Validity and Reliability Study for the Usability Scale of the Electronic Records System in Terms of Nursing Functions

Elektronik Kayıt Sisteminin Hemşirelik İşlevleri Açısından Kullanılabilirlik Ölçeği Geçerlik ve Güvenirlik Çalışması

Fatma AY,[a]
Şehrinaz POLAT[b]

[a]Division of Midwifery,
İstanbul University
Faculty of Health Science,
[b]İstanbul University
İstanbul Faculty of Medicine,
İstanbul

Geliş Tarihi/*Received:* 19.06.2014
Kabul Tarihi/*Accepted:* 10.07.2015

Yazışma Adresi/*Correspondence:*
Fatma AY
İstanbul University
Faculty of Health Science,
Division of Midwifery, İstanbul,
TÜRKİYE/TURKEY
fatmaay@yahoo.com

ABSTRACT Objective: To evaluate the validity and reliability of the Usability Scale of the Electronic Records System in terms of Nursing Functions (USERSNurse). **Material and Methods:** The study comprised 1100 nurses from Istanbul Medical Faculty. A sample of 601 were included in the final analysis. A 50-point scale was created based on a literature review and information taken clinical nurses. After being assessed by 3 experts, the 50-item scale was revised to 38 items, and this version was used in the study. At the end of the study, a 29-item scale was identified: Contribution to Nursing Practice (11 items), Contribution to Knowledge Management (9 items), and Efficacy and Productivity Contribution (9 items). To assess percentages, average split-half, test-retest method, Cronbach's alpha reliability test, item-total correlations, top and bottom 27% of the groups, material mean score difference between t-tests, Pearson's product moment correlation coefficient, and confirmatory factor analysis were used. **Results:** Cronbach's alpha coefficient of the entire scale was 0.98. For subgroups; Cronbach coefficients ranged from 0.79-0.94. Test-retest reliability was 0.73 ($p<0.01$). Two half-test reliability of the scale was 0.94 ($p<0.01$). Item-total correlations were between 0.60-0.83. The difference between the top and bottom 27% points were significant. The construct validity of the factors combined accounted for 70.12% of the variance. Test-retest correlations were significant ($p<0.001$). **Conclusion:** USERSNurse was found to be a reliable tool. Subsequent studies of USERSNurse evaluation groups with different socio-demographic characteristics for the implementation and investigation of validity and reliability are proposed.

Key Words: Electronic health records; nursing records; nurses

ÖZET Amaç: Bu araştırmada; elektronik kayıt sistemine ilişkin hemşirelerin tutumlarını ölçmede "Elektronik Kayıt Sisteminin Hemşirelik İşlevleri Açısından Kullanılabilirlik Ölçeği" (EKSHİAKÖ)'nin geçerlik ve güvenirliğini incelemek amaçlanmıştır. **Gereç ve Yöntemler:** Araştırma, İstanbul Üniversitesi Tıp Fakültesi'nin farklı birimlerinde çalışan 1100 hemşire arasında yapıldı. Örneklemini sözel onay alınan 601 hemşire oluşturdu. Literatür incelemesi ve klinik hemşirelerinden alınan bilgilere dayanarak 50 madde ölçek oluşturuldu. 50 maddeli ölçek, 3 uzman tarafından değerlendirildikten sonra madde sayısı 38'e indirildi. Çalışmada, kişisel bilgi formu ve 38 maddeli taslak ölçek kullanıldı. Çalışmanın sonunda Hemşirelik Uygulamalarına Katkısı (11 madde), Bilgi Yönetimine Katkısı (9 madde), Etkinlik ve Verimliliğine Katkısı (9 madde) boyutları olan ölçek haline geldi. Değerlendirmede yüzdelikler, ortalama, yarıya-bölme, test-tekrar test yöntemi, Cronbach alfa güvenilirlik testi, madde-toplam puan korelasyonu, alt-üst %27'lik grupların madde ortalama puanları arasındaki fark için t testi, Pearson momentler çarpımı korelasyonu, doğrulayıcı faktör analizi kullanılmıştır. **Bulgular:** Ölçeğin tümüne ait Cronbach Alfa katsayısı 0,98'dir. Bu çalışmada elde edilen alt grupların; Cronbach katsayıları 0,79-0,94 arasında değişmektedir. Test-tekrar test güvenilirliği ise 0,73 ($p<0,01$) bulunmuştur. Ölçeğin iki yarı test güvenirliği 0,94 ($p<0,01$) idi. Madde-toplam puan korelasyonları 0,60-0,83 arasındadır. %27 alt-üst grup puanları arasındaki farklılık önemli bulundu. Yapı geçerliliğindeyse, faktörlerin tümü varyansın %70,12'sini açıklamaktadır. Test-tekrar test korelasyonları anlamlıdır ($p<0,001$). **Sonuç:** EKSHİAKÖ hemşirelik işlevleri açısından güvenilir bir araçtır. Sonraki çalışmalarda, EKSHİAKÖ'nin farklı sosyo-demografik özellikli gruplarda geçerlik-güvenirliğinin incelenmesi önerilmektedir.

