Validity And Reliability of the Turkish Version of the Cultural Competence Assessment Tool in Nursing Students

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ABSTRACT

Objective: Increased cultural diversity in society like Turkey is becoming increasingly important to give a holistic nursing care to meet cultural requirements. It is important to assess cultural competence in order to provide appropriate care for cultural needs. The purpose is to adapt the Cultural Competence Assessment Tool (CCATool) for nursing students into the Turkish language and to determine its validity and reliability.

Methods: A total of 400 nursing students were included in the methodological study in Ankara, Turkey. In the validity study of the CCATool were performed language validity, content validity, construct validity, tool response bias and in the reliability study were performed test-retest reliability and internal consistency analysis.

Results: In the content validity analysis the Item Content Validity Index was .91 and the Scale Content Validity Index was .90. The tool Cronbach's α value is .876 and the Cronbach's α values of the sections vary between .706-.821. The scale was determined there is a statistically positive relationship between test-repeat test score averages of the scale.

Conclusions: The results showed that CCATool adapted to Turkish is a valid and reliable scale in determining the cultural competence level of nursing students.

Keywords: Cultural competence, nursing student, validity, reliability, Turkish

1. INTRODUCTION

In this increasingly globalized world, people are migrating for a better standard of living, travel, education, diplomatic asylum (1). In this context, a growing number of people from different cultures are coming to Turkey from abroad. According to the Turkish Statistical Institute, 51,860,042 foreign tourists visited our country in 2019 (2). In addition, according to international patient statistics published by the Turkish Ministry of Health 662,087 patients received health services within the scope of health tourism in 2019 (3). Turkey is importing patients from neighboring countries such as Germany, Azerbaijan, and Iraq. According to the International Organization for Migration's World Migration Report 2020, Turkey, where 3.7 million refugees have taken refuge, is "the country hosting the most refugees"(4).

Health workers who play a role in the delivery of health services to individuals, families, and groups; are expected to take primary responsibility for individuals from different cultures for receiving health care in accordance with the cultures and with an approach that does not exclude their culture (5). Therefore nurses should be educationally prepared to provide culturally congruent health care. To ensure adequate preparation of nursing students, these variables must be fully integrated throughout the nursing curriculum (6). In this way, nursing students can have values and beliefs that meet the cultural needs of patients (7).

Nurse researchers have made significant contributions over the past three decades through the continuous development and improvement of many models and assessment tools to advance their knowledge of the cultural competence literature. These models and tools have raised awareness, understanding and sensitivity that are important in providing culturally competent care to nurses and improving the quality of care for clients of diverse cultural backgrounds (8). Over the years, application of several major cultural competence models in nursing practice, education, research and administration has been used by numerous researchers (9-12).

Papadopoulos, Tilki ve Taylor (PTT) model was developed in the UK in the 1990's to improve cultural competence. According to the model, cultural competence is defined as "ensuring that people are provided effective health care services taking into account their cultural beliefs, behaviors, and needs" and is seen as both a developing process and output throughout life. The model consists of four stages as cultural awareness, cultural knowledge, cultural sensitivity, and cultural practice (competence). Cultural awareness is the first stage in the development of cultural competence. Nurses need to examine their own personal values and beliefs, be aware of and understand the impact of the care they provide to increase their knowledge of cultural identity and ethnic centeredness. The cultural knowledge phase includes nurses gaining multidisciplinary knowledge on their health beliefs and behaviors in various ways, having relationships with individuals from different cultures, understand differences, inequalities, and base different health problems and behaviors on culture. The cultural sensitivity phase includes the development of appropriate communication skills. Finally, cultural competence requires the synthesis and implementation of all previous stages (12).

