

ORIGINAL ARTICLE

Evaluation of the psychometric properties of the Korean version of the Cultural Competence Assessment

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Abstract

Aim: The 25 item Cultural Competence Assessment assesses the cultural competence of multiple types of healthcare providers. This study aimed to examine the validity and reliability of the Korean version of the questionnaire (KCCA) and to determine the need for changes to improve its validity and reliability.

Methods: Data from 161 hospital nurses were used for the item analysis and to assess the reliability and construct validity of the KCCA before and after the deletion of nine items.

Results: The KCCA did not demonstrate acceptable construct validity and subscale internal reliability. Nine items with high interitem correlations, high modification indices, and relatively lower factor loadings were deleted. The 16 item Modified KCCA showed improved construct validity, convergent and discriminant validity, and reliability.

Conclusion: While further psychometric evaluation of the Modified KCCA should be undertaken with larger samples and diverse professionals, the study's data provide evidence that the Modified KCCA might be a more suitable measure for use among Korean healthcare providers.

Key words: cultural competency, health personnel, psychometrics.

INTRODUCTION

Interest in healthcare providers' cultural competence is no longer limited to nations that have come to symbolize immigrant countries. Recently, in countries with a homogenous population, such as South Korea, the number of residents with diverse cultural and ethnic backgrounds has increased sharply (Flowers, 2004; Kim, 2014; Serizawa, 2007). The number of foreigners who are residing in Korea has increased by 40% in the past 10 years, totaling 1.7 million persons, comprising 3.3% of the country's population (Ministry of Justice, 2014). The reasons for foreigners staying in Korea vary, such as work, marriage immigration, and education. This

group of residing foreigners includes medical tourists, whose main purpose is to receive medical services (Ministry of Justice).

The provision of culturally competent and safe health care to diverse groups requires respect and consideration of clients' cultural background when providing services. In most healthcare organizations, services are provided by a diverse group of personnel from different specialties who also differ in terms of training levels and experience. However, there are limitations to the existing measurement instruments. For example, the Cultural Self-Efficacy Scale of Bernal and Froman (1987) tends to focus on knowledge of a particular ethnic group. Campinha-Bacote's (1999) Inventory for Assessing the Process of Cultural Competence and the Haywood *et al.*, (2014) Cultural Competence Health Practitioner Assessment (CCHPA) require advanced levels of reading comprehension and are suited to specific types of healthcare

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personnel (Schim, Doorenbos, Miller, & Benkert, 2003). Jeffreys' (2000) Transcultural Self-Efficacy Tool and CCHPA, with >80 items and 129 items, respectively, are complicated and time-consuming. Therefore, they are not suitable for measuring the cultural competence of diverse healthcare providers (Schim *et al.*, 2003).

Using the Cultural Competence Model of Schim and Miller (1999) as a theoretical basis, Schim *et al.* (2003) developed the Cultural Competence Assessment (CCA) instrument to measure the cultural competence of multiple types of healthcare providers. Since its development in 2003, the instrument has undergone several revisions. The current 25 item CCA consists of two subscales: the Cultural Awareness and Sensitivity (CAS; 11 items) subscale and the Cultural Competence Behaviors (CCB; 14 items) subscale. The items are rated on a seven-point Likert scale for the CAS (1 = "strongly disagree" to 7 = "strongly agree") and the CCB (1 = "never" to 7 = "always") subscales, with an additional item on the CAS ("no opinion") and the CCB ("not sure") subscales. Four items on the CAS subscale are negatively phrased and are reverse-scored for data analysis. Cultural competence is measured by summing the item responses, except for the "no opinion" and "not sure" responses, and by dividing the score by the total number of items. Higher scores indicate higher cultural competence.

The CCA has been applied to a wide range of healthcare providers, including nurses, nurse practitioners, nursing students, nurse assistants, nutritionists, physical therapists, occupational therapists, social workers, and clerical workers (Benkert, Templin, Schim, Doorenbos, & Bell, 2011; Doorenbos & Schim, 2004; Doorenbos, Schim, Benkert, & Borse, 2005; Lin, Chang, Wang, & Huang, 2015; Marra, Covassin, Shingles, Canady, & Mackowiak, 2010; Ohm & Rosen, 2011; Schim *et al.*, 2003; Schim, Doorenbos, & Borse, 2005, 2006a, 2006b). Although few studies have comprehensively evaluated its reliability and validity (Doorenbos *et al.*; Schim *et al.*, 2003), its reliability has been reported as high (Chae & Kang, 2013).

Most previous studies on the CCA's psychometric properties have been conducted in the USA (Chae & Kang, 2013). Recently, cultural competence scales have been developed in Korea, mainly focusing on service fields, such as clinical nursing (Chae & Lee, 2014), social work (Nho & Kim, 2011), and other helping professions (Choi, 2010); however, there is no Korean version of a comprehensive instrument for use with a variety of healthcare providers with different levels of expertise.

