majority (36.9%) of them were assistant professors.

Language Content Validity

First, permission was obtained by contacting Taeko Shimazu, the author who developed the scale. The scale items were translated into Turkish by the researchers and three English linguists, who have a command of both languages, culture and terminology and whose native language is Turkish, in order to avoid Turkish problems. The most appropriate statements from the Turkish translations of the questionnaire items were selected by the researchers, and the Turkish questionnaire form was created. The original and Turkish forms of the scale were presented to seven experts for their opinions. In accordance with the expert opinions, the statement "inexperienced/ novice public health nurses" (by novice PHN) in the scale items was changed to "public health nursing student" by obtaining the permission of the author of the original scale, and the PHN-PELS was finalized in accordance with the recommendations. The scale was translated back to English by a linguist, who knew both languages and cultures well, had not seen the English version of the questionnaire before, and whose native language was Turkish, and it was sent back to Shimazu, who developed the questionnaire, for approval. After seven expert opinions evaluating the scale items according to the Davis Technique, the content validity rate was found to be "0.86" for three items and "1.00" for the other 17 items.

Item Analysis

Independent group t-test results showing the discrimination power of all items, and item-total correlation are presented in Table 1. The items with item correlations below 0.30 were not included in the analysis. The item-total correlation values of the scale items varied between 0.389 and 0.569. As it can be seen in the item-total correlation table, 15 items were found to be associated with each other. The raw scores obtained from the scale were put in order from the highest to the lowest to determine the distinctiveness of the items in the scale, and the mean scores of the groups in the bottom 27% and the top 27% were compared by the independent group t-test. As a result of the comparison, it was observed that there was a statistically significant difference between the means of bottom and top group item scores ($p < 0.01$).

Construct validity

First, KMO and Bartlett's Test of Sphericity tests were applied to determine the adequacy of the sample size and the suitability of the data for factor analysis. As a result of the analysis, it was determined that the KMO value was 0.883 and Bartlett's test result was statistically significant by $\chi 2(78) = 780.597$ ($p < 0.05$) (Table 2).

Exploratory Factor Analysis

When the items of PHN-PELS were examined according to the factor rotation results, it was observed that five of them were overlapping. These items were removed from the scale and the EFA was repeated. As a result of the analysis, it was observed that there were three components with eigenvalues above 1 for 15 items as a basis for the analysis. The contribution of these components to the total variance was 50.709%. It

Table 1: Item Analysis Results of the Sub-dimensions of the PHN-PELS (n=179)

Factor t	Item Number	Item Total Score Correlation	t (Bottom 27% **-Top 27% **)	p (Bottom 27% **-Top 27% **)
1 (-9.028)	PELS 1	0.389	-3.723	0.000***
	PELS 3	0.542	-5.196	0.000***
	PELS 4	0.569	-4.863	0.000 ***
	PELS 5	0.491	-6.063	0.000***
	PELS 7	0.575	-5.422	0.000***
	PELS 8	0.546	-4.579	0.000***
	PELS 12	0.530	-5.967	0.000***
	PELS 13	0.515	-4.756	0.000***
2 (-9.468)	PELS 14	0.462	-5.535	0.000***
	PELS 18	0.439	-6.450	0.000***
	PELS 19	0.511	-7.119	0.000***
	PELS 20	0.569	-6.864	0.000***
3 (-20.694)	PELS 10	0.569	-11.197	0.000***
	PELS 11	0.430	-11.723	0.000***
	PELS 16	0.407	-11.272	0.000***

n=179, **$n_1=n_2=48$,** *** p<0.01.*

was determined that the factor loadings of the items varied between 0.517 and 0.759 (Table 2). When the graph with the number of factors on the horizontal axis and the eigenvalues on the vertical axis was examined, it was observed that the high accelerated drop decreased after the fourth point. It was decided that there should be three factors in line with EFA, eigenvalue, variance percentages and the data obtained from the graph (Figure 1).

Confirmatory Factor Analysis

According to the Confirmatory Factor analysis, it was determined that the Structural Equation Modeling Results of

the scale were significant at the p=0.000 level, and that the 15 items and three sub-dimensions constituting the scale were related to the scale structure. When the goodness of fit indexes of the PHN-PELS were examined, the values RMSEA 0.066; GFI 0.90; AGFI 0.91; CFI 0.90; χ2 1.767 (p=0.000) were obtained (Table 3). The path diagram obtained after the confirmatory factor analysis is presented in Figure 2.