Anahtar Kelimeler: Elektronik sağlık kayıtları; hemşire kayıtları; hemşireler

doi: 10.5336/nurses.2014-41150

Turkiye Klinikleri J Nurs Sci 2016;8(2):93-101

Medical records and the transfer of these records into a digital medium is of paramount importance for increasing the quality and efficacy levels in health practice. It has been stressed that electronic medical records will increase the quality of health care, decrease costs, improve patients' security and satisfaction, institutional efficacy, provide better management of resources, enable data to be used more consciously in decision making, and increase the scientific quality of nursing and medicine in the future.[1-6] Nurses constitute a major health group responsible for providing direct care to patients, determining patients' needs, and deciding where, when, and which medical supplies will be used.[5,7] Various qualitative and quantitative data are entered into the record system by nurses.[5,8,9] However, if nursing records are not written in a systematic fashion and include clinical information that contains repetitive laboratory results, and if the link between nursing records and those of other health care professionals is not consistent, nursing records cannot be shared efficiently.[9,10]

In an electronic records system (ERS), it should be possible to reach all patient information that has been uploaded to the system from every location within the institution. The system should enable the recording of all patient information regarding health care and treatment processes. Access to and use of data should be practical. It should be possible to provide computer aid in diagnostic processes.[11]

The abundance of studies that examine the use of electronic patient records in the health sector throughout the world indicate that the topic is also important outside of Turkey.[1-4,6-8,11-16] In recent years, electronic information systems and electronic medical records have been used extensively in the field of health care in Turkey.[5] The automation system used in hospitals in Turkey is a non-standard and disconnected system, which is used in medical procedures only, and does not allow the transformation of data. Although nursing practices comprise an important part of health care, they are not fully integrated into hospital information and electronic record systems.[12] However, internationally valid measuring instruments that would determine the efficacy of electronic medical records and nurses' opinions about the electronic medical records have not yet been developed.[5,13]

The adapted clinical documentation system allows us to record patient care information using computers.[14] However, it should be noted that computers cannot conduct procedures on their own and they operate with programs by commands developed by humans.

In general, when compared to private companies, public institutions have a hard time using advanced technology. Among public institutions, reasons for not being able to benefit from information technologies include the lack of technical staff members who are informatics experts, the lack of resources or funds that can cover the cost of technology, the understanding of people who are to use technological systems, and the will of administrators.[15] According to our observations and our experience, if nurses found that the electronic patient record system was not appropriate for nursing functions, they did would not want to use the system. Nurses' positive perceptions about the electronic records system can be used both to provide *positive attitudes towards the electronic records system and to improve the quality of care.* Institutions must accept it is important how workers adopt technology and information management. Nurses will be reluctant to use a system they believe is inappropriate. To investigate this, there is need for a scale. Promoting active use of electronic registry systems in public hospitals in particular, and providing that the entire personnel are willing to use the system and believe in its usability can help the system to succeed. Therefore, our study was conducted at a public hospital rather than a private hospital.

