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Patient Privacy Attitude Scale: A Scale Development Study

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ABSTRACT:
Purpose: The aim of this study was to develop a measurement tool to determine the attitudes of health professionals towards patient privacy.
Material and Methods: First, an item pool of 42 items was created by the researchers and expert opinion was presented. The scale form, whose language and content validity was ensured, was applied to the sample group, and the data obtained were analyzed through LISREL 8.54 and SPSS 22.0 package programs. The validity of the scale was evaluated using exploratory and confirmatory factor analyses and reliability was evaluated using Cronbach's Alpha reliability coefficient, test-retest method and item analysis.
Results: Exploratory factor analysis yielded a 27-item structure with 5 factors explaining 57.483% of the variance, eigenvalues above 1, and factor loadings above 0.53. Confirmatory factor analysis revealed that the scale showed a theoretically and statistically acceptable level of fit. The reliability of the scale was examined by test-retest method and internal consistency analysis. The total Cronbach's alpha coefficient of the scale was 0.91. There was no statistical difference between the test-retest means of the total and five sub-dimensions of the scale ($p>0.05$).
Conclusion: The analysis shows that the scale is a reliable and valid measurement tool that can be used to determine the attitudes of health professionals towards patient privacy.
Keywords: *Patient, Privacy, Attitude, Scale Development*

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INTRODUCTION

Patient privacy is one of the fundamental ethical principles of modern medicine. Patient privacy, which is also an abstract, complex and value-laden concept, is defined as an individual's desire or ability to control data about him or herself (Wilen Berg, 2011; Shen et al., 2019). According to another definition, patient privacy is the right to keep confidential personal and private information about a person's health status and treatment. This information covers a wide range of topics from the patient's health status to treatment plans and medical history (Wilen Berg, 2011). The protection of patient privacy in the provision of health services is a right provided by law. The right to privacy requires the protection of not only physical privacy but also personal data. Health data is a type of personal data that benefits from the protection of patient privacy and is closely linked to the right to privacy (Akyürek, 2013; İzgi, 2014; Atalay, 2021). The private lives of individuals include their identities, secrets, private documents, correspondence, lifestyles, physical and mental conditions, sexual lives, and all kinds of documents, information, and symptoms that constitute their content are personal data (Aydin, 2013; Atalay, 2021). Ensuring the confidentiality of the patient's data and protecting the patient's body privacy is a requirement of respect for the patient's right to privacy (Sert, 2018). Protecting the patient's health data is also a requirement for patients to trust

healthcare institutions and healthcare providers (Badur, 2012). At this point, the obligation to keep patient information confidential is the responsibility of healthcare providers and all health professionals. In order to fulfill this responsibility, it is essential that both service providers and health professionals have a high level of professionalism and ethical responsibility. Furthermore, collaboration and coordination between healthcare providers, professionals and other interested parties is necessary to ensure the security of patients' personal health information (Blightman et al., 2014; Shen et al., 2019).

There are many factors that may lead to breaches of patient privacy. For example, today's dizzying pace of technological developments has made it almost impossible to store information and protect personal privacy (Wilen Berg 2011; Blightman et al. 2014). When the infrastructure and physical problems of healthcare organizations are added to this, it can be quite difficult to ensure patient privacy. In addition, various factors related to health professionals also lead to violations of patient privacy. Health professionals sometimes share patients' personal information with other health professionals/interested parties without taking the necessary precautions to protect the patient's privacy, which may lead to breaches. Or some health professionals may access the patient's personal information in a malicious way and may want to use this information in various ways (such as blackmail or for personal gain). Lack of adequate knowledge on the subject may also lead to violations of patient privacy. Patient privacy may also be violated due to negative attitudes of health professionals. For example, some health professionals may not have sufficient awareness about respecting the privacy of their patients. In this case, they may talk about the patient's personal information or health condition with unrelated people or share information without authorization. Or health workers may not focus sufficiently on the privacy of their patients when providing services. For example, they may forget to pay attention to the patient's privacy while they are busy providing emergency care in an emergency situation.

