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Translation and Psychometric Properties of the Persian Version of Patients' Perceptions of Safety Culture Scale in the Hospital Setting

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ABSTRACT

Introduction:
Patient safety culture (PSC) was considered an essential predictor of healthcare quality. Measurement of PSC required a valid and reliable scale. So, the current study aimed to determine the validity and reliability of patients' perceptions of safety culture scale (PPSCS) in the context of Iran.

Materials and Methods:
This study was a scale psychometric assessment in the Iran context. Current study had three phases: preparation, translation and psychometric evaluation. Scale translation was performed based on the forward-backward framework. Face and content validity, test-retest reliability, and internal consistency were evaluated. Also, corrected item-total correlation for each item was reported based on data collection from 119 patients admitted to Esfarayen Imam Khomeini hospital. Analysis was done in SPSS V.16.

Results:
Content validity ratio (CVR) and content validity index (CVI) were between 0.8 to 1. Also, corrected item-total correlation was between 0.604 and 0.864. Intra correlation coefficient (ICC) and alfa Cronbach were 0.974 and 0.939, respectively.

Conclusion:
Results showed PPSCS had acceptable validity and reliability in the Iran context. This scale can apply in different studies to measure patients' perceptions of safety culture in different hospital settings.

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Introduction

Patient safety (PS) is considered one of the most important rights of patients admitted to the hospital. Despite many advancements in healthcare quality, the PS in healthcare systems is challenging worldwide (1).

Institute of Medicine has emphasized the creating of a safety culture among healthcare organizations to improv PS and quality of care. Patient safety culture (PSC) was defined "the product of individual and group value, attitude, perception, competency, and behavioral pattern that determine the commitment, method, and efficiency of the healthcare organization" (2).

The concept of safety culture has been used not only in medical sciences, but also in the industry, for more than two decades (3). In medical sciences, PCS has been developed, and used in different studies (4).

Several factors can influence the development and promotion of the PSC in the hospital including management and direct supervision, training and attitude of employees, enacting clear and practical laws and policies, confirmation of reporting system, root cause analysis, and giving feedback to the staff (5).

PSC is considered one of the sub-categories of organizational culture. As a result, it should put the main priority of the organizations and employees. The measurement of PSC is an important step in finding out the PSC status and lowering weaknesses and promoting the strengths (6). To measure the safety culture among the medical staff, various scales have been designed abroad in Iran including the "Hospital Survey on Patient Safety Culture" (HSPSC), "Safety Attitudes Questionnaire" (SAQ), "Self-designed patient safety culture questionnaire" (SPSCQ), and "Patient Safety Climate in Healthcare Organizations Survey" (PSCHOS). These questionnaires have examined the PSC from the perspective of the medical staff (7).

The HSOPSC has been psychometrically evaluated in Iran (6,8). Although the measurement of the PSC from the employees' perspective provides valuable information to the managers, there is a gap in this type of measurement. The perception of patients as the main consumers of healthcare services have not been taken into considered. Therefore, it is necessary to examine the PSC in the hospital from the perspective of patients.

In this regard, the "Patients' Perceptions of Safety Culture in the Hospital Setting" scale was designed in Germany. Also, Exploratory factor analysis of questionnaire was assessed after data collection from 22225 patients via an online survey. The questionnaire consisted of eleven items and six factors including feeling safe (2 items), information flow (4 items), teamwork (2 items), and each of the factors of communication with patients, communication in the care team, and staffing had one item. Patients selected their responses on a Likert scale from strongly agree, agree, disagree, strongly disagree, and not applicable**.**

This questionnaire measured the PSC from the perspective of patients. Reliability and validity of this scale were not assessed in the Iran context. Considering the importance of patients' perceptions, as they are the main stakeholders in the health system, it is necessary to examine their views as well. The measurement of patients' perception of PSC can assist the manager and the policymaker to regulate applicable rule and policy. Therefore, the present study aimed to translate and determine the psychometric properties of PPSCS.

Materials and Methods:

The current study was a cross-sectional study design that was conducted under the supervision of the ethics committee of Mashhad university of medical sciences. Current study had three phases: preparation, translation and psychometric evaluation (Table. 1).