Reliability Analysis

In the study, the Cronbach's Alpha value of the PHN-PELS was found to be 0.802 for factor 1, 0.737 for factor 2, 0.634 for factor 3, and 0.861 for the whole scale (15 items). The Average

Table 2: Exploratory Factor Analysis and Reliability Results of the PHN-PELS (n=179)

Factors and items	Variance explained (%)	Eigenvalue	Factor loading	AVE	CR
F1: (α=0.802)					
PELS 1. I encourage nurses to think critically in the field of public health when they face problems	34.399	5.16	0.530	0.54	0.85
PELS 3. I explain the purpose of public health nursing practices			0.558		
PELS 4. I explain the evidence obtained from the client's opinions and statistical data			0.602		
PELS 5. I explain the value of public health nursing practices by showing examples of the clients			0.517		
PELS 7. I associate the meaning of the practices of the students receiving public health nursing with the essence of public health nursing			0.585		
PELS 8. I think about the purpose of public health nurse's practices			0.698		
PELS 12. I am aware of the importance of considering the values of the clients and thinking together			0.639		
PELS 13. I often ask employees to support the improvement of students receiving public health nursing education			0.607		
F2: (α=0.737)					
PELS 14. I ask public health nurses working in different positions to give advice to students receiving public health nursing education	43.501	1.36	0.750	0.48	0.79
PELS 18. I encourage to provide the students receiving public health nursing education with education by the members of the institution			0.641		
PELS 19. I discuss the empowerment of students receiving public health nursing education with the members of the institution that will ensure the continuous career development system			0.618		
PELS 20. I discuss with the members of the institution on teamwork for the improvement of health services			0.759		
F3: (α=0.634)					
PELS 10. I am aware of the importance of taking action to strengthen the client community	50.709	1.08	0.560	0.48	0.73
PELS 11. I am aware of the importance of finding clients who need support even during the application procedure			0.740		
PELS 16. I listen to the administrator's thoughts on public health nursing			0.758		
Total (α=0.861)					
KMO =0.883; χ2(78) =780.597; Bartlett's Test of Sphericity (p) = 0.000					

Table 3: Confirmatory Factor Goodness of fit Index Results of the PHN-PELS (n=179)

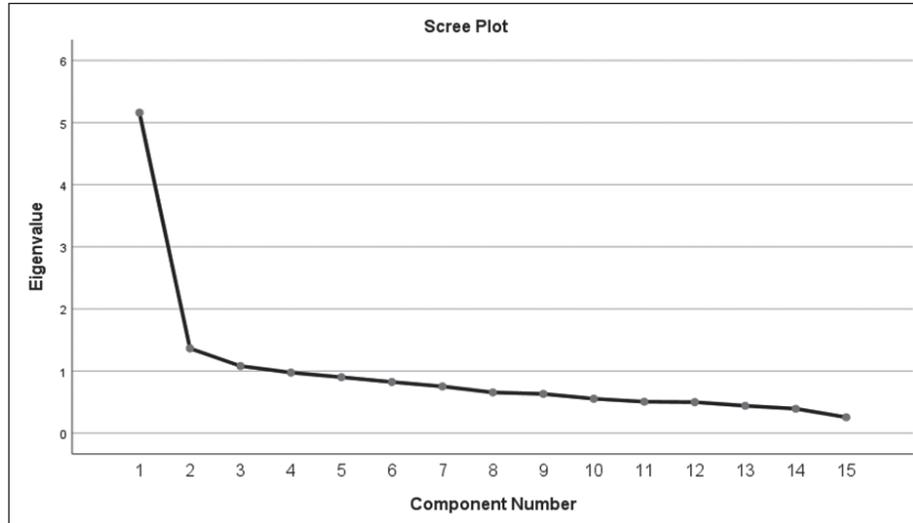| Fit Index	x^2 (p)	df	CMIN/DF	CFI	GFI	AGFI	RMSEA
Criteria	(>0.05)		≤5.0	≥0.90	≥0.90	≥0.90	0.05-0.08
Model	153.767 (<0.001)	87	1.76	0.90	0.90	0.91	0.066