Protecting patient privacy is one of the fundamental ethical and legal responsibilities of healthcare providers. Violation of patient privacy, regardless of the reason, leads to serious ethical, legal and legal consequences. Therefore, health professionals should be aware of patient privacy and should be trained appropriately. At this point, it is important to first determine the attitudes of health professionals towards patient privacy. In the literature review, it was determined that there are limited number of measurement tools to objectively measure the attitudes of health professionals towards patient privacy (Ozturk et al., 2014; Ozturk et al., 2019; Xu et al., 2022). However, there are scales to measure patients' attitudes towards patient privacy (Eskici et al., 2022). The aim of this study is to develop a measurement tool to determine the attitudes of health professionals towards patient privacy. This measurement tool can be used in the structuring of training contents in the trainings planned to be given to health professionals and in the evaluation of training effectiveness.

MATERIAL and METHODS

Purpose and Type of the Study

The aim of this methodological research is to develop a measurement tool to determine the attitudes of health professionals towards patient privacy.

Sampling and participant

There is no consensus in the literature regarding the determination of sample size in scale development, validity and reliability studies. However, when the number of variables is not too large and the factors are strong and significant, it is accepted that a sample size between 100 and 200 is sufficient (Buyukozturk 2013). Tavsancil (2002) states that the sample size should be between 5 or 10 times the number of items. In this study, 325 health professionals (doctors, nurses, midwives, health technicians) working in a university hospital constituted the sample of the study. Convenience sampling method was used to determine the study group.

Data Collection Tools

First, the items to be included in the item pool of the scale were created by the researchers. The literature

on the subject of the scale to be developed was reviewed and a limited number of sample scales were utilized. In this way, the scale item pool consisting of a total of 42 items was formed. In order for a scale to have content validity, all of the items included in the measurement tool should measure the measured characteristic and each detail of the measured characteristic should be questioned by the items in the scale. In other words, it can be said that a measurement tool has content validity to the extent that it measures the conceptual infrastructure of the trait it aims to measure in all aspects (Kartal and Bardakcı, 2018). In the second stage, the scale item pool was presented to 5 faculty members who are experts in the field of health sciences to be evaluated in terms of content validity. The experts evaluated each item in the item pool in terms of whether it should be included in the scale or not, and as a result of this process, the items that were out of the scope of the scale in line with the recommendations of the experts were removed from the scale item pool, and a draft scale consisting of a total of 37 items was obtained. The expressions in the scale were rearranged and the draft scale was finalized by consulting the information of an academician who is an expert in the field of Turkish Language about whether the item expressions in the draft scale were appropriate in terms of expression and spelling rules. The draft scale form was applied face-to-face by the researchers to the participants in line with the principle of voluntary participation. The scale is a 5-point Likert type scale. The items in the scale are scored as "5= Strongly Agree", "4= Partially Agree", "3= Undecided", "2= Partially Disagree" and "1= Strongly Disagree". As the scores obtained from the scale approach five, it shows that the level of agreement of the individuals with the proposition in that item is high, and as it approaches one, it shows that the level of agreement is low. There are no reverse-scored items in the scale.

Statistical Analysis

After the application of the scale to the participants, the data were transferred to the computer environment through LISREL 8.54 and SPSS 22.0 package programs and psychometric analysis of the scale was performed.

Validity: In order for a measurement tool to be valid, it is expected to be able to measure the characteristics to be measured without confusing them with different parameters. Kendall's Concordance Coefficient (W) was calculated to determine whether the scale was valid in terms of content. Exploratory factor analysis (EFA) was used to test the construct validity of the scale and confirmatory factor analysis (CFA) was used to examine the relationship between factors.

Reliability: "Reliability" and "validity" are very important issues in scale studies. In order for a measurement tool to be reliable, it should give similar results even if it is applied at different times (Akgul, 2005, Karagoz and Ekici 2004). In this study, item- total score correlation was used to test the reliability of the scale being developed, internal consistency was evaluated and test-retest analysis was performed.

Ethical Approval

In the development of the scale, approval was first obtained from the ethics committee of the university where the authors are affiliated (Decision No: 2018-02/61). The participants who participated in the scale study were informed about the purpose of the study and their contact information and consent were obtained. It was explained to the participants that the security of personal data would be protected and that the data would only be used for scientific purposes.