Cultural competence is an important component of culturally compatible nursing care. In order to reduce healthcare inequalities and identify improvement potentials in nursing practices, researchers need to be able to accurately assess cultural competence (13). There are many tools for the assessment of cultural competence and the Cultural Competence Assessment Tool (CCATool) based on the PTT model used in this study was developed by Papadopoulos, Tilki and Lees. They have determined cultural awareness, cultural knowledge, cultural sensitivity, and cultural practice areas on a scale and focused on these concepts for the development of cultural competence (14-15). This scale measures the levels of cultural competence of nursing students, which can be the basis for planning and implementing educational programs. An evaluation tool is needed to accurately assess the cultural competence of Turkish nursing students. The creation of a valid and reliable tool will facilitate the conduct of relevant studies that will enrich the literature on the cultural competence of nursing students.

2. METHODS

2.1. Study Design and Participants

This study was based on methodological design. The study was conducted between January and December 2018 in the city of Ankara been the capital of Turkey. The research was carried out in two state universities in Ankara city center; 750 3rd and 4th year nursing students in Department of Nursing. Both universities are in the city center and their education curricula and course application areas are similar. It was administered to 400 nursing students who agreed to participate in the study, without choosing a sample. The sample size was estimated based on the criterion that at least 10 participants per item were required for conducting an exploratory factor analysis of an instrument (16). Accordingly, since there were 40 items in CCATool, the study needed to include 400 subjects and the study was carried out with a sample size of 400.

2.2. Research Instrument

The data were collected by using the Personal Information Form and Cultural Competence Assessment Tool (CCATool).

2.2.1. The Personal Information Form: The form prepared by the researcher consists of ten questions including questions such as class, age, gender, family type, place of residence, foreign language knowledge, willingness to work in a different culture, willingness to provide care to patients from different cultures and the necessity of health practices of different cultures in the nursing curriculum.

2.2.2. Cultural Competence Assessment Tool: Data were collected using the CCATool Student version is based on PTT model developed by Papadopoulos, Tilki & Lees. In the reliability study conducted by Papadopoulos, Tilki and Lees (2004) in England, Cronbach's Alpha coefficients of both the scale and the sub-dimensions were determined as greater than 0.80 (15). The scale of four sections including cultural awareness, cultural knowledge, cultural sensitivity and cultural practice. Each cultural section contains 10 statements on a 4-point scale (1=completely disagree, 2=disagree, 4=agree, 5=completely agree). There is no neutral option (3) in the scale, since students have to either agree or disagree with the statements. The maximum total number of points that can be achieved in each section is ten (10) points (1 point per each correct statement). When all four sections of the CCATool are completed the total maximum number of points that can be awarded is forty (40) points. A person is considered to be culturally competent if they achieve a total score of forty (40) points, comprising a score of ten (10) in all of the four sections. The CCATool determines four levels of cultural competence development. The level of cultural competence is calculated by the software formula which then assigns the level according to the following criteria:

Cultural Incompetence: A person is culturally incompetent if they receive a score of less than 5 in the cultural awareness domain. This applies regardless of their score achieved in the other three sections of the CCATool.

Cultural Awareness: A person is culturally aware if they have achieved a score of 5 or more in cultural awareness without necessarily having all of the generic statements in the other areas correct.

Cultural Safety: A person is considered culturally safe if they have achieved a score of 5 or more in cultural awareness and have all the generic statements correct in the other sections.

Cultural Competence: A person is culturally competent if they have achieved a score of 10 in all of the four stages (total of 40 points).

2.3. Translation of the Scale

At the first phase of the validity study of the scale, studies were conducted to ensure language validity. Translation back translation method was used in the language validity phase. In order to ensure language equivalence of the original scale, a team of three experts in their field was formed and the scale was translated from English to Turkish by the team. The original language and translated forms of the scale were compared with each other and the scale was rearranged by the researcher and the consultant. No item was removed from the measurement scale by remaining loyal to the original, as it was not an item that was not suitable for coverage and reduced appearance validity. In the next step of the scale which was translated into Turkish, was translated back into English by three experts in different fields. An English scale was obtained by choosing the most appropriate expressions by comparing the translations made. The final form of the scale was given by comparing the original language and the translated forms with each other and by re-examining the items by the researcher consultant. The scale which took its final form was presented for expert opinion. After the language validition of the scale, the opinions of eight experts (seven experts in cultural competence in nursing and one in the field of Social Anthropology were consulted to ensure content validity. Experts evaluated whether the scale served the specified purpose and in terms of its suitability to Turkish culture. The scale was finalized with appropriate word arrangements in line with expert opinions.

