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Translation and Psychometric Assessment of the Persian Version of Patient Trust in Midwifery Care Scale

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Abstract

Background: Patients' trust in their physicians can affect therapeutic outcomes. Measurement of patient's trust levels is a helpful approach for policymakers in healthcare systems.

Aim: The present study was targeted toward the translation and psychometric assessment of patients' trust in midwifery care questionnaire.

Method: This cross-sectional study was conducted on 210 female patients referring to the midwifery offices of Tehran, Iran, in 2017. After the translation and back translation of the original version of patient's trust questionnaire, exploratory and confirmatory factor analyses were performed to measure the structural validity and reliability (through Cronbach's alpha coefficient and intra-class correlation) of the instrument.

Results: Measurement of the questionnaire validity by exploratory factor analysis revealed three factors with the eigenvalues of > 1. The three extracted factors accounted for 73.24% of total variance. The goodness of fit indices revealed that the fitness of the three-factor model was at a desirable level, rendering a χ^2/degree of freedom of 2.34, comparative fit index of 0.96, and root mean square error of approximation of 0.07. The reliability of the scale was confirmed with a Cronbach's alpha coefficient of 0.81 and intra-cluster correlation of 0.96.

Implications for Practice: The patients' trust questionnaire, measuring the extent of patient's trust in midwifery offices in Tehran, is a proper tool, enjoying appropriate validity and reliability. The results of the study also showed that the Persian version of the tool can be used to measure the trust rate of the patients referring to the midwifery offices in Iran.

Keywords: Midwifery, Patient, Psychometrics, Trust

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Introduction

Trust in physicians can be defined based on the patient's optimistic acceptance of his/her vulnerable health status and the belief in the properness of the healthcare services provided by the medical team (1). Trust is considered as a great social capital (2) and a key component of interpersonal interaction in healthcare provider-patient relationship (3) that can affect the outcomes of healthcare services (4). It is clear that the trust between medical service providers and patient is not only dependent on their relationship, but it is depend on factors related to health care institutions, professional, legal and political factors, as well as the payment methods of medical care costs (5). Patients' satisfaction simultaneously increases with the enhancement of their trust in medical staff (6). Despite the paramount importance of the examination of patients' trust in healthcare services, few studies have investigated this issue; accordingly, there is a wide scientific gap in this domain (7).

Different tools have been developed to measure patients' trust in healthcare providers. For example, trust in physician scale examines the relationships between patients and their physicians (8). In addition, Stanford scale addresses the relationship between treatment acceptance and patient's trust (9). These measures have been translated into different languages and subjected to psychometric assessment across the world (10, 11). Patient Trust Scale (PTS) is another instrument developed by Kao et al. in 1998 to measure patients' trust in physicians with acceptable validity and reliability (12).

Financial issues or the method of paying the fees of healthcare services is one of the most important factors affecting patients' trust in their physicians. Given the consideration of this issue in the PTS, it was opted for psychometric assessment in the present study (12). According to the results of the studies conducted in Iran, 70% of the women of childbearing age who have referred to the public and private midwifery centers have been satisfied with the services provided by the midwives (13, 14). However, to the best of our knowledge, no study has measured patients' trust in their midwives yet. With this background in mind, the current study was conducted to translate and psychometrically assess the PTS to be employed for the Iranian women referring to midwifery offices in Tehran, Iran, in 2018.

Methods

This cross-sectional study was targeted toward the psychometric analysis of the patients' trust in midwives questionnaire. For the purpose of the study, the women referring to the midwifery offices in Tehran were included in the study. The sample size was calculated based on the number of the items; in this regard, 20 respondents were selected per item (15). Therefore, given that the questionnaire includes 10 items, the sample size was determined as 200 individuals. The inclusion criteria were: 1) childbearing age, 2) residency in Tehran, 3) referral to the midwifery offices for prenatal visits or gynecological conditions in 2017, and 4) selection of a midwife with a bachelor or master degree as one's physician.

The study population was selected using consecutive sampling technique. The sampling was performed in the midwifery offices in the west and south of Tehran. A total of 210 eligible women were selected to fill the questionnaire. The PTS includes 10 items, 5, 3, and 2 cases of which are related to the care, therapeutic cost/health insurance, and referral process, respectively. In this questionnaire, each item is rated on a 5-point Likert scale (at all=1, rarely=2, somewhat=3, often=4, and totally=5).

