Patient Preference and Adherence

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METHODOLOGY

Validation of the Korean Version of Patient-Centered Care Tool: For Outpatients

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Aim: The objective of this study was to assess the validity and reliability of the Korean version of the patient-centered care (K-PCC) instrument for outpatients. The study was conducted due to the absence of a measurement tool specifically designed to evaluate patient-centered care for outpatients.

Design: This study is a methodological study to verify the validity and reliability of the Korean version of Patient-Centered Care (K-PCC) to measure patient-centeredness for outpatients.

Methods: As a first step for the evaluation of the tool, the content validity was verified by expert panel. Then, a total of 400 outpatients were recruited, and construct validity was verified through confirmatory factor analysis (CFA) as the second step for the evaluation of the tool. The convergent and discriminant validity of the tool was verified by calculating the standardized factor loads, construct reliability (CR), and average variance extracted (AVE), and calculating the correlation square between the factors as the third and fourth steps for the evaluation of the tool. And as a fifth step for the evaluation of the tool, criterion validity was evaluated by comparing the correlation with the patient-centeredness measurement tool for inpatients (PEx-inpatient). In estimating reliability, internal consistency reliability coefficients were calculated.

Results: The confirmatory factor analysis supported good fit for the Korean patient-centered care instrument (K-PCC), and the eight-factor structure was validated. The scale comprises 21 items across eight factors: patient preferences (4 items), physical comfort (2 items), coordination of care (2 items), continuity and transition (3 items), emotional support (2 items), access to medical care (3 items), information and education (2 items), and family and friends (3 items). The Cronbach's alphas ranging between 0.73 and 0.88.

Conclusion: The Korean patient-centered primary care instrument is a valid and reliable scale to measure patient-centered care for outpatients in the Korean medical environment.

Keywords: instrumentation, factor analysis, statistical, patient-centered care, patient experience

Introduction

In 2001, the Institute of Medicine (IOM) announced six key elements as requirements for quality healthcare.[1] Among the six key elements, patient-centeredness is a concept that establishes a shared relationship between healthcare providers, patients, and their families to respect patient preferences in the decision-making process and ensure they receive the education and support they need to participate in their care.[1] Patient-centeredness is an intangible value, which makes it challenging to define and measure the concept. Furthermore, it presents a limitation as it is not readily captured by existing administrative data.[2] Nevertheless, in the United States and the United Kingdom, patient-centeredness has been measured since the early 2000s, reflected in the evaluation of the quality of care, and compensated through a value-based payment systems. Patient-centeredness, based on respect and partnership between patients and service providers, nurses and other clinical staff, is at the heart of quality primary care and is associated with positive health outcomes.[3] Patient-centeredness in interactions between patients and medical staff is considered to lead to positive results by increasing patient trust in medical staff and facilitating shared decision-making,[4] and is an essential competency for medical staff.[5–7]

In 2012, the Organization for Economic Cooperation and Development (OECD) recommended the need to establish the patient experience evaluation system in South Korea through the "OECD Health Care Quality Review" report,[8] and

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the 2015 parliamentary audit also pointed out the need for efforts to do so.[9] With this as an opportunity, the Health Insurance Review and Assessment Service conducted a study on the "patient-centered evaluation model" for inpatients and developed an evaluation tool,[10] and the first evaluation began in 2017 and is set for the fourth evaluation in 2023.[11] In the case of South Korea, although medicine has made rapid progress, consideration of patient-centeredness is insufficient in that patient-centeredness is considered as an characteristics and personalities of individual doctors rather than competency of medical institutions.[2] The Korean Medical Association has highlighted certain concerns regarding patient experience evaluation, stating, "Since individual preferences, needs, and values vary based on personal inclinations and criteria for judgment, the results may differ even after receiving the same service".[12] Furthermore, they oppose the implementation of patient experience evaluation, asserting that the ranking of medical institutions based on evaluation scores lacks objectivity and reliability. They argue that the evaluation items are subjective and that the Health Insurance Review and Assessment Service seeks to exert control over medical institutions under the guise of institutional improvement.[13] Conversely, medical consumer groups argue that some form of hospital evaluation should be conducted as South Korea's healthcare system still primarily revolves around healthcare providers.[13] Korea has the highest ratio of the average number of outpatient treatments per doctor in any OECD country, and doctors see the average 14.6 outpatients per day which is twice the OECD average of 6.8. Accordingly, patients have been found to have negative experiences of waiting for a long time and receiving short treatments during outpatient treatment.[2] According to the OECD's comparison of healthcare quality among member countries, disease management in Korea is lower quality for chronic compared with acute diseases.[2,14] Although there is continued opposition to the patient experience evaluation by the opening doctors, given that patients with chronic diseases require frequent outpatient treatment, a tool needs to be developed that can measure the patient-centeredness outpatients experience in the Korean medical environment. In medical technology evaluation, the participation of patients and citizens themselves helps to secure procedural legitimacy by strengthening stakeholder participation and improving transparency. In addition, it is urgent to develop a patient experience evaluation tool for outpatients from a positive perspective that provides a specific and practical basis for treatment experience and quality of life.[15]

As a result of reviewing the literature, similar tools have recently been developed to measure patient-centeredness in South Korea, such as the Patient-Centered Healthcare Services Evaluation Scale,[16] Patient-Centered Nursing Culture Scale for Hospitals[17] and the Korean version of Person-centered Practice Inventory-Staff for nurses.[18] However, these instruments cannot be regarded as tools that reflect patient preferences, which are the basis of patient-centeredness. The Person-centered Care Assessment (P-CAT), a human-centered care measurement tool, has also been developed by modifying tools created abroad; however, it has limitations in measuring the patient-centeredness of outpatient care, because it was developed for older adults with dementia, families, and nursing providers in elder care facilities. In addition, a survey was conducted in Korea on patient satisfaction with medical institutions; however, questions were raised about the validity, as various measurement tools were used.[10] Thus, research and tools for measuring patient-centeredness for outpatients are still in their early stages in Korea, a standardized Korean version of patient-centered medical measurement tools need to be developed that can assess properties of patient-centeredness based on theoretical grounds.