2.4. Pilot Study

The pilot study of the scale whose language and content validity was applied to a group representing the sample. It is generally recommended to apply to a number of people representing 10% of the sample (16). The pilot study was conducted with 82 students and since each item was found to be understandable, no changes were made to the scale. pilot study data were not included in the research sample.

2.5. Data Collection

Data were collected from 400 nursing students who agreed to work two weeks after the pilot study. The scale was applied to 71 students for test-retest analysis five weeks after the first application. Data collection was collected by the researcher in the classroom environment. The administration of the scales took 20-25 minutes.

2.6. Statistical Analysis

Statistical Package for the Social Sciences (SSPS) 20.0 and Analysis of Moment Structures (AMOS) 23.0 statistical program were used for the statistical analysis of the data. Sociodemographic features were analyzed using descriptive statistical analysis. Content validity, construct validity and scale response bias were examined in the validity study of the scale. Content Validity Index was used to evaluate the expert opinions in contect validity. Confirmatory Factor Analysis and Explanatory Factor Analysis methods were used for construct validity. In the Explanatory Factor Analysis, Kaiser-Meyer Olkin (KMO) was used to decide whether the sample size was sufficient or not, and Bartlett test was applied to determine whether the variables correlated with each other. Explanatory factor analysis, principal component and varimax axis rotation method were used and factors with eigen values > 1.0 were determined. Goodness of fit indices were used in confirmatory factor analysis. Computed goodness of fit indices, Pearson's chi square of freedom, approximate root mean square error (RMSEA), root mean square error (RMR), comparative goodness of fit (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI)) includes the increasing fit index (IFI). In the reliability analysis, internal consistency reliability and test-retest reliability were made. The correlation coefficient (r value) was calculated using the Cronbach's Alpha for the internal consistency reliability and the Pearson Product-Moment Correlation test for the test-retest reliability. Hotelling T^2 test was used to calculate the scale response bias. For all statistical analyzes, two-sided p<0.05 was considered statistically significant.

2.7. Ethical Considerations

Permission was obtained from Rena Papadopoulos for the use of CCATool in validity and reliability study. Official permission was obtained from Universities to conduct the research. All procedures in the study were carried out in accordance with the Helsinki Declaration. The study has been approved by the Ankara University Ethical Committee (2018 and 02/28). Written consents were obtained to the participants after the purpose of the study was explained.

3. RESULTS

3.1. Characteristics of the Participants

The average age of the students was 20.88±1.09 years (min:19, max:28), most of students were women (82.5%) and nuclear family (87.5%). Approximately half of the students spent most of their lives in the urban area (53.3%). About half of students reported that they knew any foreign language (47.3%). Most of the students stated that they wanted to work in a different culture (72.8%), provide care to patients from different cultures (88.5%) and health practices related to different cultures should be included in the nursing curriculum (81%) (Table 1).

3.2. Validity Analysis

Content validity, construct validity (explanatory factor analysis and confirmatory factor analysis), scale response bias were performed in the validity analysis.

Content Validity Index was used to evaluate the expert opinions in contect validity. Item Validity Index (I-CVI) and the Scale Validity Index (S-CVI) was calculated for the whole

scale. Eight experts suggestions were consulted for contect validity and it was calculated as I-CVI= 0.91, S-CVI=0.90. Kaiser-Meyer Olkin (KMO) was used to decide whether the sample size was sufficient or not. In the analysis of the scale, KMO value was found 0.847 and Barlett test (c2= 4841.682; p = 0.000). According to this result, the KMO value is in the "very good" range and the Barlett test's significance indicates that the scale is suitable for factor analysis.

