Psychometric evaluation of the Turkish language Person-Centered Climate Questionnaire-family version

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ABSTRACT

Aims: This report aims to evaluate the Turkish validity and reliability of the Person-Centered Climate Questionnaire-family version (PCQ-F) and contribute to the literature.

Methods: This methodological study included 177 participants who applied to the hospital emergency department (ED). The validated English version of the PCQ-F was translated into Turkish and subsequently translated back into English to assess the alignment between the two versions. Experts then reviewed the Turkish translations, making necessary semantic and grammatical adjustments to finalize the Turkish version. Confirmatory factor analysis was employed to evaluate construct validity. The factorability was evaluated using the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity. The reliability of the Split Half method was assessed using the Spearman-Brown and Gutman coefficients, alongside the calculation of Cronbach's alpha. Additionally, the Item Discrimination Index was evaluated using Mann-Whitney U test.

Results: The confirmatory factor analysis indicated the presence of three distinct factors within the scale. The Split Half reliability results were found to be 0.980 and 0.976. The internal consistency analysis was determined to be 0.940 and 0.988 based on Cronbach's alpha. The presence of floor and ceiling effects was deemed absent.

Conclusion: The analysis of the PCQ-F Turkish version showed that this is a valid and reliable. The PCQ-F serves as a tool for evaluating the perceived psychosocial environment within healthcare, and can also assess the similarities and differences in experiences between families and patients across various healthcare contexts.

Keywords: Climate, family, person-centered care, psychometrics, questionnaire

INTRODUCTION

Patient- and family-centered care represents a model for the organization, provision, and assessment of health care services that emphasizes collaborative relationships among health care providers, patients, and their families.[1] This approach has been associated with improved health outcomes, enhanced experiences for patients and families, increased satisfaction among clinicians and staff, and more efficient use of resources.[1,2]

Disease management is a multifaceted process occurring across diverse environments, including homes, hospitals, and communities. In all these contexts, the involvement of family is crucial, as it can significantly impact family dynamics. The presence of illness extends beyond the individual, often resulting in alterations to the entire family's lifestyle. Family members frequently assume roles that encompass both physical and emotional support, such as preparing meals, administering medications, facilitating physical activity, and assisting with emotional resilience, all aimed at aiding the patient's recovery and illness management.[3]

Trends towards family-centered care in medicine have increased over the last decade, and there has been an increasing recognition of the significant role that patient families have in clinical practice. In the literature, there is an increasing number of studies emphasizing the importance of family functioning in all age groups, from newborns and infants who need intensive care treatment, to elderly people who need medical and social support due to various chronic diseases and increased frailty, or people with various chronic diseases such as spinal cord injury, cancer, heart and kidney failure, or mental illnesses.[4-8]

Family members frequently play a crucial role for patients, particularly in instances of acute or critical illness. From a holistic perspective that encompasses biological, psychological, and social dimensions, families serve as vital resources for both patients and healthcare providers. Rather than viewing them as passive recipients, engaging patients and their families as active participants in decisions regarding follow-up, treatment, or care can enhance health outcomes

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and elevate satisfaction levels for both patients and their families.[9] In order to ensure the best communication and cooperation between healthcare professionals and patients' relatives, methods have been researched and scales have been tried to be put forward.[9,10] To evaluate experiences within the healthcare environment, two distinct scales were developed, one targeting patients (PCQ-P)[11] and the other focusing on staff (PCQ-S).[12] These scales were initially Swedish and were designed, assessed, and validated. A family version of the PCQ (PCQ-F) was then developed to determine the extent whereby individuals within the family assessed the care environment.[9] The PCQ-P has three sub-dimensions to measure the experience of safety, everyday life and hospitality. A safe environment is established when personnel are approachable, demonstrate proficiency, and communicate in clear, comprehensible language. Additionally, maintaining cleanliness and providing areas that allow for both privacy and social interaction are crucial components of this environment. When positive distractions are provided in an environment where patients and their families can feel comfortable and think about things other than the disease and treatment, a daily living environment is provided. A hospitable atmosphere is established when the surroundings communicate that individuals' needs are fulfilled, alongside an impression of care and attention that surpasses anticipated standards.[11,12] PCQ-F addressed the previously unexamined aspect of evaluating family members' perceptions of the care environment in terms of person-centeredness.[9]

In Turkiye, there is a lack of instruments to measure how family members view the caring environment in terms of person-centeredness. As a result of the aforementioned considerations, this research endeavor was meticulously designed with the primary objective of evaluating both the validity and reliability of the PCQ-F instrument specifically within the unique socio-cultural and psychological context of Turkiye, while simultaneously aiming to contribute substantially to the existing body of scholarly literature that addresses this pertinent topic in depth.