After developing the questionnaire and acquiring permission from the original scale designer, Audiey C. Kao, the original English version of the questionnaire was subjected to translation by two individuals having a good command of English and Persian using forward and backward translations. Then, the translations were compared; in this regard, the items were examined in terms of meaning and concept, and the best options were selected to develop a Persian questionnaire. The Persian questionnaire was back-translated by two individuals having a good command of English and Persian who had not seen the questionnaire before its translation into English. The final version was sent for the questionnaire designer to achieve his confirmation.

In order to examine the qualitative and quantitative validities of the Persian version of the tool, the opinions of 10 women referring to the midwifery offices were acquired to reveal difficulty level, relevancy, vagueness, or semantic ambiguity of the translated questionnaire. The comments were applied into the questionnaire as minor changes. In order to examine quantitative face reliability, the opinions regarding the importance of each item in measuring the issue under investigation were collected in form of a 5-point Likert scale (i.e., very important, somewhat important, moderately important, of little importance, and not important at all). Subsequently, the eigenvalue was calculated for each item, and if an item had an eigenvalue of > 1.5, it was considered appropriate for analysis and retained in the questionnaire.

In order to examine the content validity of the questionnaire, the opinions of eight midwifery professors regarding each of the items were obtained in a written form. Minor modifications were implemented, and grammatical and word choice issues were considered in the instrument. The questionnaire once again was returned to the same professors to be examined in terms of the quantitative analysis of the content. According to their comments, content validity index (CVI) was calculated based on clarity, simplicity, and relatedness. Furthermore, content validity ratio (CVR) was calculated based on three parts of necessary, useful but not necessary, and unnecessary.

In order to measure the construct validity, exploratory and confirmatory factor analyses were run in two steps. In the first step, the validity of the patient's trust questionnaire was evaluated to extract the latent factors. The extraction of the factors in confirmatory factor analysis was accomplished using maximum likelihood estimation. Given the lack of a significant correlation between the factors, varimax rotation was used for extracting factors in exploratory factor analysis. Sampling adequacy was calculated using Kaiser-Meyer-Olkin (KMO) and Bartlett's tests.

In the next step, confirmatory factor analysis was used to determine the construct validity of the instrument. In order to examine the construct validity subtypes, including convergent and divergent validities, construct reliability index, average variance extracted (AVE), maximum shared squared variance (MSV), and average shared squared variance were employed. In addition, goodness of fit test on χ^2/degree of freedom (df) and parsimony normed fit index, goodness of fit index (GFI), adjusted GFI, parsimony GFI, incremental fit index, relative fit index, root mean square error of approximation, root mean square residual , normed fit index, and non-normed fit index were calculated in order to examine the GFI of the questionnaire final model.

The reliability of the instrument was measured using Cronbach's alpha coefficient for the whole questionnaire and each factor separately (16). Determination of time stability or test-retest reliability is usually performed within an interval of 2 weeks to 1 month (17). In the current study, the questionnaires were handed to the women in an interval of one-month to calculate intra-class correlation coefficient (ICC). If the ICC is higher than 0.8, the questionnaire is considered to have an appropriate reliability (18).

In the current research, data analysis was performed in SPSS (version 22) and EQS (version 6.1). The protocol of the study was registered in the Obstetrics and Gynecology Committee. Data collection was performed after obtaining ethical confirmation from the Ethics Committee of the Faculties of Pharmacy and Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Furthermore, the participants were informed about the study objectives and ensured about the confidentiality of their information. Furthermore, written informed consent was obtained from all subjects. The participants were required to fill out the questionnaire after registering their demographic information (i.e., age, marital status, occupational status, number of referrals to the midwifery offices, and reason of late referral to the midwifery offices).

Results

In this study, 210 women of childbearing age were recruited as respondents. The mean age of the respondents was 31.24±6.993 years (age range: 17-57 years). In terms of

occupational status, 83.3% of the subjects were housewives. Furthermore, 53.4% of the participants were multigravida, and 39.5% of them had referred to midwifery offices to receive prenatal care.

In order to evaluate the validity qualitatively, first, some amendments were conducted based on the comments of 10 patients referring to the midwifery offices. The quantitative part involved the estimation of the eigenvalues of all items. In this regard, if an eigenvalue was higher than 1.5, it was retained in the questionnaire. Finally, 10 items were identified as appropriate in terms of intelligibility, and no item was removed from the analysis. The content validity was also evaluated qualitatively, and the necessary modifications were administered. In the quantitative part, given that our panel consisted of eight specialists, the minimum acceptable CVR for the Lowsheh table was calculated as 0.75 (19). The results revealed that all items obtained the minimum required score.