The aim and importance of the study: This study was conducted to develop the Usability Scale of the Electronic Records System in terms of Nursing Functions (USERSNurse) for measuring nurses' attitudes toward an electronic record system that increases time efficiency and efficacy and effort management while carrying out nursing functions, and to investigate the validity and reliability of the

scale. USERSNurse could examine whether nurses find the electronic record system usable. If nurses do not think that the electronic record system, which is used for nursing functions or is planned to be used, is usable, they may be unwilling to enter data, record implemented interventions on time, or take an active role in developing the system. In order that nurses used the record system in an effective way, it was important to be aware of opinions on usability problems and attitudes toward the system. In addition, learning about nurses' attitudes toward the electronic record system may help updating the system and enhancing parts that were subject to nurses' negative attitudes. Nurses may adopt applications if they have positive attitudes toward them and use them more frequently in practice.

MATERIAL AND METHODS

This study was conducted methodologically during November and December of 2011 in order to test the validity and reliability of USERSNurse.

The Study Sample: The study sample consisted of 1100 nurses who work in various departments of Istanbul University, Istanbul Faculty of Medicine. We excluded 489 nurses who could not be contacted because of leave and similar reasons, as well as those who refused to participate in the study. A total of 611 answered the questionnaires; however, 9 of these questionnaires included incomplete answers and were therefore excluded from the study. A total of 601 nurses' completed questionnaires were used in the final analysis.

Data Collection: Data was collected via the personal information form, which was developed by the researchers, and the 38-item USERSNurse, which was developed in accordance with a literature review, the opinions of experts, and the opinions of nurses who used electronic records at the hospital. A 50-item scale of USERSNurse was created based on a literature review and information provided by clinical nurses. Twelve items were removed from the 50-item scale after the consideration of three experts and thus became a draft 38-point scale. After a factor analysis of the data, the scale was further reduced to 29 points and this version was used in the study. The scale had 5 Likert-type response categories (1: I do not agree-5: I agree) and 29 items. The scale included 3 sub-dimensions. These sub-dimensions and the number of items they contain were as follows: 1. Contribution to nursing practices (11 items); 2. Contribution to information management (9 items); and 3. Contribution to efficacy and productivity (9 items). Cronbach's alpha reliability coefficient ranges between .93-.98.

Data Analysis: Analyses were conducted using SPSS 21.0 software. For all data, mean, standard deviation, and percentages were used in descriptive statistics. A p value <0.05 was accepted as statistically significant. Confirmatory factor analysis was used for construct validity. In terms of reliability, consistency within time (test-retest method) was measured using Pearson's moment product correlation, split-half test reliability was examined, as were Cronbach alpha coefficients, and item-total correlations were also analyzed. In addition, in the item analyses, the difference between the mean item scores of the lower and upper 27% groups, which were determined according to the total test scores, was calculated using independent samples t-test.

Ethical Considerations: After obtaining permission from Istanbul University Faculty of Medicine Ethics Board for conducting our study (April, 2011), we received legal permission from the Istanbul University Faculty of Medicine Directorate of Nursing Services and Deanship of the Faculty of Medicine (May, 2011).

RESULTS

Among the nurses who participated in the study, 94.18% were female, 50.25% were aged between 20-30 years, 26.76% were aged between 31-40 years, and 22.96% were aged over 41 years. Some 46.09% of the nurses were married, 7.32% graduated from high school, 33.11% had an associate degree, 51.91% had a Bachelor's degree, and 7.65% received university education. Of the nurses, 45.92% had worked at the hospital for 1-5 years, 9.65% for 6-10 years, 14.14% for 11-15 years, 9.32% for 16-20 years, 12.48% for 21-25 years, and 7.49% had worked for 26 years or more.

The mean and standard deviation of the *Contribution to nursing practice* subdimension was 3.57± 1.07, *Contribution to information management* was 3.93±1.09, and *Contribution to efficacy and productivity* was 3.37±1.14; whereas the mean and standard deviation of USERSNurse total scores was 3.67±1.10.

Reliability: For reliability, consistency within time (test-retest method) was measured using Pearson's moment product correlation technique, split-half test reliability was examined using the Spearman-Brown Formula, Cronbach alpha coefficients were examined, and item-total correlation analyses were carried out.