METHODS

The Process of Translation and the Subsequent Adaptation to Cultural Contexts

The researchers responsible for the development of the PCQ-F survey were contacted through email to obtain necessary permissions for utilizing the scales in this study. Prior to conducting the validity and reliability assessment, approval was secured from the Ankara University Faculty of Medicine Clinical Researches Ethics Committee (Date: 20.06.2023, Decision No: 106-394-23). This investigation was carried out in compliance with the principles outlined in the Declaration of Helsinki. Each participant furnished written informed consent for the use of their data in the research.

The Turkish adaptation of the PCQ-F was performed by three linguists and two subject matter experts to ensure linguistic validity. Two forward translators worked independently (double-blind) and translated the original PCQ-F into Turkish. The Turkish version was back translated into English by two independent translators and compared to the original

scale. These two independent translators are the independent individuals unfamiliar with the original scale. The PCQ-F was finalized based on the feedback of a Turkish linguist who reviewed the English and Turkish meanings of the scale items.

After the translation process, the scale was first applied to a group of 24 people and the answers to the questions were analyzed to check the comprehensibility and applicability of the questions in the scale. Since the answers were logical and evenly distributed, it was concluded that the scale was applicable to the target group.

Participants and Data Collection

This methodological research involved 177 participants admitted to the emergency department between July 1 and October 31, 2023. Inclusion criteria; being over 18 years of age, having at least literacy level education, volunteering to answer the survey questions presented on the online-tablet. Exclusion criteria: obvious signs of cognitive impairment and/or depression, known to be receiving serious neurological or psychiatric treatment, such as dementia or schizophrenia, vision/hearing problems (reported or perceived).

In validity and reliability studies, having at least 10 times the number of scale items is considered sufficient for the evaluation of the scale.[13] In our study, a minimum sample size of 170 people was found sufficient for 17 questions.

Statistical Analysis

Data analysis was conducted using SPSS 11.5 and AMOS 24.0 software. Descriptive statistics included mean±SD (standard deviation) and median (min-max) for quantitative variables, while qualitative variables were represented by the number of individuals (percentage). The Mann-Whitney U test evaluated statistically significant distinctions between pairs of qualitative variables, while the Kruskal-Wallis H test was utilized for qualitative variables encompassing more than two categories, owing to the infringement of normality assumptions. Construct validity was evaluated through confirmatory factor analysis, with factorability tested using the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity. Reliability was assessed using the Spearman-Brown and Gutman coefficients for Split Half reliability, alongside the calculation of Cronbach's alpha. Additionally, the Mann-Whitney U test was applied to determine the Item Discrimination Index. A p-value that is determined to be lower than the threshold of 0.05 is regarded as indicative of statistical significance, suggesting that the observed results are unlikely to have occurred by random chance alone and thereby warrant further investigation and consideration within the context of the research findings.

RESULTS

Validity

Content validity: Content validity in this research was assessed by 15 experts who classified 17 items using a three-tier rating system: "essential," "useful, but not essential," and "not necessary." The minimum CVR for the group of 15 experts was determined to be 0.49. The CVR is computed using the formula CVR=[E/(N/2)]-1, where E represents the

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number of experts who rated an item as "essential," and N denotes the total number of experts. According to the CVR values presented in **Table 1**, it was determined that all items should remain in the item pool, as the CVR for each item exceeded the threshold of 0.49.