Preparation

Protocol of study approved at Mashhad university of medical sciences with Ethical code: IR.MUMS.NURSE.REC.1401.063. Permission was obtained from the designer of the PPSCS to carry out the psychometric properties in Iran.

Translation:

The forward-backward framework was used to translate the PPSCS questionnaire to Farsi. Firstly, the scale was translated from English to Farsi language by two translators. Farsi translation was assessed in the experts panel which included specialists in the field of

scale development, the concept of PSC, and the English language. The translated text was checked for clarity, simplicity, grammaring, and wording. The translation approved in the previous stage was translated from Farsi to English by two language experts who are different from the first stage.

The comparison of the new English translation with the original version is reviewed by a panel of experts to reach a unit result. Both new English and Farsi translations send via email to the designer of scale. Also, ten patients admitted to Imam Khomeini hospital of Esfarayen evaluated the Farsi translation regarding difficulty and fluency.

The final revision was done in the experts' panel. After the completion of the translation process, the validity and reliability of the Persian version of PPSCS were performed that was determine following (Table. 1).

Table 1: Summarization of study protocol and measurements

Phase	steps	Measurements
Preparation	1- obtaining permission	Sending an email to the correspondence author.
	2- Register the proposal	Approve the research project at Mashhad University of Medical Sciences.
Translation	3- Forward translation	Translation done by 2 translators from English to the Farsi.
	4- Editing translations	Reviewing translations by the research team.
	5- Backward translation	Translating the Persian version into English.
	6- Synchronization of translated versions	Reviewing the controversy between the Farsi and English version in the expert panel.
	7- Cognitive interview	Conducting a cognitive interview with ten patients admitted in the hospital about the clarity and difficulty of each item.
	8- Final approval	Final review and approval of the scale translation by the expert panel.
Psychometric evaluation	9- Qualitative Face validity	Based on view points of the admitted patients.
	10- Quantitative face validity	Calculation of impact item score.
	11- Qualitative Content validity	Questionnaire completed by ten experts and gave their opinions about grammaring, wording, scoring, and scaling.
	12- Quantitative content validity	Calculation of content validity ratio (CVR) and content validity index (CVI).
	13- Construct validity	Reporting of corrected item-total correlation.
	14- Test-retest reliability	Reporting of intraclass correlation (ICC).
	15- Internal consistency	Calculation of Alpha coefficient.

Psychometric evaluation

The research environment was Imam Khomeini Hospital in Esfarayen city. The inclusion criteria included conscious patients discharged from the hospital who volunteered to participate in the study. Patients who were not admitted to the hospital wards or who did not agree to participate in the study were excluded. Validity and reliability were performed to determine the psychometric properties of the questionnaire. Face validity was done both qualitatively and quantitatively methods (9). The Farsi questionnaire version gave to the ten patients and their comments about grammaring, wording, fluency, and scaling were asked. We measured the quantitative face validity by calculating the item impact score. This score was based on how ten patients rated each item from 1 (not at all important) to 5 (absolutely important). The Formula for calculating of item impact score was: importance* percent frequency answers of 4 and 5. Content validity was done qualitatively and quantitatively methods. In

the qualitative content validity, the questionnaire gave to the ten experts including physicians and nurses to give their opinions about grammaring, wording, scoring, and scaling. The content validity ratio (CVR) and content validity index (CVI) was reported based on experts' opinions (9,10). The CVR value greater than 0.62 was acceptable based on the Lawshe table (11). Also, the CVI greater than 0.79 was considered a good level (12). One of the methods for the measurement of construct validity is exploratory and confirmatory factor analysis. In the present study, three factors had a single item, so it was impossible to perform factor analysis, so the corrected item-total correlation was reported (13). Test-retest method was used to report stability reliability. Therefore, Intra-cluster correlation (ICC) was reported with consideration of a 95% confidence interval. A value greater than 0.8 was acceptable (14). Cronbach's alpha was also calculated to assess internal consistency. A value of more than 0.7 was considered acceptable (15,16).

Results

Qualitative and quantitative face validity:

Based on the opinions of ten patients, changes were made in the sentences of the questionnaire. For example, the sentence of the third item, "the exchange of information between physician and nurse was carried out continuously" was converted to "I witnessed the exchange of information between physician and nurses" in this stage. The results of the impact item score showed that the lowest and highest scores were 2.22 and 4.6, respectively (Table 2).