Item total correlations ranged between 0.60 and 0.83 (Table 1). Also, in item analysis, the difference between the mean item scores of the lower and upper 27% groups, which were determined according to total test scores, was calculated using the independent samples t-test. The lower 27% group number (n_1) and upper 27% group number (n_2) included equal numbers of individuals ($n_1=n_2=162$). The difference between the lower-upper 27% group scores was calculated using the independent samples t-test and the t values were found to be significant (Table 1). As a result, it was determined that the scale items were highly reliable and measured the same behavior. This finding indicates that

TABLE 1: Factor Loadings, Item-Total Correlations (r), Means and Standard Deviations of the Usability Scale of the Electronic Record System in terms of Nursing Functions (USERSNurse).

	After rotating the load values			Item-total			t (up27%
Items	Factor 1	Factor 2	Factor 3	correlations (r)[a]	Mean	Sd	low 27%)[b]
The ERS makes it easier to diagnose patients for nurses.	.77			.81	3.43	1.36	-29.74*
The ERS makes it possible to measure the quality of care.	.75			.78	3.47	1.34	-25.10*
The ERS improves the documentation of data.	.73			.61	3.74	1.29	-24.77*
The ERS provides patient specific care.	.71			.75	3.43	1.38	-24.12*
The ERS accelerates discharge plans and discharge training.	.71			.81	3.49	1.32	-25.56*
The Nursing Care Plans in the ERS improves the quality of nursing care.	.70			.78	3.42	1.39	-25.41*
The ERS facilitates access to information.	.69			.77	3.92	1.28	-21.05*
The ERS makes establishing standards for nursing applications easier.	.68			.76	3.62	1.29	-21.18*
The ERS constitutes a solid database for nursing research.	.64			.70	3.81	1.22	-17.42*
The ERS improves the quality of nursing records.	.55			.79	3.63	1.28	-22.52*
The ERS decreases the work load of nurses.	.49			.61	3.24	1.45	-15.66*
The ERS provides data security.		.81		.80	4.02	1.21	-22.69*
The ERS provides instant access to information.		.79		.77	4.05	1.23	-19.59*
The ERS provides a legal support.		.73		.60	4.05	1.26	-13.32*
The ERS increases the quality of data.		.70		.83	3.93	1.22	-24.17*
The ERS facilitates making evidence- based decisions.		.69		.80	3.82	1.30	-21.55*
The ERS facilitates conducting research.		.69		.75	3.93	1.23	-19.69*
The ERS facilitates the supervision of nursing practice.		.62		.75	3.73	1.37	-22.34*
The ERS facilitates patient follow-up.		.57		.78	3.74	1.34	-22.67*
The ERS decreases record errors.		.56		.75	3.61	1.34	-21.25*
The ERS decreases the need for working force.			.79	.73	3.18	1.41	-26.89*
The ERS spares time which can be used for informative interaction with patients.			.76	.69	3.05	1.42	-22.53*
The ERS is more time efficient in recording nursing information.			.73	.78	3.30	1.45	-29.73*
The ERS provides integrated care.			.67	.78	3.28	1.43	-28.80*
The ERS decreases the need for verbal communication between nurses.			.64	.62	3.35	1.46	-17.63*
The ERS increase productivity.			.63	.80	3.59	1.29	-22.02*
The ERS provides sustainable care.			.53	.78	3.55	1.40	-24.91*
The ERS organizes work flow.			.53	.80	3.68	1.33	-25.74*
The ERS increases patient satisfaction.			.50	.71	3.44	1.35	-20.66*

a: n=601; b: p<.001, $n_1=n_2=162$ * All values are statistically significant (p< .05).

the items discriminated between nurses' opinions on the benefits of ERS.

In Table 2, the reliability coefficients (Cronbach's alpha) pertaining to the general and sub-dimensions of USERSNurse are given. The Cronbach alpha coefficient of the scale was found to be 0.98. The Cronbach alpha coefficients of the USERSNurse sub-dimensions ranged between 0.93 and 0.95.

In our study, the scale was re-administered to 100 nurses other than those in the sample group but who also worked at the same hospital with a 4-week interval. The test-retest reliability coefficients, which ranged between 0.62 and 0.78, were provided in Table 2. All test-retest correlations were found to be statistically significant. These findings show that the scale has sufficient reliability by means of the consistency score.