Table 1. *Descriptive characteristics of students (N=400)*

Characteristics	n	%
Sex		
Female	330	82.5
Male	70	17.5
Types of Families		
Nuclear Family	350	87.5
Extended Family	50	12.5
The residence where they maintained their lives for the longest time	213	53.3
Urban	187	46.8
Rural		
Foreign Language Knowledge		
Yes	189	47.3
No	211	52.8
Willingness to Work in a Different Culture		
Yes	291	72.8
No	109	27.3
Willingness to Care for Patients from Different Cultures	354	88.5
Yes	46	11.5
No		
The Necessity of Health Practices of Different Cultures in the Nursing Curriculum	324	81.0
Yes	76	19.0
No		

In the explanatory factor analysis of this research, principal component and varimax axis rotation method were used. It was determined that the scale consists of four factors with eigenvalues above 1.00, explaining 40.34%. Cultural awareness section explains 10.124% of total variance, cultural knowledge section explains 9.505% of total variance, cultural sensitivity section explains 9.883% of total variance, cultural practice section explains 10.922% of total variance. As a result of the analysis, the load values of factor 1 are 0.462-0.673; the load values of factor 2 are 0.465-0.650; load values of factor 3 are .401-.690; load values of factor 4 had values varying between 0.342-0.705. These factor loads were found to be at a significant level.

For the construct validity of a scale, the goodness of fit indexes made in the confirmatory factor analysis should be at an appropriate level. Data of the study were applied to confirmatory factor analysis with 40 items, and results were showed in the Table 2. These values showed that the data were compatible with the model, they confirmed the four-factor structure, the items and sections of the scale were related to the scale, and the items in each section defined their factor sufficiently. These results support the construct validity of CCATool-T.

Another important indicator in confirmatory factor analysis is the significance of the regression coefficients. Accordingly, factor loadings are important since the "p" values are less than .001. If factor loadings are significant, it means that items are loaded correctly on factors. In this study, the absolute z value calculated for the parameters is greater than the critical ratio 1.96, and it is seen that all parameters are significantly different from zero (Table 3).

In the study, whether the responses of the students to the scale items were equal or not was evaluated with the Hotelling T² test. As a result of this test Hotelling T² = 534.276, p = 0.000 and it was determined that there was no response bias in the scale.

3.3. Reliability Analysis

The reliability of CCATool-T was determined by internal consistency analysis and test-retest reliability analysis.

The Cronbach's correlation Coefficient of the scale and its sections were calculated to test its internal consistency. The reliability of the scale was examined by calculating Cronbach's alpha coefficient for the total scale (0.876) and for each subsection cultural awareness (0.806), cultural knowledge (0.785), cultural sensitivity (0.783), and cultural practice (0.821) (Table 4).

The scale was re-applied four weeks after the first application and the test-re-test confidence coefficient obtained because of the two measurements applied was evaluated by Pearson Product-Moments Correlation Coefficient. Accordingly, it was determined there is a statistically positive relationship between test-repeat test score averages of the scale. Paired samples T-test was carried out to determine whether there was a difference between the first and second measurement score averages of the scale; no statistically significant difference was found (p =0.000) (Table 4).

Table 2. *Goodness of fit ındex values of the scale*

Index	Good Fit	Acceptable Fit	Output	Assesement of Fit
χ2/sd	0 £ χ2/ sd £ 3	3 £ χ2/ sd £ 5	1.489	Good Fit
RMSEA	0 £ RMSEA£ .05	0.05 £ RMSEA £ 0.08	.037	Good Fit
RMR	0 £ RMR £ .05	0.05 £ RMR £ 0.10	.025	Good Fit
CFI	.97 £ GFI £ 1.00	0.90 £ GFI £ 0.97	.900	Acceptable Fit
GFI	.95 £ GFI £ 1.00	0.90 £ GFI £ 0.95	.869	Acceptable Fit
AGFI	.90 £ AGFI £ 1.00	0.85 £ AGFI £ 0.90	.850	Acceptable Fit
IFI	.95 £ IFI £ 1.00	0.90 £ IFI £ 0.95	.901	Acceptable Fit