Research on tool development has been more active abroad than in Korea,[19] such as the Individualized Care Instrument (ICI), Patient-centered Family-focused Care (PCFC), Person-centered health care for older adults (PCHC), P-CAT, and Person-directed care assessment tool (PDC).[19] However, since many of the developed tools are used in combination without separating inpatients and outpatients, there is a limit to reflecting the experience of outpatients in Korea, where outpatient treatment hours are generally less than 5 minutes.

The Patient-Centered Primary Care instrument (PCPC), developed in the Netherlands in collaboration with Harvard University and the Picker Institute, is a tool that has been verified for reliability and validity by applying the Patient-Centered Care (PCC) tool to the primary care environment.[20] The PCC is one of the three most influential models in the United States that form the basis for patient-centered care,[21] and its benefits have been demonstrated through several studies[22–28] and measured in patients to reflect their values and preferences. Therefore, the PCPC tool based on PCC needs to be evaluated and applied after being modified to suit the Korean medical environment, where tools for measuring patient-centeredness for outpatients are lacking.

Methods

Aim

This study aimed to verify the validity and reliability of the Korean version of the PCPC, a patient-centered medical measurement tool developed by Cramm and Nieboer.[20]

Research Design

This study is a methodological study to verify the validity and reliability of the Korean version of the PCPC to measure patient-centered medical care in primary care settings.

Participants

The participants in this study were aged 19 years or older, receiving outpatient treatment at university hospitals, and able to communicate by reading and writing. Foreign, psychiatric, and pediatric patients were excluded from the study. For confirmatory factor analysis, the sample size should be at least ten times the number of questions,[29] and the number of participants should be at least 360 participants. Therefore, the number of participants necessary for this study was calculated at 420, considering a 15% dropout rate. Excluding 20 collected questionnaires, including those with insufficient responses, 400 completed questionnaires were included in the final analysis.

Instrument

The PCPC was developed by Cramm and Nieboer[20] to measure patient-centered care for primary care patients in eight dimensions, based on the concept of patient-centeredness identified by the Picker Institute. The PCPC consists of 36 items across eight dimensions, including patient preferences (7 items), physical comfort (5 items), coordination of care (4 items), continuity and transition (4 items), emotional support (4 items), access to care (5 items), information and education (4 items), and family and friends (3 items). The PCPC is measured on a five-point Likert scale (1 = totally disagree, 5 = totally agree). The higher the average score, the more patient-centered medical care is considered to have been provided. Regarding reliability at the time of development, Cronbach's α of the eight dimensions ranged from 0.72 to 0.92 and was 0.89 for the entire scale.

Research Process

The process of this study was shown in Figure 1. In Item construction stage, the translation and back-translation process was conducted and the content validity was verified. The researchers used a CVI (Content Validity Index) cut-off of 0.8 to verify the content validity of the study. In pilot study stage, a preliminary survey was conducted with 10 outpatients. Based on the pilot study results, modifications were made to the PCPC questionnaire. In main study stage, data collection was conducted with 400 outpatient patients, and based on the results, the construct validity, criterion validity, and reliability of PCPC were verified. The factor loading cut-off was 0.6. The convergent and discriminant validity of the questionnaire were verified by calculating the standardized factor loadings, construct reliability (CR), and average variance extracted (AVE). CR should be greater than or equal to 0.70 and less than or equal to 0.95, and the AVE should be greater than or equal to 0.50.[30] In reliability the Cronbach's α 0.7 was the cut-off value.

Item Construction Stage

Translation and Back-Translation of PCPC

The translation process was conducted in accordance with the linguistic validation process recommended by the Mapi Research Trust[31] after obtaining approval for the tool's translation and use from the PCPC's developer.[20] The linguistic validity process has four phases through which the translated tool is conceptually equivalent to the original tool when translated into another language and is consistent with the cultural context and easy for users to understand. In Phase 1 (forward translation), two researchers fluent in both Korean and English independently translated the PCPC. Subsequently, the researchers asked the professional translator, who was fluent in Korean and English and had a master's degree in English literature, to faithfully translate the PCPC based on the original interpretation after explaining the tool's purpose. Version 1 was created after comparing the consistency between the tools translated by the researcher and that of translated by the translator.

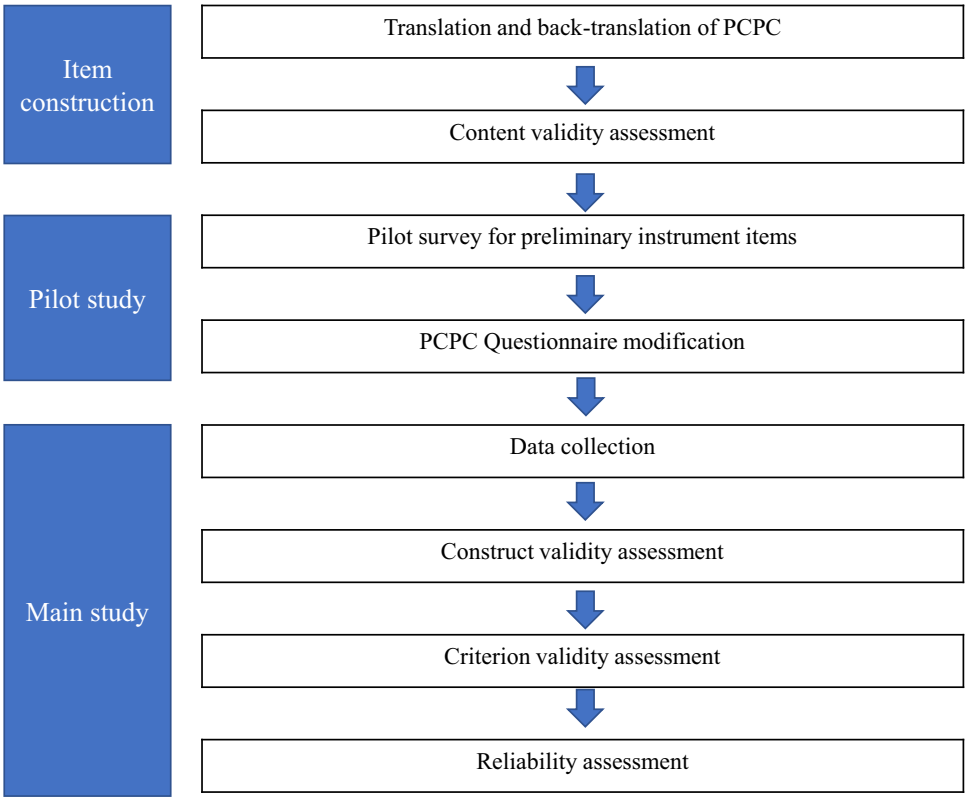

Figure 1 The process of the study.