Table 1. CVR and CVI values of items					
Items	Essential	Useful, but not essential	Not necessary	CVR	CVI
I1	15	0	0	1.000	
I2	15	0	0	1.000	
I3	14	1	0	0.867	
I4	13	1	1	0.733	
I5	15	0	0	1.000	
I6	14	1	0	0.867	
I7	15	0	0	1.000	
I8	15	0	0	1.000	
I9	15	0	0	1.000	0.867
I10	15	0	0	1.000	
I11	12	2	1	0.600	
I12	13	1	1	0.733	
I13	14	0	1	0.867	
I14	12	1	2	0.800	
I15	14	1	0	0.867	
I16	13	2	0	0.733	
I17	14	1	0	0.867	
CVR: Content validity ratio, CVI: Content Validity Index					

The CVI for the scale is determined by calculating the average Content Validity Ratio CVR of the items included in the item pool. In this study, the CVI was computed as CVI=(1.000+1.000+0.867+…+0.867)/17=0.867. Since the CVI of 0.813 exceeds the threshold of 0.67, it was concluded that the scale demonstrates statistical significance.

Logical validity: The scale demonstrated logical validity by accurately measuring the key components and delivering the desired information with precision.

Testing of factorability: The KMO test was utilized as a statistical measure to ascertain the appropriateness and adequacy of the sample being analyzed in relation to its suitability for conducting factor analysis. A KMO value that surpasses the threshold of 0.80 is widely recognized as a clear indication of a robust and reliable foundation for performing factor analysis, thereby suggesting that the underlying data structure is indeed conducive to such analytical endeavors. In the context of this particular study, an impressive KMO value of 0.981 was achieved, which serves to definitively confirm that the sample utilized was not only adequate but also remarkably suitable for the intended factor analysis. Moreover, in addition to the KMO test, Bartlett's test of sphericity was meticulously performed in order to rigorously evaluate the adequacy of the correlation matrix for the purposes of factor analysis, which yielded a statistically significant result (p<0.001), thus reinforcing the validity of the correlations observed within the data. This comprehensive assessment highlights

the robustness of the sample and the analytical methods employed, ensuring that the results derived from the factor analysis are both reliable and meaningful. Consequently, the findings of this research are underpinned by a solid methodological foundation, rendering them not only credible but also of substantial value to the broader field of study.

Construct validity: The current study employed confirmatory factor analysis, building on a Turkish validity and reliability assessment of a scale that had previously demonstrated validity and reliability in its original language. **Table 2** presents the factor loadings for the scale's items categorized by subscales, revealing that all items exhibited factor loadings exceeding 0.7, thereby confirming construct validity for the subscales. The Chi-square to degrees of freedom ratio ($\chi2/df$) was determined to be 1.487, which is well below the acceptable threshold of 3 (p<0.001). Additionally, the study reported RFI, CFI, TLI and GFI values of 0.958, 0.988, 0.986 and 0.963 respectively, all surpassing the acceptable benchmark of 0.9. The RMSEA value was calculated at 0.053, which is also below the acceptable limit of 0.08. Overall, the findings affirm the construct validity based on the established criteria.[14] The path diagram for construct validity is given in **Figure**.

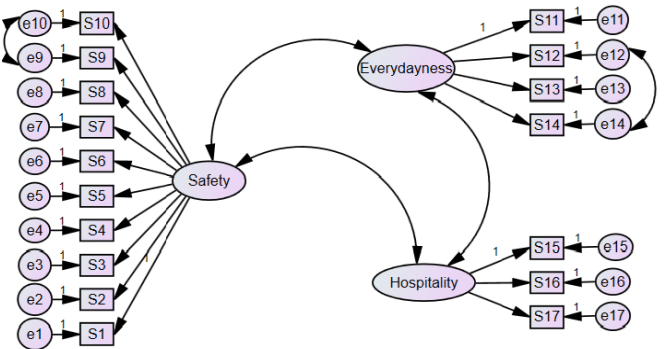| Table 2. Item factor loadings by subscales			
Items	Safety	Everydayness	Hospitality
I1	0.936		
I2	0.927		
I3	0.922		
I4	0.932		
I5	0.908		
I6	0.912		
I7	0.904		
I8	0.926		
I9	0.894		
I10	0.899		
I11		0.915	
I12		0.940	
I13		0.932	
I14		0.946	
I15			0.923
I16			0.893
I17			0.938

Figure. Path diagram of the Person-Centered Climate Questionnaire-family version

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Reliability

Split half reliability: This scheme was used because there was not enough time to re-test the patients and it was difficult to reapply the scale because most of the patients were discharged in a short time. In this method, the items of the scale are divided into two halves and the calculation is based on the correlation between the total scores obtained from these items. The most commonly used Spearman-Brown and Gutman statistics for this method were used in the study. The coefficients for Spearman-Brown and Gutman methods were 0.980 and 0.976, respectively. The results indicated that the scale demonstrated reliability.