According to the index developed by Waltz and Bassel and after calculating CVI by summing up the scores of each item, the items with the CVIs greater than 0.78 were regarded as appropriate, and consequently were accepted (20). As a result, all examined items obtained the minimum required CVI score, and all 10 items were retained and used for later analysis. The study was conducted on 210 female patients referring to the midwifery offices. The KMO index was calculated as 0.805 regarding the sample size adequacy, which was within the favorable level; accordingly, the results of Bartlett's test were statistically significant ($P<0.001$).

Correlation between one item and related factor is indicated through factor loading. A factor loading of 0.3 is conventionally indicative of a weak relationship between the factor and item. It is better to remove such an item because it cannot well clarify the variable. A factor loading of 0.3-0.6 is acceptable, while a factor loading of > 0.6 is considered desirable (21). As indicated in Table 1, factor loadings were above 0.5 for all items; therefore, there was no need for item omission.

The results of the varimax rotation method revealed that the items were loaded on three factors. These results are illustrated in Figure 1 in form of a Scree plot. In this regard, the first, second, and third factors were related to professional, coordination, and financial management skills, each of which entailed 5, 2, and 3 items, respectively. Furthermore, 3 out of the 10 investigated items accounted for 73.24% of the variance. Table 1 presents the results of exploratory factor analysis.

Table 1. Factor loadings of the extracted factors in the exploratory factor analysis of patient rust scale

Items	Factor 1 Professional skill (5 items)	Factor 2 Coordination skill (2 items)	Factor 3 Financial management skill (3 items)
1. Does she attach more importance to your health and well-being than the treatment fees?	0.831		
2. Does she keep the sensitive and important personal information related to your health status confidential?	0.740		
3. She provides you with the information related to all therapeutic methods rather than only focusing on the methods that are covered by health insurance.	0.736		
4. Does she refer you to the specialist physician if necessary?		0.683	
5. Does she refer you to the hospital for admission if necessary?		0.545	
6. Does she make appropriate decisions without considering legal limitations and insurance instructions?			0.686
7. Does she evaluate the medical cares delivered to you?	0.736		
8. Does she perform medical tests and necessary measures without considering their costs?			0.711

9. Does she provide you with high-quality midwifery services?	0.815	
10. Does she simply perform necessary tests and measures?		0.812

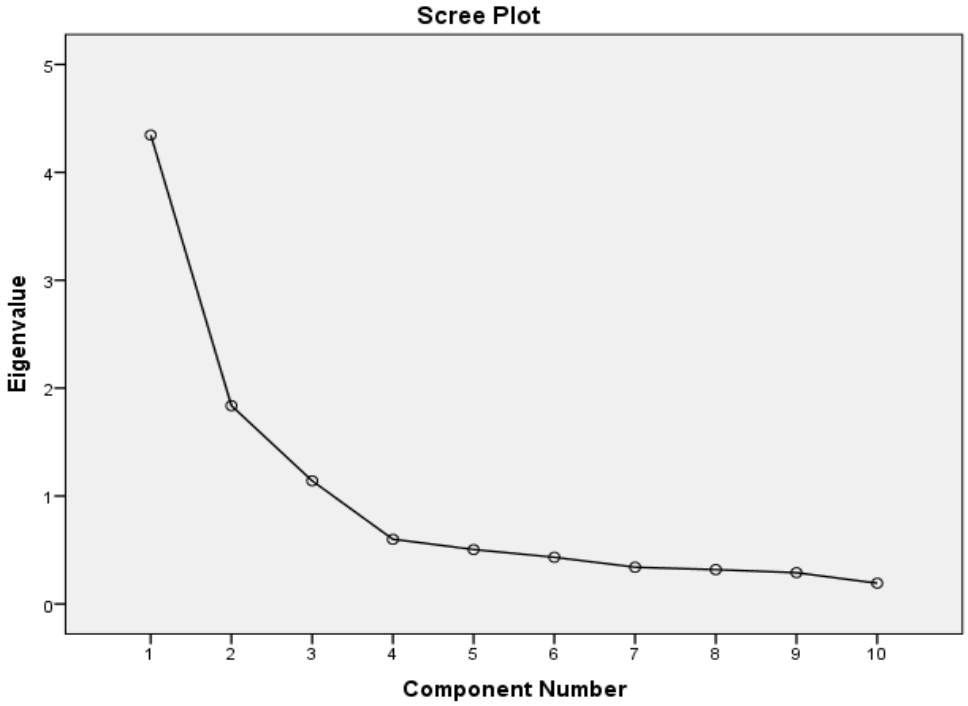
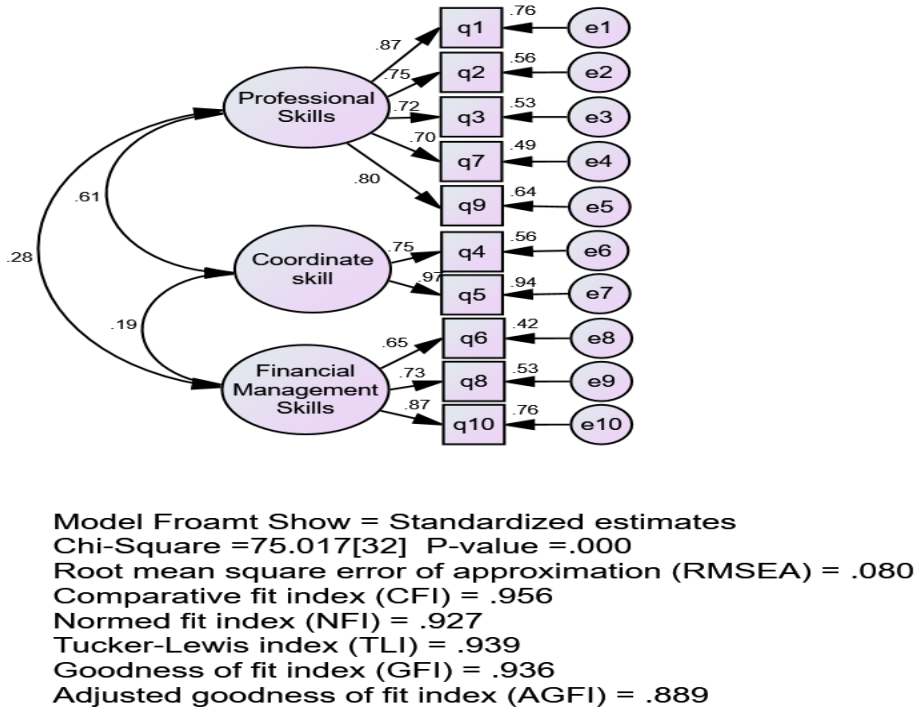