Version 1 was verified by a panel of eight experts, including two nursing professors, three senior nurses, one head nurse in an integrated nursing care unit who provides direct care, and two head nurses in the general ward.

In Phase 2 (backward translation), version 2 was created by comparing the content with revised version 1 after requesting a foreign professional translator who was fluent in Korean and was not familiar with the original PCPC.

In Phase 3 (patient testing) was conducted to check whether the revised version 2 was suitable and comprehensible for outpatients, who were the PCPC's intended respondents. A preliminary survey was conducted with 10 outpatients to determine whether there were any difficulties in understanding the survey's content.

In Phase 4 (proofreading), the first version of the tool with 28 items was confirmed after checking for spelling and grammatical errors with a Korean literature scholar.

Content Validity

The version 1 PCPC was created after comparing the consistency between the tools translated by the researcher and that of translated by the translator. Version 1 was verified by a panel of eight experts, including two nursing professors, three senior nurses, one head nurse in an integrated nursing care unit who provides direct care, and two head nurses in the general ward. Tests showed that the CVI was 0.75 for three items, including Items 23 ("I was made aware of the possibilities for more intensive emotional support"), 32 ("I had easy access to my own data (lab results, medication overview, and referrals)"), and 34 ("With my consent, relatives were involved in my treatment"); however, the total CVI was 0.94. As a result of a discussion on items that did not meet the standard CVI value of 0.8, some items were removed or changed to create a revised version 1. For Item 23, the meaning of the phrase 'more intensive emotional support' was ambiguous, and Item 32 was found to be inadequate in Korea's outpatient environment; thus, both items were excluded. For Item 34, "relatives" was revised to "family and guardians", because in Korea, family members mainly makes decisions based on family-centeredness.[32]

The version 2 PCPC was created by comparing the content with revised Version 1 after requesting a foreign professional translator who was fluent in Korean and was not familiar with the original PCC. In this process, four items (4,16, 24, 33) were

found to have overlapping meanings due to cultural differences. Specifically, Items 4 ("The influence of treatment that may have upon my life was taken into account") and 24 ("There was a concern for the influence of my health upon my daily life (family, relative, work, social life, etc.)") and Items 16 ("I could easily contact someone with questions") and 33 ("I could ask questions whenever I wanted") were interpreted as having the same meaning to respondent. After discussions between the researchers, Items 4 and 16 were deleted. As a result of reviewing these overlapping items, a revised version 2 was created, and a second content validity verification was conducted on two nursing professors, two head nurses, and one senior nurse. The total CVI was 0.97, and the CVI of items 15 and 33 were less than that of CVI 0.80. Items 15 ("I knew who was adjusting my treatment") and 33 ("I could ask questions whenever I wanted") were deleted.

Pilot Study and Questionnaire Modification

Pilot study was conducted to check whether the revised version 2 was suitable and comprehensible for outpatients, who were the PCPC's intended respondents. A preliminary survey was conducted with 10 outpatients to determine whether there were any difficulties in understanding the survey's content. As a result of examining the validity of the revised items, Item 5 ("I was helped to determine my own treatment purpose") and 6 and Item 17 ("I knew where and why I should go when being referred to other healthcare providers (expert/nutritionist/physical therapist)") and 18 ("All my information was delivered accurately in the case of a request and forwarding") were considered to mean the same thing to respondents. After discussion between two researchers, Items 5 and 18 were deleted.

Main Study

Data Collection

The study period was from November 16, 2022 to January 3, 2023. Data were collected using face-to-face and non-face-to-face methods, and 400 questionnaires were collected in total. In the sampling process, convenience sampling was employed. Face-to-face data were collected with written consent from those who agreed to participate after receiving an explanation of the purpose of the study. These participants were patients who were waiting for or had completed outpatient treatment at a university-affiliated hospital in Gyeonggi Province, South Korea. Non-face-to-face data collection was performed using an online questionnaire platform to present the study's purpose and procedure, participation method, consent to provide information, and questionnaire content. Data were then collected by obtaining approval from four online communities frequently used by outpatients and posting online addresses for surveys, along with recruitment posters for research participants. Respondents who participated in the study in a non-face-to-face manner read the explanation and participated in the survey and could withdraw from the study at any time. All participants received a reward.

Data Analysis

The collected data were analyzed using IBM SPSS 25.0 and AMOS 23.0. The participants' demographic and sociological characteristics were analyzed by frequency and percentage, mean, and standard deviation. Item analysis, which identifies the item-domain correlation of each item, was conducted to confirm the contribution of each item to the concept.

Construct Validity

The original PCPC has already been verified for construct validity thus confirmatory factor analysis is appropriate for verifying the relationships between items and factors by applying previously verified tools to other population groups.[33] Therefore, in this study, a confirmatory factor analysis was conducted to verify the construct validity of the Korean version of the PCPC. An absolute fit index was used to evaluate the overall model fit, a relative fit index was used to evaluate the differences between the model and the actual data, and a parsimonious fit index was used to evaluates the model's complexity. The absolute fit index was confirmed using the chi-squared test, root mean square error of approximation (RMSEA), and adjusted goodness of fit index (AGFI). The chi-squared test is an indicator of a model's suitability under the assumption of normal distribution; the model is suitable only when the *p*-value is greater than 0.05, but model fit is not necessarily low even if the *p*-value is less than 0.05. To compensate for this, the chi-squared statistic divided by the degree of freedom (normed chi-square [NC]) is less than or equal to 3.0, which is considered appropriate. RMSEA 0.05~.10 is considered an appropriate model.[29,30] The AGFI is a value adjusted by the degree of freedom and is considered to indicate very good model if it is greater than or equal to 0.90.