In addition, results of the Spearman-Brown split half correlations, which test the consistency between test scores, ranged from 0.91 to 0.94, indicating that the test scores were consistent and the scale was reliable.

Validity: For validity analysis, construct and content validity were examined.

Content validity: In order to generate items for The Usability Scale of the Electronic Record System in terms of Nursing Functions, a detailed literature review was carried out and similar studies were examined.[5,8,12,13,17-23] In addition, for generating content validity, a composition on experiences (emotions, thoughts, and behaviors) regarding the relevant topic were requested from the 56 respondents, which corresponded to nurses from every unit. The attitude components reported in the written compositions were systematically examined and were used in combination with information obtained from the literature in order to generate attitude statements. A draft 50-point scale was created based on a review of the literature and information received from clinical nurses. The opinions of 3 experts who had doctoral degrees in administration were sought on the 50-item scale for content validity; the experts agreed to include 38 of the items and these subsequently comprised the scale. Experts were asked to assess whether each item was 'appropriate,' 'inappropriate,' and 'maybe.' Options were removed from the item scale if they were marked "inappropriate" by at least one expert. Thus, 12 of the initial 50 points were removed and the scale became a draft 38-point scale. The 38-point scale was used in this study. After the factor analysis of the data, the 38-point scale was further shortened to 29-point scale. At the end of the study the 29-item scale was identified.

Construct validity: Confirmatory factor analysis was used for testing construct validity. In order to investigate the construct validity of the USERSNurse, the correlation matrix pertaining to all items was examined and was checked for significant correlations. Significant correlations that indicated the suitability of factor analysis were detected.

The suitability of data for factor analysis was examined using the Kaiser-Meyer-Okin (KMO) coefficient and Barlett's sphericity test. KMO should

TABLE 2: The Reliability Coefficients and Test-retest Results of USERSNurse.

						Test- Retest			
Factor	**Mean**	**Cronbach's Alpha**	**Number of items**	**Split- Test Reliability***	**Test- Retest**	**x**	**Sd**	**r[b]**	**p[c]**
1. Contributions to Nursing Practice	3.57	.95	11	.94	Test	3.69	.91	.78	p<.01
					Retest	3.79	.83		
2. Contributions to Information Management	3.88	.94	9	.91	Test	3.91	.90	.62	p<.01
					Retest	4.07	.79		
3. Contributions to Efficacy and Productivity	3.38	.93	9	.92	Test	3.00	1.00	.74	p<.01
						Retest	3,13	1.03	
USERSNurs (Total)	3.60	.98	29	.94	Test	3.55	.85	.73	p<.01
					Retest	3.67	.80		

*Spearman-Brown correlations of split-test reliability, p<0.01; [b]: Test-Retest correlation; [c]: p for Result of Test-Retest.

be higher than 0.60 based on partial correlations, the Bartlett test determines whether there is a significant relationship between variables. A significant χ^2, which is the obtained statistic, then shows that data matrix is suitable. The KMO coefficient of the scale was found to be 0.97. The result of the Bartlett test was $\chi 2=13316.37$, SD=406, $p<0.01$. Based on the results, it was decided that data was suitable for factor analysis.

In this study, the first factor was named *Contribution to nursing practice*, the second was *Contribution to information management*, and the third was *Contribution to efficacy and productivity*. The first, second, and third factors accounted for 60.04%, 5.31%, and 4.77% of the variance, respectively. Combined, the three factors explained 70.12% of the variance. Following axis rotation, 7 items were excluded from the scale because they had item-total correlations below 0.40 and 2 items were excluded because they were not significantly correlated with their corresponding factors after orthogonal rotation. Axis rotation is a method for providing independency, clarity, and significance in interpretations. After axis rotation, specific factor loadings of items increase as their loading on other factors decrease. Thus, factors match the items that are highly correlated with them and they become easy to interpret.[16] The item-total correlation ranged between 0.60 and 0.83 after item exclusion. The relevant items were excluded from the scale and the first factor contained 11 items (with factor loadings that ranged between 0.49 and 0.77), the second contained 9 (factor loadings between 0.81-0.56), and the third contained 9 items (factor loadings between 0.79-0.50), whereas the whole scale consisted of 29 items (Table 1).