Table 3. Confirmatory factor analysis results of the scale

Scales	Item	Standardized Regression Coefficients	Construct Reliability	p
Cultural Awareness	Item 1	.488		.000
	Item 2	.437	6.129	.000
	Item 3	.531	6.998	.000
	Item 4	.385	5.622	.000
	Item 5	.484	6.597	.000
	Item 6	.568	7.273	.000
	Item 7	.481	6.549	.000
	Item 8	.671	7.923	.000
	Item 9	.590	7.429	.000
	Item 10	.606	7.531	.000
Cultural Knowledge	Item 11	.578		.000
	Item 12	.495	9.966	.000
	Item 13	.356	5.612	.000
	Item 14	.570	9.207	.000
	Item 15	.612	8.193	.000
	Item 16	.562	7.690	.000
	Item 17	.567	8.122	.000
	Item 18	.487	6.843	.000
	Item 19	.616	7.859	.000
	Item 20	.350	5.300	.000
Cultural Sensitivity	Item 21	.300		.000
	Item 22	.300	3.553	.000
	Item 23	.300	3.986	.000
	Item 24	.676	4.722	.000
	Item 25	.677	4.722	.000
	Item 26	.408	4.137	.000
	Item 27	.718	4.763	.000
	Item 28	.453	4.285	.000
	Item 29	.376	3.998	.000
	Item 30	.426	4.166	.000
Cultural Practice	Item 31	.521		.000
	Item 32	.547	9.022	.000
	Item 33	.513	7.155	.000
	Item 34	.629	8.109	.000
	Item 35	.616	7.933	.000
	Item 36	.451	6.531	.000
	Item 37	.581	7.742	.000
	Item 38	.412	6.102	.000
	Item 39	.635	8.157	.000
	Item 40	.548	7.367	.000

Table 4. Reliability analysis results of the scale

Scales	Cronbach's Alfa (N=400)	Test-Retest (N=71)			
		r	P	t	p
Cultural Awareness	.806	.967	.000	-3.188	.002
Cultural Knowledge	.785	.993	.000	-8.597	.000
Cultural Sensitivity	.783	.983	.000	-9.695	.000
Cultural Practice	.821	.985	.000	-4.029	.000
Cultural Competence	.876	.992	.000	-9.606	.000

4. DISCUSSION

The adaptation of a pre-developed measurement tool to a different culture is a methodological process and it is desirable to have two features such as validity and confidence. Validity refers to whether an instrument measures what it was designed to measure (17). Language validity, content validity, construct validity and scale response bias were performed in CCATool-T validity analysis.

Content Validity Index was used to evaluate the expert opinions. Polit and Beck have recommended the use of a content analysis index in nursing studies to see the distribution of responses from all specialists and the distribution of each item. I-CVI; it is recommended that if expert opinion of five and below is obtained, the item content validity value should be 0.90 and above if there are six or more experts 0.78 and above and S-CVI; scale content analysis value is recommended to be 0.80 and above (16). In this study, the recommendations of eight experts were applied, I-CVI was found to be 0.91, and S-CVI was found to be 0.90 and are above the recommended values. These results show that the scale and every item on the scale measures the desired concept and does not contain different concepts except for each concept that is desired to be measured.

The structure validity of the scale was tested with descriptive factor analysis and validator factor analysis. The Kaiser-Meyer Olkin (KMO)'s sampling adequacy measurement technique is used to determine whether the sample size is adequate. As the value obtained by this technique approaches 1, the sampling adequacy increases, and as it moves away, it suddenly decreases. A sample size of 0.90 and above is excellent, between 0.80 and 0.90 is very good, and it should be at least over 0.60 (17). In this study, the KMO value is in the "very good" range and the significance of the Barlett test shows that the scale is suitable for factor analysis.

After factor analysis, the rotation technique is used to determine the size under which the items are collected, to increase the load of items in a factor, to make the factors find the item in the highest relationship with them, and to facilitate interpretation. If the eigenvalue of the factors is greater than 1 and above 1, it is considered significant and the analysis is carried out with these factors. The percentages at which the variance of factors with an eigenvalue greater than 1 explains the total variance are calculated. It is considered appropriate that the variance described is over 40% (18). In the explanatory factor analysis, the basic component and varimax axis rotation method were used and it was determined that the scale consisted of four factors with eigenvalues above 1.00 explaining 40,34% of the total variance.