The relative fit index (normal fit index [NFI]) and comparative fit index [CFI]) were confirmed, as was the brief fit index (Akaike information criterion [AIC]). The NFI and CFI are also considered very good if they are 0.90 or higher, and are evaluated as an appropriate level if they are between 0.70 to 0.90. For the AIC, the complexity of the model increases as the value increases; therefore, the lower the value, the better the model.

The convergent and discriminant validity of the questionnaire were verified by calculating the standardized factor loadings, construct reliability (CR), and average variance extracted (AVE), and calculating the correlation square between the factors.

Criterion Validity

The criterion validity verification of the Korean version of the PCPC confirmed the correlations between the patient-centeredness measurement tool for inpatients (PEx-inpatient) developed by the Health Insurance Review and Assessment Service.[11]

Reliability Assessment

The reliability of the tool was determined using Cronbach's α, confirming internal consistency.

Results

Participants Characteristics

Demographic characteristics of the participants are presented in Table 1. The mean age of the participants in this study was 40 ± 15.1; 57.0% of those under the age of 40 years, and 43.0% were over. Of these, 78.8% were women, 47.8% were married, 62.0% were revisiting outpatients, and 51.0% had a bachelor's degree.

Item Analysis

As a result of the item analysis of the Korean version of the PCPC with 28 items, the mean of each item was distributed between 2.88 and 4.21, and the standard deviation was in the range of 0.75 to 1.20. The Item 29 ("I can easily request a receipt") was the highest with 4.21 points, and Item 28 ("I did not have to wait long for my turn when I visited") was the lowest with 2.88 points. The skewness ranged from −1.12 to 0.04 and the kurtosis ranged from −1.06 to 0.98; thus, the normality test was satisfied with skewness below 3 and kurtosis below 10. As a result of confirming the correlation coefficient between the items and factors, Factor 1 (patient preferences) was 0.69~.82, Factor 2 (physical comfort) was

Table 1 General Characteristics of the Participants (*N*=400)

Characteristics	Categories	n (%)	M±SD
Age (yr)	< 40 ≥ 40	228 (57.0) 172 (43.0)	40±15.1
Gender	Male Female	85 (21.3) 315 (78.8)	
Marital status	Married Unmarried Divorced Widowed	191 (47.8) 178 (44.5) 15 (3.8) 16 (4.0)	
Type of visit	First visit Revisit	152 (38.0) 248 (62.0)	
Educational level	High school or and lower College Graduate school or higher	102 (25.6) 204 (51.0) 94 (23.5)	
Department of Medical	Internal medicine Surgical medicine Other medicine	192 (48.0) 124 (31.0) 84 (21.0)	

Abbreviations: M, Mean; SD, Standard deviation.

0.64~.74, Factor 3 (coordination of care) was 0.86~.92, Factor 4 (continuity and transition) was 0.81~.86, Factor 5 (emotional support) was .73~.90, Factor 6 (access to care) was 0.60~.80, Factor 7 (information and education) was 0.89~.91, and Factor 8 (family and friends) was 0.81~.87 (Table 2).

Table 2 Item Analyses of the Korean Version of the PCC (28 Items) (*N*=400)

Item no.	M±SD	Skewness	Kurtosis	Domain								Cronbach's α
				F1	F2	F3	F4	F5	F6	F7	F8	
Patients' preferences (Factor 1)												0.79
1	3.51±0.90	−0.41	0.12	0.73	0.55	0.38	0.44	0.51	0.50	0.37	0.24	
2	3.58±0.91	−0.36	−0.36	0.82	0.51	0.45	0.41	0.45	0.44	0.46	0.17	
3	3.60±1.04	−0.65	−0.06	0.76	0.43	0.38	0.35	0.39	0.36	0.34	0.18	
5	3.78±0.78	−0.61	0.70	0.74	0.47	0.37	0.44	0.46	0.34	0.38	0.23	
7	3.81±0.87	−0.63	0.33	0.69	0.48	0.38	0.39	0.50	0.37	0.38	0.17	
Physical comfort (Factor 2)												0.74
8	3.86±0.91	−0.52	−0.22	0.56	0.64	0.36	0.46	0.55	0.42	0.28	0.13	
9	3.50±0.99	−0.28	−0.54	0.49	0.69	0.31	0.42	0.61	0.38	0.19	0.16	
10	3.94±0.87	−0.57	−0.18	0.40	0.73	0.38	0.38	0.31	0.32	0.39	0.22	
11	3.57±0.99	−0.37	−0.52	0.38	0.74	0.40	0.30	0.32	0.39	0.42	0.28	
12	3.75±0.98	−0.41	−0.50	0.43	0.68	0.62	0.38	0.38	0.35	0.41	0.27	
Coordination of care (Factor 3)												0.73
13	3.50±0.96	−0.45	−0.36	0.44	0.49	0.92	0.44	0.36	0.38	0.40	0.36	
14	3.75±0.75	−0.31	−0.09	0.50	0.58	0.86	0.46	0.43	0.38	0.43	0.28	
Continuity and transition (Factor 4)												0.79
17	3.89±0.83	−0.54	0.01	0.44	0.48	0.43	0.81	0.43	0.40	0.40	0.30	
19	3.92±0.78	−0.50	0.07	0.44	0.46	0.43	0.85	0.35	0.35	0.36	0.27	
20	3.91±0.76	−0.52	0.19	0.47	0.47	0.39	0.86	0.42	0.39	0.37	0.28	
Emotional support (Factor 5)												0.79
21	3.48±1.01	−0.28	−0.51	0.54	0.54	0.35	0.44	0.88	0.42	0.35	0.24	
22	3.39±1.08	−0.31	−0.57	0.51	0.55	0.32	0.37	0.90	0.44	0.31	0.22	
24	3.38±0.99	−0.36	−0.39	0.49	0.47	0.43	0.40	0.73	0.34	0.32	0.37	
Access to care (Factor 6)												0.77
25	3.75±1.00	−0.74	0.08	0.37	0.35	0.33	0.30	0.33	0.72	0.41	0.15	
26	3.63±1.03	−0.52	−0.32	0.42	0.41	0.30	0.37	0.39	0.80	0.39	0.16	
27	3.63±1.07	−0.53	−0.49	0.40	0.45	0.31	0.33	0.36	0.79	0.34	0.17	
28	2.88±1.20	0.04	−1.06	0.41	0.36	0.28	0.28	0.47	0.70	0.21	0.12	
29	4.21±0.90	−1.12	0.98	0.33	0.36	0.31	0.39	0.12	0.60	0.41	0.11	
Information and education (Factor 7)												0.77
30	3.89±0.87	−0.67	0.40	0.52	0.47	0.42	0.44	0.36	0.49	0.91	0.31	
31	3.73±0.82	−0.27	−0.27	0.40	0.40	0.41	0.37	0.34	0.36	0.89	0.40	
Family and friends (Factor 8)												0.78
34	3.45±0.97	−0.27	−0.28	0.19	0.26	0.31	0.26	0.24	0.15	0.28	0.81	
35	3.55±0.93	−0.43	0.04	0.38	0.37	0.34	0.37	0.43	0.33	0.37	0.84	
36	3.26±1.12	−0.26	−0.76	0.11	0.16	0.27	0.23	0.18	0.05	0.33	0.87	