The correlation coefficients between these factors that were obtained in the analysis were shown in Table 3.

DISCUSSION

In the present study, it has been demonstrated that the Usability Scale of the Electronic Records System in terms of Nursing Functions is a valid and reliable scale for measuring nurses' beliefs and opinions regarding the electronic record system.

Electronic medical records make it significantly easier for nurses to complete their daily tasks.[22,23] Electronic records increase the number and accuracy of observations via routine notifications. Organized and easy-to-access patient records facilitates generating a more comprehensive nursing care plan.[14] In addition, the use of computer-based care plans have various benefits, including risk management and analysis, and the provision of multidisciplinary care.[24,25] In our study, opinions and beliefs about the ERS included the decrease in paper work and the increase in service quality as well as the ERS's facilitating function in documentation, access to information, and generating standard procedures. These opinions regarding the ERS were grouped under the factor *Contributions to Nursing Practice*, which had a Cronbach' alpha internal consistency coefficient of 0.95.

When we compare the computer-based patient records with the paper-based (traditional) records, we observe that computer-based patient records include more accurate, easy, and accessible information, whereas paper-based patient records might contain inaccurate and missing data and are of limited use because of data discrepancies.[9] Electronic records decrease the probability of making

TABLE 3: Correlation Coefficients of USERSNurse Subscales.

Subscales	Factor 1	Factor 2	Factor 3	General
Contributions to Nursing Practice (Subscale 1)	-	79	.82	94
Contributions to Information Management (Subscale 2)		-	.83	93
Contributions to Efficacy and Productivity (Subscale 3)			-	94
Total	.94*	.93	.94	-

*p<0.001.

errors compared with paper-based records. The ERS makes it possible to use patient data in statistical analyses and research because the patient data and patient care plans are saved in the system.[14] In our study, nurses' opinions about the ERP showed that the system provides fast access to data and data security and facilitates conducting research. Scale items related to these opinions were grouped under the factor *Contributions to Information Management*. The Cronbach' alpha internal consistency coefficient for this factor was found to be 0.93.

Computer-based care plans accelerated the process of updating and recording these plans in light of objective findings. The time spent for recording care applications in computer-based record systems is significantly shorter than that of paper-based care plans.[19]

In our study, nurses' opinions about the shortened time spent for recording procedures were included in the factor *Contributions to efficacy and productivity*, which had a Cronbach's alpha internal consistency coefficient of 0.94. This value shows that the internal consistency of this factor is at a satisfactory level.

The consistency of scoring was investigated using the test-retest method. Test consistency is determined via the test-retest method.[26] If certain assumptions are met, the level of the relationship between 2 sets of scores are calculated using the Pearson correlation coefficient.[16] In the present study, all of the test-retest correlations were found to be significant.

We analyzed the split-half test reliability of the scale. Split half is a method for measuring a test's internal consistency.[26] Test items are split into equal halves in an unbiased way or based on being odd-even or being in the first-last half. Taking the relationship between the two halves into consideration, the Spearman-Brown formula was used in order to calculate the correlation for the whole test.[16] We applied this method because the statistics program we used in the study was able to conduct the analysis by splitting the test based on being in the first-last half. The results of the Spearman-Brown two-halves test correlation range was very close to 1. This is a high value for reliability. According to the two-halves test reliability, it was concluded that the test scores were consistent and the scale was reliable.

The Cronbach alpha internal consistency coefficient of the sub-groups obtained in our study range was higher at 0.79. The Cronbach alpha internal consistency coefficient of the whole scale was found very close to 1. Considering that the predicted level of reliability for instruments that are to be used in studies is 0.70, it can be said that the level of reliability pertaining to all sub-dimensions of the scale was sufficient.[27]

Considering that items with an item-total correlation above 0.30 or higher discriminate individuals by means of the characteristic that is being measured, the item-total correlations in our study seemed to be sufficient.[16] Results of the t-test which was conducted for the lower and upper 27% group scores showed that there was a significant difference between all items and sub-scales. Findings obtained from validity and reliability studies indicate that USERNurse is a valid and reliable instrument.