Figure 1: Factor analysis graph on the eigenvalues and factor number of the PHN-PELS (n=179).
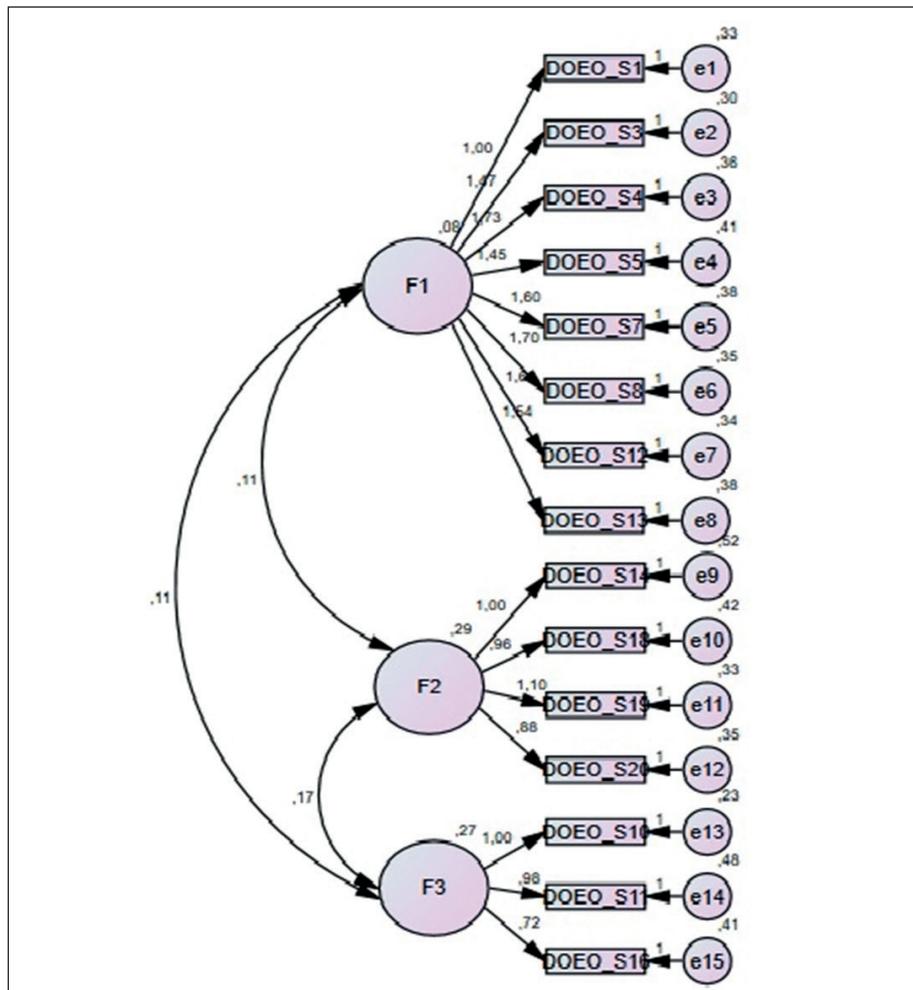

Figure 2: Path diagram of the PHN-PELS (n=179).

Explained Variance (AVE) value and the Combined Reliability (CR) value, which show the construct reliability of the scale, were calculated. According to the values of the PHN-PELS, they were determined as AVE= 0.54 and CR= 0.85 for the first factor, AVE= 0.48 and CR= 0.79 for the second factor, and AVE= 0.48 and CR= 0.73 for the third factor (Table 2).

DISCUSSION

In this study, it is aimed to adapt the PHN-PELS to Turkish, to examine its validity and reliability analysis, and to introduce a measurement tool that can be used in our country to the literature. The results of the study showed that the scale had acceptable parameters in terms of language, construct, content validity and reliability analysis, and it was observed that the scale was a valid and reliable measurement tool for Turkish society.

Content validity is performed to evaluate to what extent the items on the scale measure the concept intended to be measured (Yeşilyurt & Çapraz, 2018). In this study, the opinions of seven experts were obtained to evaluate it and the KGI was calculated accordingly. The KGI values calculated based on the opinions were found between 0.86-1.00. In the Davis technique, KGI value of 0.80 is considered as a criterion (Davis, 1992). According to this evaluation result, it can be said that the content validity of the scale was high.