Abbreviations: PCC, Patient-centered care; M, mean; SD, standard deviation; F, factor.

Validity and Reliability of the Korean Version of the PCPC

Validity

Content validity

An item analysis was conducted before the confirmatory factor analysis. As a result of confirming the correlation coefficient between the items and subfactors for the item-level content validity (item-level content validity index [I-CVI]), items with an I-CVI value of 0.70 or higher were selected. Five items (Items 7, 8, 9, 12, and 29) had an I-CVI value of less than 0.70, and three were considered necessary, while two were deleted. The two deleted question were Item 7 ("I was advised on what I could actually do"; I-CVI = 0.69) and Item 29 ("I could easily request a receipt"; I-CVI = 0.60). Item 29 could be interpreted as inappropriate for the Korean medical environment where receipts are provided after treatment without the need for a separate request. In addition, Item 7 was interpreted as inappropriate in the Korean medical environment. This can be interpreted from the perspective of the outpatient medical environment in South Korea, where a large number of patients are seen within a short period of time. The number of outpatient visits per physician per day in South Korea is twice the average of OECD countries,[2] resulting in patients receiving services within a time frame of 5 minutes.[34] As a result, patients utilize medical services under the guidance of healthcare professionals, and there is limited time available for seeking advice. As a result of confirming the item-level content validity, a correlation of moderate or higher was generally accepted, and finally, 26 items were extracted for the second version of the tool.

Construct Validity

The results of the confirmatory factor analysis to test the construct validity of the Korean version of the PCPC with 26 items are shown in Table 3. As a result of analyzing the suitability of the confirmatory factor analysis of the Korean version of the PCPC, the chi-squared statistic was 1052.38 (df =271, p <0.001), and NC was 3.88. However, with RMSEA = 0.09, AGFI = 0.77, NFI = 0.79, and CFI = 0.84, the AGFI values were found to not meet the recommended criteria.

Accordingly, to increase the model fit, the standardized coefficients of Items 10, 11, 12, 24, and 28 with low explanatory power and a factor loading below 0.60, were removed. We compared and analyzed the suitability of Model 1 including all 26 items and Model 2 with Items 10, 11, 12, 24, and 28, with a factor load of less than 0.60, removed.

Regarding the results of Model 2 with 21 items, the chi-squared static was 386.18 (df =161, p < 0.001); however, NC was 2.40, which met the standard of NC < 3.0; NFI = 0.90, CFI = 0.94, and RMSEA=0.06 showed a significant increase over Model 1 to a suitable level, the AGFI also met the recommended criteria with a suitable level of 0.88, and the simple name suitability index, AIC, decreased from 1212.38 to 526.18, making the model more parsimonious (Table 3). The significance (CR) value was 11.20-19.88 in the relationships with each factor of Model 2, which removed five items from Model 1, and all factors were significantly explained from the constituent variables based on a significance level of 0.05. Thus, the Korean version of the PCPC (hereinafter K-PCC) with 21 items was adopted as the final tool (Table 4).

Convergent and Discriminant Validity

The results of verifying the convergent validity of the K-PCC with 21 items finally adopted through confirmatory factor analysis are shown in Table 4. To verify the convergent validity, the standardized factor load (β) should be greater than or equal to 0.60, the CR should be greater than or equal to 0.70 and less than or equal to 0.95, and the AVE should be greater than or equal to 0.50.[35] The results of this study verified the convergent validity of the K- PCC, because the β value of all items was 0.65~.89, CR was 0.77~.88, and AVE was 0.53~.78. The results of verifying the discriminant validity of the K-PCC with 21 through confirmatory factor analysis are shown in Table 4. Discriminant validity was

Table 3 Model Fit of the Korean Version of the PCC (*N*=400)

Model	Absolute Fit Index				Relative Fit Index		Parsimonious Fit Index
	χ^2 (*p*)	χ^2 (*p*)/df	RMSEA	AGFI	NFI	CFI	AIC
Model 1 (26 items)	1052.38 (<.001)	3.88	0.09	0.77	0.79	0.84	1212.38
Model 2 (21 items)	386.18 (<.001)	2.40	0.06	0.88	0.90	0.94	526.18

Abbreviations: PCC, Patient-centered care; df, Degrees of freedom; RMSEA, Root mean square error of approximation; AGFI, Adjusted goodness of fit index; NFI, Normed fit index; CFI, Comparative fit index; AIC, Akaike information criterion.