The suitability of data for factor analysis was examined using the Kaiser-Meyer-Okin (KMO) coefficient and Barlett's sphericity test. KMO should be higher than 0.60 and the Bartlett test should produce a significant Chi-square value. The Bartlett test determines whether there is a significant relationship between variables based on partial correlations. A significant Chi-square statistic indicates that the data matrix is suitable for factor analysis. A KMO value of 0.90-1.00 is perfect.[16,28-30] In our study, the KMO coefficient was found to be 0.97. This is considered excellent and therefore to be suitable for scale factor analysis of samples.

In order to carry out a factor analysis, there should be at least five participant data per variable.[19] In the present study, there was more than five participant data for each variable. The results indicated that data were suitable for factor analysis.

Higher loading values in the factor containing the items mean that the items measure a common concept, structure or factor. A factor loading value

of 0.45 or higher is a good criterion for selection.[16] In order to decide whether an item is related to a conceptual structure, the factor loading of the item should be at least ±0.40.[26] Seven items were excluded for the above reason because their factor loading values were below 0.40.

Axis rotation was performed during the factor analysis (orthagonal). There are two approaches to rotation, namely orthagonal and oblique. Orthagonal rotation is generally used in scale development for social sciences because there is generally a negligible difference between the two methods regarding analysis results. The most commonly-used orthagonal rotation technique is the varimax rotation. The orthagonal rotation in our study was performed through the varimax technique.[26]

Findings from the validity and reliability study of USERSNurse demonstrate that the scale is a valid and reliable instrument.

CONCLUSION

The results of the Spearman-Brown two-halves test correlation range and Cronbach alpha internal consistency coefficient of the sub-groups were very close to 1. Therefore, we can say that the scale is reliable. The Usability Scale of the Electronic Records System in terms of Nursing Functions is a valid and reliable scale for measuring nurses' beliefs and thoughts regarding the electronic patient records. The total scores obtainable from USERSNurse range between 29 and 110. Higher scores indicate that "nurses believe the ERS is usable for their functions," whereas lower scores indicate that "nurses do not believe the ERS is usable for their functions." The sub-scale scores are interpreted in a similar way. In subsequent studies, USERSNurse groups with different socio-demographic characteristics from these groups in the implementation and investigation of validity and reliability is proposed.