Factor analysis is performed to test the construct validity in scale validity and reliability studies, and the KMO value and Bartlett's test are used for sampling adequacy before EFA. If a KMO measurement of 0.80 or greater is obtained, this result indicates that the data sampling of the factor analysis is sufficient, and the significance of the Bartlett's test indicates that the items in the scale are suitable for factor analysis (Dixon, 2015). In this study, the fact that the KMO value of the PHN-PELS (0.883) was sufficient and Bartlett's sphericity test result was found to be significant indicated that factor analysis could be performed.

Since five items were overlapping as a result of the EFA of the PHN-PELS performed with the data collected from the lecturers, they were removed from the scale. The fact that an item is overlapping indicates two situations. The first of these is that the acceptance level of that item in more than one factor is high, the second is that the difference between the loading values of that item in two or more factors is less than 0.1 (Çokluk et al., 2012). In this study, the items were removed from the scale since they had high factor loading values in more than one factor at the same time and the difference was less than 0.10. Thus, the PHN-PELS consisted of a total of 15 items and the factor structure decreased from four to three. As a result of the EFA of the scale, the factor loading values of the items are required to be greater than 0.30 (Stevens, 2002) or 0.32 (Tabachnick & Fidell, 2014) as a criteria. In this study, it was observed that the item-total score correlation value was at least 0.517. The factor loadings of all items of the PHN-PELS were found to be sufficient. Furthermore, the fact that the bottom-top 27% item discrimination index values (t) of each item are significant at the p<0.01 significance level indicates

that the discrimination power of the items is high (Schreiber et al., 2006). In this study, CFA goodness of fit values applied as another step of construct validity were examined. Among goodness of fit values, χ2, RMSEA, GFI, AGFI, CFI values were acceptable according to the criteria indicated in the literature (Barrett, 2007; Harrington, 2009; Kline, 2011; Schermelleh-Engel et al., 2003).

The reliability of the measurement model was tested by examining the Cronbach α, AVE and CR values of each factor separately. While the scale is considered have a low reliability if the Cronbach's alpha value is 0.40≤α<0.60, it is considered to be quite reliable if the Cronbach's alpha value is 0.60≤α<0.80, and it is considered to be highly reliable if the Cronbach's alpha value is 0.80≤α<1.00 (Polit and Beck, 2014). In this study, the fact that the Cronbach's alpha value of the scale was 0.86 indicated that it was highly reliable, and one of its sub-dimensions had a low reliability, one was quite reliable, and one was highly reliable. These reliability values are close to the total (0.88) and sub-dimension (0.71-0.74) Cronbach Alpha values of the original scale (Shimazu, 2018). In the measurement model, the CR value should be higher than 0.70 and the AVE value should be higher than 0.50 (Hair et al., 2014). AVE less than 0.5 is acceptable when other reliability measurements are adequate (Tabachnick & Fidell, 2014). In this study, it was observed that CR values were higher than 0.70, and that AVE values were quite close to acceptable limits for the second and third factors. Furthermore, the fact that CR values were higher than AVE values was a result supporting the affinity validity (Hair et al., 2014).

According to the factor analysis performed in the original study of the scale, it was determined that it consisted of a total of four sub-dimensions (Shimazu, 2018). In this study, three factors with an eigenvalue greater than one were obtained according to the result of the EFA by removing the five overlapping items from the scale. However, it was observed that the majority of the items were not included under the same sub-dimensions as in the original scale and were replaced, and there was a change in the number of items in the sub-dimensions. Therefore, it was needed to rename the subscales. While Factor 1 was renamed as "role performance", Factor 2 was renamed as "self-development" and Factor 3 was renamed as "development of PHN".

Limitations of the Study

The study was limited to the faculty members in the department of public health nursing established in universities in Turkey, and the results of the study can be generalized to this group. Other limitations of this study were that it was not known whether the e-mail addresses given by faculty members on their web pages were up-to-date, and the schools did not add new faculty members to their web pages.

CONCLUSIONS

In this study in which the psychometric properties of the PHN-PELS were evaluated, the necessary steps were taken by following the internationally recommended standards

in the scale adaptation studies for the language, scope and construct validity and reliability analysis of the scale, and it was concluded that it had acceptable parameters. The scale can be used to evaluate the dimensions of the education provided by Public Health Nursing educators based on their experience and application areas.

ETHICAL APPROVAL

Ethics committee approval was received for this study from the Akdeniz University Medical Faculty Clinical Research Ethics Committee (Date: 09 September 2020, Document ID: KAEK-696).

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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