Figure 1. Identification of three factors in a Scree plot



Model Froamt Show = Standardized estimates
Chi-Square =75.017[32] P-value =.000
Root mean square error of approximation (RMSEA) = .080
Comparative fit index (CFI) = .956
Normed fit index (NFI) = .927
Tucker-Lewis index (TLI) = .939
Goodness of fit index (GFI) = .936
Adjusted goodness of fit index (AGFI) = .889

Figure 2. A confirmatory factor model for patient trust scale with standard factor loadings

Figure 2 displays the confirmatory factor analysis model, in which the factors extracted from this model were confirmed. This model was presented as a first-order confirmatory factor analysis model. Table 2 also demonstrates the indices related to the goodness of fit. The results revealed that the model fit indices were in a good or at least acceptable level in

terms of all GFIs. The only index that was in an unacceptable range was the significance level (p-value) of the Chi-square test. This result was predictable according to the sample size. Therefore, instead of using the significance level, χ^2/df was applied in the study.

After assuring the goodness of fit of the model, the results indicated that the construct

Table 2. Goodness of fit indices for confirmatory factor analysis model of patient trust scale

Goodness of fit index	Index range for acceptable fitness	Index range for good fitness	Observed goodness of fit index	Result
χ^2 (df)	The ratio of X2 to a		75.02 (32)	Good fitness
P-value of χ^2 test	degree of freedom	χ^2/df<3	<0.05	Inappropriate fitness
χ^2/df	less than 5		2.34	Good fitness
RMSEA	<0.08	<0.05	0.07	Acceptable fitness
CFI	>0.90	>0.95	0.96	Good fitness
NNFI	>0.90	>0.95	0.94	Acceptable fitness
GFI	>0.85	>0.95	0.94	Good fitness
AGFI	>0.85	>0.90	0.89	Acceptable fitness

df: degree of freedom, RMSEA: root mean square error of approximation, CFI: comparative fit index, NNFI: non-normed fit index, GFI: goodness of fit index, AGFI: adjusted goodness of fit index

Table 3. Validity and reliability of patient trust scale constructs

Factor	Mean±SD	Cronbach's alpha	Intra-class correlation coefficient		A 95% confidence interval for Intra-class correlation coefficient	Standard error of measurement	Construct reliability	Average variance extracted	Maximum shared squared variance
			Intra-class correlation coefficient	P-value					
Professional skill	22.35±2.03	0.88	0.93	<0.001	0.84-0.97	0.53	0.88	0.60	0.37
Coordination skill	14.27±1.19	0.84	0.87	<0.001	0.68-0.95	0.42	0.86	0.75	0.37
Financial management skill	8.45±1.85	0.88	0.96	<0.001	0.90-0.98	0.37	0.80	0.57	0.08
Total	45±4.2	0.81	0.96	<0.001	0.91-0.98	0.84	=	=	=

reliability of the instrument was higher than 0.7 (Table 3). Furthermore, all standard factor loadings were greater than 0.5, and therefore significant (P<0.05). Consequently, the presence of all items in each construct was confirmed. In addition, given that the AVE value was higher than 0.5, and the construct reliability value was greater than AVE, it could be concluded that the convergent validity conditions were satisfied. For each construct, the AVE was higher than the MSV; accordingly, it can be concluded that the construct had a differential validity.