REFERENCES

1. Goorman E, Berg M. Modelling nursing activities: electronic patient records and their discontents. Nurs Inq 2000;7(1): 3-9.
2. Mekhijian HS, Kumar RR, Kuehn L, Bentley TD, Teater P, Thomas A, et al. Immediate benefits realized following implementation of physician order entry at an academic center. J Am Med Inform Assoc 2002;9(5):529-39.
3. Fung CH, Woods JN, Asch SM, Glassman P, Doebbeling BN. Variation in implementation and use of computerized clinical reminders in an integrated healthcare system. Am J Manag Care 2004;10(2):878-85.
4. Pizzi LT, Suh DC, Barone J, Nash DB. Factors related to physicians' adoption of electronic prescribing: results from a national survey. Am J Med Qual 2005;20(1);22-32.
5. Top M, Gider O. Nurses' views on electronic medical records (EMR) in Turkey: an analysis according to use, quality and user satisfaction. J Med Syst 2012;36(3):1979-88.
6. Ömürbek N, Altın FG. [A study on healthcare information systems use in hospitals: the case of İzmir]. SDÜ Fen Edebiyat Fakültesi Sosyal Bilimler Dergisi 2009;19:211-32.
7. Hovenga E, Gadre S, Heard S. Nursing constraint models for electronic health records: a vision for domain knowledge governance. Int J Med Inform 2005;74(11-12):886-98.
8. Park HA, Cho I, Byeun N. Modeling a terminology-based electronic nursing record system: an object-oriented approach. Int J Med Inform 2007;76(10):735-46.
9. Cho I, Park HA. Development and evaluation of a terminology-based electronic nursing record system. J Biomed Inform 2003;36(4-5):304-12.
10. Ay F. [International electronic patient record systems and relationship between nursing practices and computer]. Gulhane Med J 2009;51(2):131-6.
11. Kaymakoğlu B, Ersoy K. [Use of electronic patient records in primary healthcare]. 2. Ulusal Tıp Bilişimi Kongresi/Medical Informatics '05 Turkey 2005. p.51-6.
12. Erdemir F, Hanoğlu Z, Akman A. [Computer and internet use of nurses, and their opinion about the value of use of computers in nursing]. 2. Ulusal Tıp Bilişimi Kongresi/Medical Informatics '05 Turkey 2005. p.78-84.
13. Otieno OG, Toyama H, Asonuma M, Kanai-Pak M, Naitoh K. Nurses' views on the use. quality and user satisfaction with electronic medical records: questionnaire development. J Adv Nurs 2007;60(2):209-19.
14. Menke JA, Broner CW, Campbell DY, McKissick MY, Edwads-Beckett JA. Computerized clinical documentation system in the pediatric intensive care unit. BMC Med Inform Decis Mak 2001;1:3.
15. Tecim V. [Information technology for effective management in public institutions]. Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi 2002:17(1):141-56.
16. Büyüköztürk Ş. Sosyal Bilimler İçin Veri Analizi El Kitabı. 17. Baskı. Ankara: Pegem A Yayıncılık; 2012. p.150.
17. Moody LE, Slocumb E, Berg B, Jackson D. Electronic health records documentation in nursing: nurses' perceptions, attitudes, and preferences. CIN 2004;22(6), 337-44.
18. Kurt ME. Hastanelerde kullanılan otomasyon sistemlerinin çalışan memnuniyetine etkileri. Kahramanmaraş Sütçü İmam Üniversitesi Sosyal Bilimler Enstitüsü İşletme Ana Bilim Dalı Yüksek Lisans Projesi 2008. p.1-52.
19. Erdil E, Uğurbaş SH, Albayrak AS. Evaluation of an electronic medical record system: Zonguldak Karaelmas University Hospital Survey. ZKU Journal of Social Sciences 2010;(6(12):37-65.

20. Holtz BA, Krein S. Understanding nurse perceptions of a newly implemented electronic medical record system. Journal of Technology in Human Services 2011;29:247-62.

21. Top M, Yılmaz A, Gider Ö. Electronic medical records (EMR) and nurses in Turkish Hospitals. Syst Pract Action Res 2013;26:281-97.

22. Burkle T, Ammenwerth E, Prokosch HU, Dudeck J. Evaluation of clinical information systems. What can be evaluated and what cannot? J Eval Clin Pract 2001;7(4):373- 85.

23. Likourezos A, Chalfin DB, Murphy DG, Sommer B, Darcy K, Davidson SJ. Physician and nurse satisfaction with an Electronic Medical Record System. J Emerg Med 2004;27(4): 419-24.

24. Lee TT, Chang PC. Standardized care plans: experiences of nurses in Taiwan. J Clin Nurs 2004;13(1):33-40.

25. Thoroddsen A, Thorsteinsson HS. Nursing diagnosis taxonomy across the Atlantic Ocean: congruence between nurses' charting and the NANDA taxonomy. J Adv Nurs 2002;40(4): 372-81.

26. Şencan H. Sosyal ve Davranışsal Ölçümlerde Güvenilirlik ve Geçerlilik. 1. Baskı. Ankara: Seçkin Yayıncılık/Eğitim Dizisi; 2005. p.867.

27. Tezbaşaran AA. Likert Tipi Ölçek Geliştirme Kılavuzu. Ankara: Türk Psikologlar Derneği Yayınları; 1996. p.1-50.

28. Coşkun R, Altunışık R, Bayraktaroğlu S, Yıldırım E. Sosyal Bilimlerde Araştırma Yöntemleri SPSS Uygulamalı. 8. Baskı. Sakarya: Sakarya Yayıncılık; 2010. p.359.

29. Akgül A. Tıbbi Araştırmalarda İstatistiksel Analiz Teknikleri-SPSS Uygulamaları. 3. Baskı. Ankara: Emek Ofset; 2005. p.467.

30. Kalaycı E. SPSS Uygulamalı Çok Değişkenli İstatistik Teknikleri. 2. Baskı. Ankara: Asil Yayın Dağıtım; 2006. p.426.