Table 4 Results of the CFA and Analyses of Discriminant Validity of the Korean Version of PCC (21 Items) (*N*=400)

Factors	Item no.	Nonstandardized Estimates (B)	Standardized Estimates (β)	SE	C.R	*p*	M±SD	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	AVE	CR
								r (R^2)	r (R^2)	r (R^2)	r (R^2)	r (R^2)	r (R^2)	r (R^2)	r (R^2)		
Factor 1	1	1.00	0.68	–	–	–	3.62±0.71	–	0.69 (0.47)	0.66 (0.43)	0.63 (0.49)	0.60 (0.36)	0.57 (0.32)	0.64 (0.41)	0.36 (0.13)	0.54	0.82
	2	1.19	0.80	0.09	13.25	<0.001											
	3	1.11	0.65	0.10	11.34	<0.001											
	5	0.86	0.67	0.07	11.62	<0.001											
Factor 2	8	1.00	0.79	–	–	–	3.68±0.85	0.69 (0.47)	–	0.50 (0.25)	0.62 (0.38)	0.75 (0.57)	0.50 (0.25)	0.36 (0.13)	0.25 (0.06)	0.63	0.77
	9	1.06	0.77	0.08	14.09	<0.001											
Factor 3	13	1.00	0.76	–	–	–	3.63±0.76	0.66 (0.43)	0.50 (0.25)	–	0.63 (0.40)	0.45 (0.20)	0.46 (0.21)	0.56 (0.31)	0.42 (0.18)	0.66	0.80
	14	0.80	0.78	0.07	12.21	<0.001											
Factor 4	17	1.00	0.67	–	–	–	3.90±0.66	0.63 (0.49)	0.62 (0.38)	0.63 (0.40)	–	0.48 (0.23)	0.49 (0.24)	0.56 (0.31)	0.42 (0.18)	0.68	0.86
	19	1.10	0.79	0.09	12.80	<0.001											
	20	1.09	0.80	0.09	12.90	<0.001											
Factor 5	21	1.00	0.89	–	–	–	3.43±0.99	0.51 (0.46)	0.75 (0.57)	0.45 (0.20)	0.48 (0.23)	–	0.50 (0.25)	0.42 (0.18)	0.32 (0.10)	0.78	0.88
	22	1.07	0.89	0.05	19.88	<0.001											
Factor 6	25	1.00	0.66	–	–	–	3.67±0.85	0.57 (0.32)	0.50 (0.25)	0.46 (0.21)	0.49 (0.24)	0.50 (0.25)	–	0.58 (0.33)	0.27 (0.07)	0.53	0.77
	26	1.32	0.85	0.11	12.33	<0.001											
	27	1.10	0.68	0.10	11.20	<0.001											
Factor 7	30	1.00	0.82	–	–	–	3.81±0.76	0.64 (0.41)	0.36 (0.13)	0.56 (0.31)	0.56 (0.31)	0.42 (0.18)	0.58 (0.33)	–	0.50 (0.25)	0.70	0.82
	31	0.88	0.76	0.07	13.21	<0.001											
Factor 8	34	1.00	0.67	–	–	–	3.42±0.85	0.36 (0.13)	0.25 (0.06)	0.42 (0.18)	0.42 (0.18)	0.32 (0.10)	0.27 (0.07)	0.50 (0.25)	–	0.55	0.78
	35	1.16	0.81	0.10	11.99	<0.001											
	36	1.30	0.75	0.11	11.76	<0.001											

Abbreviations: PCC, Patient-centered care; SE, Standard error; C.R, Critical Ratio; M, Mean; SD, Standard deviation; AVE, Average variance extracted; CR, Construct reliability; R^2, Correlation coefficient$^{2.}$

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verified when the two subfactors (AVE values were all larger than the square (R^2) of the correlation coefficient (r) between factors.[35] As shown in Table 4, the discriminant validity was verified, in that the value of AVE was larger than the square of the correlation coefficient.

Criterion Validity

This study analyzed the correlation between the K-PCC and the patient-centeredness measurement tool for inpatients (PEx-inpatient) developed by the Health Insurance Review and Assessment Service to verify the criterion validity of the K-PCC (Table 5). The PEx-inpatient[10] was developed by combining HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) of AHRQ (Agency for Healthcare Research and Quality) of United States and the Inpatient Adult Survey of United Kingdoms. The tool consists of five domains, nurse area, doctor area, medication and treatment process, hospital environment, patient rights guarantee, and two questions regarding overall satisfaction and recommendation intention. The higher the score, the higher the patient-centered medical care. At the time of development, Cronbach's α ranged from 0.79 to 0.94.[10] A correlation analysis showed a significant positive correlation between the K-PCC and PEx-inpatient (r = 0.64, $p < 0.001$). All subfactors of the K-PCC showed significant positive correlations with the PEx-inpatent. Accordingly, the criterion validity of the K-PCC was verified.

Reliability

The K-PCC with verified validity comprises 21 items across the following domains: patient preferences (4 items), physical comfort (2 items), coordination of care (2 items), continuity and transition (3 items), emotional support (2 items), access to medical care (3 items), information and education (2 items), and family and friends (3 items). The mean scores of the subfactors were as follows: patients' preferences (factor 1) = 3.62±0.71, physical comfort (factor 2) = 3.68 ±0.85, coordination of care (factor 3) = 3.63±0.76, continuity and transition (factor 4) = 3.90±0.66, emotional support (factor 5) = 3.43±0.99, access to medical care (factor 6) = 3.67±0.85, information and education (factor 7) = 3.81±0.76, and family and friends (factor 8) = 3.42±0.85. The reliability of the factors was as follows: patients' preferences (factor 1) = 0.79, physical comfort (factor 2) = 0.75, coordination of care (factor 3) = 0.73, continuity and transition (factor 4) = 0.79, emotional support (factor 5) = 0.88, access to medical care (factor 6) = 0.76, information and education (factor 7) = 0.77, and family and friends (factor 8) = 0.78 (Table 6). The K-PCC is shown in Table 7.

Table 5 Correlations Among the K-PCC and PEx-Inpatient (*N*=400)

Measures	Patients' Preferences (Factor 1)	Physical Comfort (Factor 2)	Coordination of Care (Factor 3)	Continuity and Transition (Factor 4)	Emotional Support (Factor 5)	Access to Medical care (Factor 6)	Information and Education (Factor 7)	Family and Friends (Factor 8)	Total PCC
	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)	r(p)
PEx-Inpatient	0.54 (<.001)	0.47 (<.001)	0.43 (<.001)	0.50 (<.001)	0.43 (<.001)	0.49 (<.001)	0.52 (<.001)	0.21 (<.001)	0.64 (<.001)

Abbreviations: K-PCC, Korean version of Patient-centered care; PEx, The patient-centeredness measurement tool for inpatients.