Cronbach's alpha: Upon conducting a thorough analysis of the data, the computed values of Cronbach's alpha demonstrated an exceptionally high level of reliability across the various subscales, revealing values that reached an impressive 0.981 for the subscale dedicated to Safety, 0.961 for the subscale pertaining to everydayness, and 0.940 for the subscale associated with hospitality, while the overall total score for the PCQ-F was recorded at an outstanding 0.988. Thus, it can be inferred that both the scale and its respective subscales demonstrate strong internal consistency.

Comparison of top-bottom 27% groups (Item Discrimination Index): A significant difference was observed between the upper and lower 27% groups for the safety, everydayness, and hospitality subscales ($p<0.001$, $p<0.001$, and $p<0.001$), as well as for the overall PCQ-F total score. The analysis determined that the scale possesses a sufficient Item Discrimination Index.

Analysis of ceiling and floor effects within the measurement instrument: The safety subscale in the study had a minimum score of 0 and a maximum score of 50. There were 1 (0.6%) participant who scored 0 and 2 (1.1%) subjects that recorded 50. The everydayness subscale had a minimum score of 0 and a maximum score of 20. Eight (4.5%) participants scored 0, and 4 (2.3%) participants scored 20. The hospitality subscale had a minimum score of 0 and a maximum score of 15. Four (2.3%) participants scored 0, and 7 (4.0%) participants recorded a 15. The entire scale had a minimum score of 0 and a maximum score of 85. One (0.6%) participant scored 0, and 1 (0.6%) participant scored 85. The findings indicate the absence of ceiling or floor effects in both the overall scale and its individual subscales.

Descriptive Statistics

The comprehensive statistical data pertaining to the overarching scale as well as its distinct subscales are meticulously delineated in **Table 3**, which specifically pertains to the cohort of physicians who actively participated in the study. Upon conducting a thorough analysis of the data, it was ascertained that there were no statistically significant variations or discrepancies in the scores obtained from the scale when evaluated across the various examined demographic and clinical variables that were taken into consideration during the research process. This finding underscores the relative uniformity of the scale scores among the participating physicians, suggesting a consistent response pattern that spans the different subgroups analyzed within the study framework.