RESULTS

The mean age of the participants was 32.4 years (8.4), 79.1% were female, 62.5% were married, 76.3% had undergraduate/graduate education. 59.7% of the participants were nurses, 15.4% were doctors, 17.2% were health technicians, and 7.7% were midwives. 30.2% worked in internal clinics, 20.6% in surgical clinics and 49.2% in other clinics (such as emergency services, intensive care, administrative services). The mean working years of the participants was 10.1 (8.45) years, 87.7% received training on patient privacy, 48.3% of those who received training received training on patient privacy during their professional training. 52.5% of the participants found their knowledge sufficient.

Table 1. Explanatory factor analysis

Factors	Item		Load Factor	Eigen values	Variance (%)	Cumulative variance (%)
Factor 1	i 16	Protecting privacy affects patient satisfaction.	.603	8.588	31.806	31.806
	i 17	In mandatory reporting situations, health professionals take measures to protect patient privacy.	.616			
	i 18	Health professionals inform the patient about the limits of privacy.	.536			
	i 21	There are legal and criminal responsibilities for disclosing patient information.	.650			
	i 22	The patient decides whether patient information is used for medical research.	.668			
	i 23	Health professionals perform medical interventions while respecting the patient's privacy.	.726			
	i 24	It is the responsibility of health professionals to assess the patient's privacy needs.	.614			
	i 25	The patient may request to be accompanied by a relative in cases where it is not medically inconvenient.	.563			
	i 26	The patient may not want people who are not directly related to his/her treatment to be present during medical intervention.	.625			
	i 27	The patient's personal and family life does not be interfered with unless the nature of the disease requires it.	.578			
	i 31	Death does not give health professionals the right to violate patient privacy.	.632			
Factor 2	i 6	The patient can demand that his/her privacy is protected.	.811	2.836	10.505	42.311
	i 7	The patient has the right to expect respect for his/her privacy.	.837			
	i 8	The patient's medical records are privacy.	.750			
	i 10	Medical records are the patient's property in every way.	.730			
	i 12	The patient can share information about himself/herself as much as he/she "wants" to.	.585			
	i 15	The patient can decide for himself/herself with whom his/her information will be shared.	.536			
Factor 3	i 11	The principle of privacy is applied in keeping and storing patient records.	.682	1.693	6.269	48.580
	i 19	If legally required, patient information may be shared with relevant units.	.675			
	i 30	Patients retain their right to privacy even if they leave the health institution.	.765			
Factor 4	i 28	Access to patients' medical records by unrelated persons is a violation of rights.	.652	1.244	4.608	53.188
	i 29	Patients and their relatives have the right to complain and sue in case of breach of privacy.	.763			
	i 33	In health institutions, the job descriptions of employees should specify who can access what kind of data.	.569			
	i 37	Health professionals should be periodically trained on patient privacy.	.649			
Factor 5	i 1	Privacy is a fundamental human right.	.619	1.160	4.296	57.483
	i 3	Respect for privacy is a moral responsibility.	.739			
	i 9	Protecting patient privacy is as important as treating the patient.	.693			

Validity Construct Validity

In this study, the KMO statistic for the data of the 37-item draft scale was calculated as .904. Bartlett's test ($\chi 2$= 3752.997, p=0.000) was found to be significant and it was decided that the data were suitable for factor analysis.

Explanatory Factor Analysis

At this stage, exploratory factor analysis (EFA) was applied to 37 items in the draft scale using Principal Component Analysis and Varimax Rotation methods to determine the measurement structure of the scale. Ten items that did not fit under any factor and

whose factor loadings were very close in two or more factors and which could be characterized as overlapping were removed from the scale. EFA was applied for the last time to the remaining 27 items in the scale; a 5-factor structure explaining 57.483% of the variance, with an eigenvalue above 1 and a factor loading above 0.53 emerged (Factor 1: 31.806%; Factor 2: 10.505%; Factor 3: 6.269%; Factor 4: 4.608%; Factor 5: 4.296%). The eigenvalues of the factors are Factor 1: 8.588, Factor 2: 2.836, Factor 3: 1.693, Factor 4: 1.244, Factor 5: 1.160. After factor rotation, eleven items were collected under the first factor, six items under the second factor, three items under the third factor, four items under the fourth factor, and three items under the fifth factor (Table 1).