Table 6 Reliability of Korean Version of PCC (21 Items) (*N*=400)

Factor	Number of Items	M±SD	Cronbach's a	
Patients' preferences (Factor 1)	4	3.62±0.71	0.79	0.90
Physical comfort (Factor 2)	2	3.68±0.85	0.75	
Coordination of care (Factor 3)	2	3.63±0.76	0.73	
Continuity and transition (Factor 4)	3	3.90±0.66	0.79	

(*Continued*)

Table 6 (Continued).

Factor	Number of Items	M±SD	Cronbach's a	
Emotional support (Factor 5)	2	3.43±0.99	0.88	
Access to medical care (Factor 6)	3	3.67±0.85	0.76	
Information and education (Factor 7)	2	3.81±0.76	0.77	
Family and friends (Factor 8)	3	3.42±0.85	0.78	

Abbreviations: M, Mean; SD, Standard deviation.

Table 7 The Final Version of K-PCC

Factor 1. Patient's Preferences (4 items)	
1	I felt to be treated importantly.
2	My will and preference were considered when choosing medical treatment.
3	I was involved in decision-making on my treatment.
4	I was helped to determine my own treatment purpose.
Factor 2. Physical comfort (2 items)	
5	(Medical team) paid attention to my physical wellbeing (pain management, difficult breathing, etc.).
6	There was an interest in exhaustion and insomnia.
Factor 3. Coordination of care (2 items)	
7	Everyone in hospital was knowing it well even if I only talked about my situation once.
8	Medical treatment was well coordinated among the staffs involved.
Factor 4. Continuity and transition (3 items)	
9	I was knowing to where and why I should go when being referred to other healthcare providers (expert/nutritionist/physical therapist).
10	There was mutual agreement in advices (eg: medication, etc.) by a wide variety of medical professionals (eg: pharmacist, physician in charge).
11	The medical attendant's treatment was in line with that of other medical experts.
Factor 5. Emotional support (2 items)	
12	Emotional support was provided.
13	Attention was paid to the feelings such as fear, depression, anxiety, etc.
Factor 6. Access to medical care (3 items)	
14	There is no difficulty in going from home to see my doctor and coming back to home
15	There was easy access to general treatment.
16	I could easily make an appointment (related to treatment).
Factor 7. Information and education (2 items)	
17	I know well (about information relevant to treatment).
18	The information that I received was well explained.

(*Continued*)

Table 7 (Continued).

Factor 8. Family and friends (3 items)	
19	My families and caregivers were involved in my treatment with my consent.
20	Attention was paid to the care and support provided by family members.
21	Attention was given to possible questions that may arise from family members.

Discussion

This study verified the validity and reliability of Korean version of PCPC for outpatients. This study clearly showed that the 21-item K-PCC is valid and reliable instrument to measure the patient-centeredness. Creating a patient-centered medical culture in which patient-centered medical service provision and positive medical service experiences improve patient symptom relief and treatment compliance.[34] Accordingly, in South Korea, patient experience is being investigated for inpatients since 2017, as part of the establishment of a patient-centered care culture.[11] The Picker Institute in the United States presented eight conceptual components of patient-centered care through various qualitative research studies to identify the definition and components of patient-centeredness,[36] which greatly contributed to constructing the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) and National Health Service (NHS) Inpatient Survey, which are the cornerstones of patient experience evaluation in South Korea.[2] However, a national tool for measuring patient-centered care have not yet been developed and surveys have not been conducted for outpatients in South Korea. On the other hand, South Korea has a higher percentage of outpatients than hospitalized or emergency patients.[37] In particular, since 2020, the number of outpatients has increased further due to the prevalence of various infectious diseases, such as COVID-19,[38] so it is urgent to investigate the patient experience for outpatients. Therefore, this methodological study verified the validity and reliability of the PCPC tool developed by Cramm and Nieboer[20] into Korean to measure the level of patient-centered care for outpatients. The K-PCC developed in this study is a tool consisting of 21 items across eight factors: patients' preferences, physical comfort, coordination of care, continuity and transition, emotional support, access to medical care, information and education, and family and friends, and the discussion of the tool is as follows.[38]

The biggest reason why the developed K-PCC tool deleted 15 items (items 4, 6, 7, 10, 11, 12, 15, 16, 18, 23, 24, 28, 29, 32, and 33) from the PCPC tool, which consists of 36 items, is South Korea's care delivery system and the low compensation health insurance policy,[39] which differs from developed countries. The care delivery system in South Korea is based on the Medical Act and the National Health Insurance Act, and medical institutions are divided into clinics, general hospitals including university hospitals, and tertiary general hospitals. However, there are no restrictions on the utilization of medical care, and the burden of using tertiary general hospitals and university hospitals is not significant. Additionally, there is no separate cost associated with seeking medical treatment at a tertiary general hospital, and due to an increase in loss insurance subscription, out-of-pocket expenses have often been very small. Therefore, most patients in South Korea have come to prefer general hospitals or advanced general hospitals with large and famous doctors and expensive equipment.[40] Due to the concentration of outpatients in general hospitals, a general hospital that treats 10,000 outpatients per day is like a marketplace.[39] According to OECD data, the number of outpatient treatments per person in South Korea was 16.6, nearly twice that of OECD countries.[41] In the 2021 medical service survey, 56.9% of the respondents stated that the actual time they received outpatient treatment was 1 to 5 minutes.[34] Additionally, there is a reason why university hospitals cannot guarantee profits solely from the treatment of natural suitable diseases due to the low health insurance rate policy in South Korea. This is why certain questions were excluded from the medical environment in South Korea, which is challenging for patient-centered communication because university hospital doctors treat at least 30 to 70 outpatients during the morning or afternoon. Therefore, it is imperative to assess the reliability and validity of PCPC within the specific cultural and healthcare context before implementing it in different cultural and healthcare environments.