A factor loading value is a coefficient that describes the relationship of items to factors. The loading values of items in the factor in which they are located are expected to be high. If there is a cluster of items that relate highly to a factor, this finding means that those items together measure a concept-structure-factor. In general, the factor loading value

of 0.60 and above is high, regardless of its sign; the loading value between 0.30-0.59 is defined as moderate in size (18). As a result of the analysis, it was determined that the factor loadings were significant.

Confirmatory factor analysis is an extension of descriptive factor analysis. It is one structural equation modeling procedure designed to assess construct validity and is based on previous research and theory, the development of a proposed model, and then testing this model against real-world data (19). In the confirmatory factor analysis carried out in this study, it was determined that it had acceptable harmony with goodness of fit values. These values showed that the data was compatible with the model, confirmed the four-factor structure, that the items and sub-dimensions of the scale were associated with the scale, and that the items in each sub-dimension defined their factor as sufficient. These results support the construct validity of CCATool-T and reveal that it is a valid tool.

In the analysis of the confirmatory factor analyses, another important indicator is the meaningfulness of the regression coefficients. Accordingly, factor loadings are important because the "p" values are smaller than 0.001. Significant factor loadings mean that the items are loaded into the factors correctly. In the confirmatory factor analysis, the C.R. value is divided by the standard error of the parameter estimate and is dispersed as a z-statistic, thus expressing the statistical significance of the parameter (20). In this study, the calculated absolute z value for parameters is greater than the critical ratio of 1.96 and all parameters are significantly different from zero.

One of, he characteristics that the scale should carry is the reliability of the measurement to produce the same results under the same conditions (17). The reliability of the scale was determined by internal consistency analysis and test-retest reliability analysis.

Internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test (21). Cronbach Alpha Reliability Coefficient of the scale and its sub-dimensions is calculated to test the internal consistency of the scale. Cronbach Alpha Reliability Coefficient is considered reliable in cases where it is 0.70 and above, and the values in this study show that the scale is reliable (16). Papadopoulos, Tilki and Lee reliability study in the UK, Cronbach Alpha set the Reliability Coefficients as greater than 0.80 (15). Vasiliou et al., conducted a reliability analysis in Southern Cyprus in 2013, found Cronbach Alpha Reliability Coefficients for cultural awareness for sub-dimensions as 0.786, for cultural knowledge as 0.734, for cultural sensitivity as 0.643, and for cultural practice as 0.826 (22). Internal consistency analysis is similar to these studies, and accordingly, it can be said that the items are interrelated within themselves and serve the entire measurement tool, are equally weighted to each other, in other words, the scale is homogeneous.

The scale was determined there is a statistically positive relationship between test-repeat test score averages of the scale. Vasiliou et al., conducted test-re-test reliability in 2013 with the same scale in Southern Cyprus and found that the scale had good internal consistency and was sufficient for group comparisons (22). The absence of a significant difference after repeated measurements in both studies shows that the scale is reliable.

5. CONCLUSIONS

In this study, the Turkish version of CCATool was found as a valid and reliable measurement tool for evaluating the cultural competence of nursing students. Evaluating the cultural competence of nursing students will contribute to the delivery of quality appropriate care to patients of different cultures. The scale evaluates not only cultural competence but also cultural awareness, cultural knowledge, cultural sensitivity, cultural practice, which are the four sub-dimensions of the scale. This scale will be the first in Turkey evaluated in terms of cultural competence and four sub-dimensions. Adapting this scale will also help create strategies to improve education in multicultural care and allow practitioners to provide beneficial care that respects the individual's culture.

Author Contribution *(Authors initials)*

Research idea: ED, AT

Design of the study: ED, AT

Acquisition of data for the study: ED

Analysis of data for the study: ED, AT

Interpretation of data for the study: ED, AT

Drafting the manuscript: ED, AT

Revising it critically for important intellectual content: ED, AT

Final approval of the version to be published: ED, AT

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