Confirmatory Factor Analysis

The scale with a 5-factor structure based on EFA was tested through confirmatory factor analysis (CFA). The compatibility of the measurement model established as a result of CFA with the data was determined with the help of fit indices. The critical values that the fit indices should provide and the values obtained within the scope of this study are given in Table 2. As a result of CFA, the fit index values of the model were calculated as $\chi 2/df=4.02$, GFI=0.87, AGFI=0.86, CFI=0.95, NFI=0.90, SRMR=0.82 and RMSEA=0.062, respectively. According to the data, it was determined that there was a good fit between the model and the observed data in terms of fit index values, and the scale showed an acceptable level of fit (Table 2).

Table 2. Standard fit index values and scale's fit index values *

Fit Measure	Good Fit Values	Acceptable Fit Values	Scale Fit Values
RMSEA	0 ≤ RMSEA ≤ 0.05	0.05 < RMSEA ≤ 0.08	0.062
SRMR	0 ≤ SRMR ≤ 0.05	0.05 < SRMR ≤ 0.10	0.82
NFI	0.95 ≤ NFI ≤ 1.00	0.90 ≤ NFI < 0.95	0.90
CFI	0.97 ≤ CFI ≤ 1.00	0.95 ≤ CFI < 0.97	0.95
AGFI	0.90 ≤ AGFI ≤ 1.00	0.85 ≤ AGFI < 0.90	0.86
GFI	0.90 ≤ GFI ≤ 1.00	0.85 ≤ GFI < 0.90	0.87
x2/df	0 ≤ x2/df ≤ 2	2 < x2/df ≤ 5	486.06 / 121 = 4.02

Abbreviations: AGFI, adjusted goodness-of-fit index; CFI, comparative fit index; GFI, goodness-of-fit index; NFI, normed fit index; NNFI, nonnormed fit index; S-RMR, standardized root-mean square residual; RMSEA, root-mean-square error of approximation (Schermelleh-Engel, K., Moosbrugger, H., and Müller, H. 2003; Meydan and Sesen, 2015)

Table 3. Test-retest reliability

		Mean	ss	t	p
Factor 1	Test	32.26	6.42	.756	.258
	Retest	32.17	6.56		
Factor 2	Test	24.16	5.48	.158	.326
	Retest	24.32	5.42		
Factor 3	Test	12.02	4.06	.712	.456
	Retest	11.98	4.06		
Factor 4	Test	16.00	6.18	1.126	.324
	Retest	16.06	6.12		
Factor 5	Test	12.18	4.12	.402	.943
	Retest	12.24	4.82		
Total	Test	128.14	16.48	1.000	.486
	Retest	127.58	16.32		

Reliability

Item analysis based on item-total score correlation, internal consistency and test-retest methods were used to evaluate the reliability of the scale consisting of 5 sub-dimensions and 27 items, which were determined to have construct validity.

Item total and correlations

In this study, item-total score correlations of the 27-item scale were evaluated. It was found that there were no items with a correlation coefficient below r=0.30 and the item-total score correlation coefficients ranged between 0.34 and 0.65. These

data show that the scale items have adequate representation power.

Test-retest reliability

At this stage, the stability of the scale was evaluated by test-rest reliability analysis. It was observed that there was no difference between the first and second measurement results of both the whole scale and its sub-dimensions (p>0.05). In this way, the fact that similar results emerged in two applications is an indicator of the reliability of the scale (Table 3).

Internal consistency

At this stage, the Cronbach α coefficients of the total and sub-dimensions of the scale being developed were calculated and analyzed. The 27-item scale has a Cronbach's Alpha coefficient of 0.915 and the internal consistency of the scale is highly reliable. The Cronbach Alpha coefficient of the 5 sub-dimensions of the scale is higher than 0.70.

DISCUSSION

In scale development studies, factor analysis is the most widely used method to reveal the measurement structure of the scale. As a result of factor analysis, information is obtained about the general factor of the scale, its sub-dimensions and the number of sub-dimensions. The existing sub-dimensions are named and the scale structure is created (Tavsancil, 2002). The first criterion for applying EFA to a data set is whether the sample size is sufficient. In scale studies, if the Kaiser-Meyer-Olkin (KMO) value is above 0.60 and Bartlett's test is significant, it is accepted that the sample is sufficient and the data are suitable for factor analysis (Buyukozturk 2013; Karagoz 2016; Karagoz 2017). In this study, the KMO value was calculated as .904, Bartlett's test (χ2= 3752.997, p=0.000) was found to be significant and it was decided that the data were suitable for factor analysis.