The first component, the patient preferences dimension, involves maintaining dignity and treating patients by considering their preferences and motivating them to set and achieve their own treatment goals. To provide patient-centered medical care,

it is important to relieve physical symptoms, such as patient pain or difficulty breathing and provide safety, which corresponds to the second factor of PCPC, physical comfort. With the recent emphasis on multidisciplinary healthcare, patient information should be properly transmitted, shared, and coordinated, among medical staff, as various medical providers such as doctors, nurses, pharmacists, and physical therapists, are involved in providing patient care. This aspect corresponds to the PCPC's third factor, adjustment, and fourth factor, continuity. The fifth dimension of PCPC is emotional support which is, similar to what has been found in previous studies, in that it is necessary to involve emotional support because illness is often accompanied by anxiety and depression, which affects patients' social relationships privacy.[42,43] Patients should also be able to easily schedule and access treatment, which correspond to accessibility, the sixth dimension of the PCPC. The patients themselves are the subjects of disease management, and in the current medical environment, where patient participation in medical care is emphasized, patients must be aware of all aspects of treatment, which can be seen as in line with PCPC's seventh dimension of information and education. Finally, individuals' disease transitions affect their family members and other around them; thus, it is necessary to address their needs and questions and provide adequate support to engage family members in the treatment process.[20] The K-PCC, which includes all the above components, is the tool to measure the composition concept of patient-centeredness, and this study is meaningful in that it has been adapted and verified the PCPC for the first time for use with Korean populations.

The model fit of original tool developed by Cramm and Nieboer[20] was suitable of 36 items with CFI = 0.99, RMSEA = 0.05, and SRMR = 0.08, and the K-PCC was confirmed to be suitable with Model 2, with 21 items, through a model suitability verification process. Although 15 items were deleted from the original tool, the K-PCC was verified as an assessment of the overall concept of patient-centeredness and the suitability of the model was confirmed to be similar to that reported in previous studies. Model 2 was analyzed after removing five items (10, 11, 12, 24, and 29) with a factor load below 0.60 because the AGFI value was 0.77, and the model suitability index was improved to NFI = 0.90, CFI = 0.94, and RMSEA = 0.06, compared were Model 1.

It is hard to compare the convergent and discriminant validity between the original PCPC and K-PCC, since the original PCPC did not report the convergent and discriminant validity. However, the 21-item K-PCC tool verified the construct validity through intensive validity and discriminant validity verification. As a result, the standardized factor loading was at least 0.50, the CR was at least 0.70, and the AVE was at least 0.50; thus, it is a methodologically more valid than previous studies.

To verify the criterion validity of the K-PCC, correlations with the PEx-inpatient developed by the Health Insurance Review and Assessment Service[10] were analyzed and there was a statistically significant correlation between the two tools. The analysis showed significant positive correlations in all subfactors ($r = 0.21$~$.54$, $p < 0.001$). When testing the reference validity, a correlation coefficient between 0.4 to 0.8 is recommended.[44] In this study, the correlation coefficient was confirmed to be 0.4 or higher except for family and friends (Factor 8). This was found to have a relatively low correlation coefficient because the patient-centered tool for inpatients does not include questions related to family and friends, unlike the K-PCC. In the case of Korea, the K-PCC can be said to reflect Korean culture well in that many family opinions are reflected in medical decisions.[32]

As a result of confirming the internal consistency to verify the reliability of the K-PCC, patients' preferences. Physical comfort, coordination of care, continuity and transition, emotional support, access to medical care, information and education, and family and friends had Cronbach's α values of 0.79, 0.75, 0.73, 0.79, 0.88, 0.76, 0.77, and 0.78 respectively, which were similar to those of all original tools, 0.92, 0.72, 0.82, 0.87, 0.74, 0.80, 0.78, and 0.92, respectively. In this study, although the number of items was reduced from 36 in the original tool to 21 in the K-PCC, the overall reliability increased from 0.89 to 0.90. Therefore, the K-PCC can be evaluated as a tool with excellent reliability for measuring patient-centered medical care for outpatients.

This study is meaningful in that the validity and reliability of patient centeredness, which is increasing in the Korean medical environment where the proportion of outpatients is high, were measured by applying an adapted version of the PCC to the Korean outpatient environment. As a result of the analysis, the K-PCC a 21-item tool with confirmed validity and reliability. Therefore, is the K-PCC is expected to be useful for assessing patient-centered medical care perceived by patients who receive outpatient treatment at university hospitals. In addition, this study was able to select participants from more diverse age groups and situations by collecting data in parallel with written and online surveys. Using this mixed method is meaningful in that it was possible to increase the likelihood the research results can be generalized of generalization by

increasing the representativeness of the sample.[45] The research findings have confirmed that K-PCC is a tool with validity and reliability in the healthcare environment of South Korea. Therefore, it is necessary to utilize K-PCC to examine the concept and meaning of patient-centeredness as perceived by patients. Through this, it is important to assess the current healthcare environment in South Korea and establish a patient-centered healthcare environment. By doing so, patients will be able to receive high-quality medical services that align with their values and preferences.

Limitations of the Study

This study collected data by combining non-face-to-face and face-to-face methods. Given that non-face-to-face collection accounted for 75% of the participants, the average age of the participants was 40 years, which was lower than that of the original tool, which had a mean participant age of 74 years. Therefore, the necessity for expanded research is suggested by diversifying the age groups of the participants in the future. It is necessary to verify the K-PCC tool through repeated studies in Korea in that there may be problems with cultural differences and translation meaning in that K-PCC translated tools developed in Western cultures.

Conclusion

This study developed a K-PCC tool in accordance with the Korean medical environment by translating a PCPC tool that measures patient-centered care into Korean to assess the level of patient-centered care delivery for outpatients. The developed K-PCC tool is a 5-point Likert scale, consisting of 8 factors with 21 items.

In this study, statistical analyses were conducted to verify the content validity, construct validity, convergent and discriminant validity, and criterion validity of the K-PCC tool. The results demonstrated high reliability of the tool. Therefore, it was concluded that the K-PCC tool is a valid and reliable instrument for evaluating patient-centeredness among outpatients in South Korea. It is anticipated that the utilization of the K-PCC tool will contribute to assessing and promoting patient-centered care in the Korean medical environment.

Ethical Approval

Prior to face-to-face data collection, the research was approved by the review board of Inje University Ilsan Paik Hospital which the researcher belonged (ISPAIK 2022-09-038-001). Prior to non face-to-face data collection, the research was approved by the reivew board of Ewha Womans Universtiy which the researcher belonged (ewha-202212-0023-01). Our study complies with the Declaration of Helsinki.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

All authors declare no conflicts of interest in this work.

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