Internal consistency of the constructs

Table 3 presents the results regarding the internal consistency of the factors. The ICC was greater than 0.8 for all factors, which is indicative of a high consensus among the respondents. The p-value resulted from the paired sample t-test was also higher than 0.05, indicating that the mean score of the factors was not significant in each measurement time.

Discussion

The present study is the first attempt measuring the validity and reliability of the Persian version of the PTS in Iran. The exploratory and confirmatory factor analyses resulted in the achievement of a 10-item Persian version of the questionnaire with three factors. This scale had acceptable validity and reliability among the statistical population who were the patients referring to the midwifery offices in Tehran. If χ^2/df is less than 3, the model fit will be proper, and if it is less than 5, it will be acceptable (22). In the current study, χ^2 was obtained as 75.02, and df was estimated as 32. Therefore, χ^2/df was calculated as 2.34 representing that the questionnaire enjoys proper fitness.

Furthermore, in terms of reliability (IIFAS-I), the internal consistency of the instrument was determined by means of Cronbach's alpha coefficient (α=0.81). In addition, the ICC

was calculated as 0.96, which is indicative of acceptable time stability. The alpha coefficient of PTS tool was reported as 0.94 at the time of its development (12). However, Cronbach's alpha coefficients for the Trust in Physician tool were reported as 0.85 during its development and 0.707 at the time of its psychometric assessment in the Indian language (8, 23).

Our developed Persian version consisted of three factors related to different skill areas, including professional (n=5), coordination (n=2), and financial management (n=3) skills. On the other hand, in the psychometric assessment conducted on the Trust in Physician questionnaire, the items were divided into two domains of trust and doubt. In the mentioned study, it was shown that the relationship between patient and physician affected patients' trust or doubt in physician (24).

Another study involved the psychometric assessment of the same tool in India. In the mentioned study, the questionnaire items were categorized into four factors, the most important of which were physicians' professional skill and secrecy (23). Furthermore, in another study, a good relationship between patient and physician was categorized in three domains, namely coordination, trust, and empowerment (25).

Attention to the three skill areas obtained in the current study can be considered a big step toward the enhancement of patients' trust in midwifery care services. Since more than half of the professional skills of a midwife are obtained clinically, it is required to consider high-quality clinical teaching in the midwifery curriculum and educational retraining (26). In addition, given that midwives are in the front line of healthcare systems, the improvement of coordination skills, especially referring the patients on time to the hospital or gynecologists in emergency cases, is of high importance in disease management (27).

Financial management is a skill that is used at all levels of healthcare services in order to choose the therapeutic options. Therefore, a midwife can be very helpful in treating the patients, especially in case of people without insurance coverage, through suggesting an appropriate financial roadmap to reduce the therapeutic costs (28). With regard to the skill areas obtained in the current study, it can be concluded that the empowerment of midwives is important not only in the professional skill area, but also in the improvement of coordination and financial management skills. To this end, the universities of medical sciences and Ministry of Health and Care Services should implement specialized training and retraining programs.

It is suggested to perform further studies regarding patient's trust in private midwifery services in the different cities of Iran. The results of such studies would be helpful in encouraging the insurance authorities to cover all midwifery services provided in midwifery offices. One of the limitations of the present study is that the scale under study has not been used in the countries other than the research community of the original developer. Consequently, it was not possible to find similar studies to compare the psychometric results of the scale in different communities. The other limitation of the study is that its results cannot be generalized to other settings due to the limitations of the study location. Therefore, it is required to investigate more variant environments using a higher confidence level and a larger sample size.

Implications for Practice

The results of the study showed that PTS is an appropriate tool to measure the trust of the patients referring to the midwifery offices in Tehran since it enjoys appropriate validity and reliability. Therefore, this instrument can be used to examine the extent of patients' trust in midwifery services in Iran and in the Persian language.

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cooperation.

Conflicts of Interest

Hereby, the authors announce that there is no conflict of interest in writing this paper.

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