Table 3. Comparisons of descriptive variables for subscale scores and total score								
Variables		**Safety**		**Everydayness**		**Hospitality**		**PCQ-F score**	
		Mean±SD	Median (min-max)	Mean±SD	Median (min-max)	Mean±SD	Median (min-max)	Mean±SD	Median (min-max)
Age	≤42	22.35±12.39	20.00 (2.00-49.00)	8.07±4.88	7.50 (0.00-20.00)	6.75±3.83	6.50 (0.00-15.00)	37.16±20.63	34.50 (3.00-83.00)
	>42	24.78±13.31	26.00 (0.00-50.00)	9.26±5.53	10.00 (0.00-20.00)	7.45±4.03	8.00 (0.00-15.00)	41.48±22.54	45.00 (0.00-85.00)
	p-value	0.192[a]		0.128[a]		0.228[a]		0.176[a]	
Gender	Female	24.98±13.41	26.00 (0.00-50.00)	9.17±5.43	9.00 (0.00-20.00)	7.51±4.11	8.00 (0.00-15.00)	41.66±22.56	41.00 (0.00-85.00)
	Male	20.86±11.42	19.00 (2.00-48.00)	7.68±4.71	7.00 (0.00-17.00)	6.32±3.50	7.00 (0.00-15.00)	34.86±19.18	33.00 (3.00-80.00)
	p-value	0.063[a]		0.109[a]		0.073[a]		0.068[a]	
Marital status	Single	23.69±12.89	24.00 (2.00-47.00)	8.47±4.78	8.00 (0.00-17.00)	7.09±3.78	7.50 (1.00-15.00)	39.24±21.04	40.00 (3.00-78.00)
	Married	23.40±12.91	24.00 (0.00-50.00)	8.75±5.51	9.00 (0.00-20.00)	7.08±4.05	7.00 (0.00-15.00)	39.23±22.08	40.00 (0.00-85.00)
	p-value	0.842[a]		0.859[a]		0.908[a]		0.945[a]	
Educational status	Elementary	24.29±14.79	25.00 (1.00-50.00)	9.27±6.21	9.00 (0.00-20.00)	7.39±4.39	8.00 (0.00-15.00)	40.95±25.01	41.00 (2.00-85.00)
	High school	26.35±11.52	26.50 (3.00-48.00)	9.83±4.46	9.50 (0.00-20.00)	8.00±3.73	8.00 (0.00-15.00)	44.19±19.35	45.00 (3.00-80.00)
	University	22.18±12.60	18.50 (0.00-48.00)	8.03±5.02	7.00 (0.00-19.00)	6.66±3.85	6.00 (0.00-15.00)	36.87±20.96	32.00 (0.00-81.00)
	Postgraduate	20.23±12.07	21.00 (2.00-50.00)	6.88±4.89	7.00 (0.00-19.00)	5.92±3.50	5.50 (1.00-15.00)	33.04±20.16	34.50 (3.00-84.00)
	p-value	0.073[b]		0.148[b]		0.067[b]		0.110[b]	
Patient's relative before	No	23.02±12.53	21.00 (2.00-49.00)	8.37±4.75	8.00 (0.00-19.00)	7.01±3.82	7.00 (1.00-15.00)	38.40±20.76	37.00 (5.00-83.00)
	Yes	24.01±13.25	25.50 (0.00-50.00)	8.91±5.67	9.00 (0.00-20.00)	7.16±4.06	8.00 (0.00-15.00)	40.08±22.53	41.50 (0.00-85.00)
	p-value	0.571[a]		0.574[a]		0.773[a]		0.590[a]	
SD: Standard deviation, Min: Minimum, Max: Maximum, a: Mann-Whitney U test, b: Kruskal Wallis H test									

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DISCUSSION

The PCQ-F scale offers an innovative approach to examine how family members perceive psychosocial care and the extent to which it is regarded as person-centered. This scale aims to contribute to the literature by providing more information on how various care settings are perceived by family members. Through the scale, knowledge can be increased in the psychosocial context and person-centered care can be developed in relevant areas, taking into account the well-being of all individuals involved in the study. In this research, the assessment of the validity and reliability of the Turkish adaptation of the PCQ-F scale was conducted.

he initial version of the scale represents the sole research in the existing literature that has evaluated its validity and reliability. The original study indicated that construct validity was confirmed through a three-factor structure. Lindahl et al.[9] did not conduct exploratory factor analysis in their study; however, they indicated that a three-factor structure was suitable. In the current research, confirmatory factor analysis was executed based on this three-factor framework, although it was not validated. Evaluation was made based on the total score of 17 questions and the single-factor structure was provided by confirmatory factor analysis.

In evaluations, a scale is deemed more dependable when its Cronbach's alpha approaches 1. The initial research on the scale revealed Cronbach's alphas of 0.95 for the safety subscale, 0.88 for the everydayness subscale, and 0.75 for the hospitality subscale.[9] In the current investigation, the Cronbach's alpha for the PCQ-F total score was determined to be 0.988. Additionally, the test-retest (split half reliability) correlation coefficients for the PCQ-F total score were recorded at 0.980 and 0.976 using two different methods. These findings suggest that the scale demonstrates a high level of reliability for use.

Limitations

The study's limitation lies in the fact that the scale was administered to relatives of patients within the high-stress context of an emergency room. Because in such an environment, people tend to complete the scale by answering quickly without reading. The limitation was addressed by incorporating a control question into the survey, aimed at discouraging random responses from participants. Those who failed to select the appropriate response to the control question, which asked them to indicate that they had read and understood the instructions, were excluded from the study. As a result, 17 people were removed from the study. The study was completed using the data of the remaining people, thus creating a more reliable study.

CONCLUSION

The findings from the study indicate that the Turkish adaptation of the PCQ-F is both valid and reliable. This instrument can effectively evaluate perceptions of the psychosocial climate within healthcare environments and its potential impact on outcomes. Additionally, it serves to analyze the similarities and differences in experiences between families and patients across various healthcare contexts.

ETHICAL DECLARATIONS

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