Quantitative and qualitative content validity:

According to the experts' opinions, changes were made in the sentences of the questionnaire.

For example, the sentence of sixth item "After hand over the shift (change of shift or transfer), the personnel knew all the information needed to take care of me" converted to "Every new nurse who started taking care of me, knew all the information needed to take care of me".

The result of CVR was calculated based on experts' opinions for each item between 0.8 and 1. Also, the CVI rate was between 0.8 and 1. This was higher than the minimum acceptable value of 0.79. Therefore, the quantitative content validity of the questions was confirmed (Table 2).

Corrected item-total correlation:

The results related to Item-dimension correlation showed that it is between 0.604 and 0.864 (Table 2).

Test-retest reliability and internal consistency:

The result of the test-retest showed that the average ICC was 0.947 and therefore had good reliability. Also, Cronbach's alpha was 0.939, which was excellent (Table 2).

Table 2: Psychometric properties of Farsi version of PPSCS

Items	Impact item score	CVR	CVI	Corrected item-total correlation	Cronbach's α
Q1	2.66	0.8	0.8	0.673	0.724
Q2	3.2	0.8	0.9	0.678	
Q3	3.28	1	0.9	0.725	0.983
Q4	2.22	0.8	0.9	0.604	
Q5	3.96	1	1	0.843	
Q6	4	1	1	0.851	
Q7	3.28	1	0.9	0.863	0.958
Q8	3.04	0.8	0.8	0.864	
Q9	4.6	1	0.9	0.621	-
Q10	2.8	1	1	0.678	-
Q11	3.36	0.8	0.8	0.741	-
PPSCS: patients' perceptions of safety culture scale, CVR: Content validity ratio, CVI: Content validity index					Total:0.939

Discussion

The present study aimed to translate and determine the psychometric properties Farsi version questionnaire of the "Patient's perceptions of the safety culture in the hospital settings". After forward-backward translation, face validity, content, and reliability were done through test-retest, internal consistency, and item-dimension correlation.

The results showed that quantitative face validity, quantitative content validity, corrected item-total correlation, test-retest reliability, and Cronbach's alpha are at a suitable level. Therefore, PPSCS can be used as a valid and reliable questionnaire in the Iran context.

In Iran, the "Hospital Survey on Patient Safety Culture" questionnaire, which is related to patient safety culture, has been psychometrically evaluated. Although the PPSCS, examined the PSC from the patient's perspective, this questionnaire evaluated the PSC from the hospital staff's point of view. This questionnaire has 42 items and 12 factors.

The reliability of the scale was measured using internal consistency and Cronbach's alpha. The estimated value of Cronbach's alpha was 0.82. Each factor in this questionnaire had at least three items; therefore confirmatory factor analysis was used on a sample of 420 hospital staff (17). On the other hand, the PPSCS questionnaire included six factors, three of which had one item, so it was impossible to perform construct validity. In most studies, it is recommended that each factor in the questionnaire have three to five items (18).

The comparison of the HSPSC and PPSCS regarding the dimensions showed that the PPSCS had a five-point Likert scale (strongly agree, agree, disagree, strongly disagree, and not applicable) which had six dimensions: the feeling of security (2 items), information flow (3 items), teamwork (2 items), and each of communication with patients, communication in the care team and staffing factors had one item. The HSPSC had 12 factors including Teamwork within units, Supervisor/manager expectations & actions promoting patient safety, organizational learning- continuous improvement, management support for patient safety, overall perceptions of patient safety, feedback & communication about the error, communication openness, frequency of events reported, teamwork across units, staffing, handoffs & transitions and non-punitive response to errors (19). Factors such as teamwork, staffing, and communication are important principles of PSC that are common in both scales.

The present questionnaire was not psychometrically evaluated in other countries based on our extensive search. In fact, current questionnaires related to the PSC are focused on other target groups such as nurses, and physicians, and do not consider patients. So, the current questionnaire paid attention to the point of view of patients, and can cover this gap (17).

We cannot perform confirmatory factor analysis because three of the six factors had only one item. It can be one limitation of current research. However, the corrected item-total correlation was reported.

Conclusion

Results showed PPSCS had acceptable validity and reliability in the Iran context. This scale can apply in different studies to measure patients' perceptions of safety culture in different hospital settings.

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