Then, exploratory factor analysis was applied on the data to determine the measurement structure of the scale. Rotating the factor loadings matrix helps to find a more interpretable factor structure (Buyukozturk, 2013). The most frequently used technique in rotation is varimax. In the varimax method, rotation can be performed in a way to maximize factor variances with fewer variables (Çakır 2014; Karagoz 2016; Karagoz 2017). In this study, EFA was applied to 37 items in the draft scale using the "varimax" method as a factor rotation method. A 5-factor structure explaining 57.483% of the variance, with an eigenvalue above 1 and a factor loading above 0.53 was obtained (Table 1). According to Kline (2014), it is sufficient for the explained variance to be 40% or more. There are opinions in the literature that the lower limit for the total variance explained should be between 40% and 60% (Karagoz, 2016). Accordingly, it can be said that the variance explained by the construct is sufficient in terms of construct validity. According to Buyukozturk (2013), factor loading values of the items obtained as a result of EFA are considered sufficient if they are above 0.45. It was determined that the factor loading values of the items of the developed scale varied between 0.53-0.83. In this context, it can be stated that the factor loading values of the items are quite high and sufficient. Eigenvalue is an important coefficient used to determine the appropriate number of factors and in practice, factors with an eigenvalue of 1 or greater than 1 are generally taken as appropriate factors (Buyukozturk, 2013). In this study, 5 sub-dimensions with eigenvalues greater than 1 were obtained. As a result of CFA conducted on another independent sample after EFA, it was determined that the model consisting of 5 sub-dimensions and 27 items showed an acceptable level of fit with the data. Whether the measurement model established as a result of CFA is compatible with the data is determined with the help of fit indices. In the literature, values such as χ2/sd, GFI, AGFI, CFI, NFI, SRMR, RMSEA, etc. are widely used (Karagoz, 2016). The critical values that these indices should provide are given in Table 2. In this study, it was determined that there was a good fit between the model and the observed data in terms of fit index values, and the developed scale showed an acceptable level of fit (Table 2).

Item-total score correlation is an objective measure that reveals the correlation relationship between the scores obtained from each item in a scale and the total score obtained from the scale (Tezbasaran, 1996). The limit value for item-total correlation is 0.30 (Buyukozturk 2013). Items with an item-total

correlation higher than 0.30 are considered to move in a similar direction with the overall scale (Buyukozturk, 2013). In this study, item-total score correlation coefficients ranged between 0.34-0.65. These data show that the scale items have sufficient representation power. Stability is a reliability criterion sought in measurement tools that aim to measure characteristics such as attitudes that are continuous and do not change easily (Tavsancil, 2002; Aksayan and Gozum, 2002). The stability of the scale was evaluated by test-retest method. No statistically significant difference was found between the scores of the scale and its sub-dimensions administered two weeks apart (Table 4). In Likert-type scale development studies, there is an assumption that each item should basically measure the same attitude (Tavsancil, 2002). In order to check this assumption and to determine the level of reliability, it is considered appropriate to use Cronbach's α coefficient in the literature. The higher the α coefficient of the scale, the more consistent the items in the scale are with each other (Tezbasaran, 1996). Cronbach's α internal consistency coefficient, like other reliability coefficients, can be interpreted as reliable if it takes a value greater than 0.70. The total Cronbach's Alpha coefficient of the 27-item scale is .915, and the internal consistency of the scale is highly reliable. The Cronbach Alpha coefficient of the 5 sub-dimensions of the scale was found to be higher than 0.70.

CONCLUSION

In line with the data obtained, it can be said that the Patient Privacy Attitudes Scale is a valid and reliable measurement tool that can be used to determine the attitudes of health professionals towards the subject.

Limitations

This study has some limitations. The item pool of the scale consisted of 42 items. In future studies, the item pool can be expanded by adding new items to reflect different attitudes and more comprehensive measurement tools can be developed. The findings of the study are limited to the data obtained from the sample. Discipline-specific measurement tools can be developed in future studies.

Conflict of Interest

There is no conflict of interest.

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