The purpose of this study was to evaluate the psychometric properties of the Korean version of the Cultural Competence Assessment (KCCA) scale and to determine the need for changes to improve its validity and reliability, while retaining the KCCA's original factor structure.

METHODS

This study was conducted from April to May 2013. This study was reviewed and approved by the research ethics committee of the Hallym University.

Participants

Using a convenience sampling method, nurses were recruited from two nursing colleges. They were part-time students who attended Registered Nurse to Bachelor of Science in Nursing (RN-BSN) or Master of Science in Nursing programs in the Seoul metropolitan area and Gangwon Province of South Korea. The eligibility criteria for this study were a clinical nurse who: (i) worked at a hospital with >100 beds; and (ii) had experience of caring for patients with diverse cultural or ethnic backgrounds. Of the 241 nurses who initially responded to the field survey, the data from 161 nurses were used to examine the KCCA's psychometric properties.

Procedures and data collection

Phase I: Translation process

After obtaining authorization to use the CCA from the developer (S. Schim), a native Korean nursing professor translated the questionnaire from English to Korean. A nursing professor and a Korean language teacher reviewed the translated questionnaire for incomprehensible or ambiguous wording and cultural appropriateness. The Korean version then was back-translated to English by a bilingual Korean nursing professor who was teaching in an institution in the USA. The backward translation was compared to the original version by the instrument's developer. She confirmed that the CCA had been translated accurately and that there was no change in the instrument's meaning due to the translation process.

Phase II: Preliminary test

The preliminary testing of the KCCA was conducted on 26 nurses who were working in inpatient units of a general hospital. They were asked to write their opinions if

they found items that were difficult to understand or needed additional explanation. The nurses did not report any problem in understanding and completing the questionnaire; therefore, it was used without revision in the present study.

Phase III: Field test

Nurses from the RN-BSN programs and graduate programs were invited to complete the survey in their classroom, during the break between lectures. The researcher explained the study's purpose and procedures and obtained the participants' written informed consent before data collection. They were informed that they were not obliged to participate in the study and could withdraw at any time. The surveys were returned in an unmarked box in order to ensure the participants' anonymity. A total of 241 nurses responded to the field test. List-wise deletion was used in cases of missing data. As a result, 38 respondents who did not meet the eligibility criteria and 19 with missing data were excluded. Thus, the responses from 185 nurses were analyzed initially in order to evaluate the non-response options. All of the items, excluding Item 2 on the CAS subscale, had at least one person who responded with a "no opinion" response. The items with a high frequency of "no opinion" responses included items 9 (8.1%), 5, 10, and 11 (4.9% each), and 4 (3.2%). The CCB subscale contained "not sure" responses on nine of the 14 items; those with high frequencies of such responses included Item 21 (2.2%) and items 18 and 20 (1.6% each).

Twenty-four nurses who answered the KCCA questions with either "no opinion" or "not sure" responses were excluded, so that the data from 161 nurses were used to examine the KCCA's psychometric properties (Fig. 1). According to Tinsley and Tinsley's suggestions (1987), it was determined that stable factor models can be found with a ratio of about six subjects per item.

Data analysis

The data were analyzed by using PASW SPSS 21.0, AMOS v. 21.0 (IBM Corporation, Armonk, NY, USA) and STATA 14.0 (StataCorp LP, College Station, TX, USA). The item analysis (corrected item-total correlations, interitem correlations, and Cronbach's alpha-if-item-deleted) was conducted. The corrected item-total correlations and interitem correlations of 0.30–0.70 were considered to be satisfactory (Ferketich, 1991). The correlations that were <0.30 indicated low commonality with the other items, whereas the correlations

that were >0.70 indicated possible redundancy, both probably indicating an unnecessary item (Ferketich). The Cronbach's alpha was used to measure the internal consistency of the entire scale and subscales, with a coefficient of 0.70–0.90, indicating adequate reliability (DeVellis, 2012).

A confirmatory factor analysis (CFA) examined the KCCA's psychometric properties and was used to refine the measurement. A CFA detects whether theory-based factors, determined beforehand, are present in the data (Brown, 2015; Pett, Lackey, & Sullivan, 2003). A few studies used the CFA in improved shorter versions of scales when the original version failed to meet the established model fit criteria (Chen, Lai, Chen, & Gaete, 2014; Slotman, Cramm, & Nieboer, 2015; Williams & Brown, 2013). Whereas, item reduction through an exploratory factor analysis (EFA) does not consider the original factor structure, the CFA can produce a more parsimonious structural model that maintains the integrity of the original version (Larwin & Harvey, 2012). Therefore, it was more appropriate to use a CFA than an EFA in this study.

The CFA was carried out by using a maximum likelihood estimator to assess the validity of the hypothesized factor structure and to identify the optimal model. The goodness-of-fit was evaluated by using the χ^2 /d.f. ratio, comparative fit index (CFI), Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA). The model fit was considered acceptable if the χ^2 /d.f. ratio was <2, the RMSEA was <0.06, and both the CFI and TLI measures were >0.95 (Hu & Bentler, 1999).

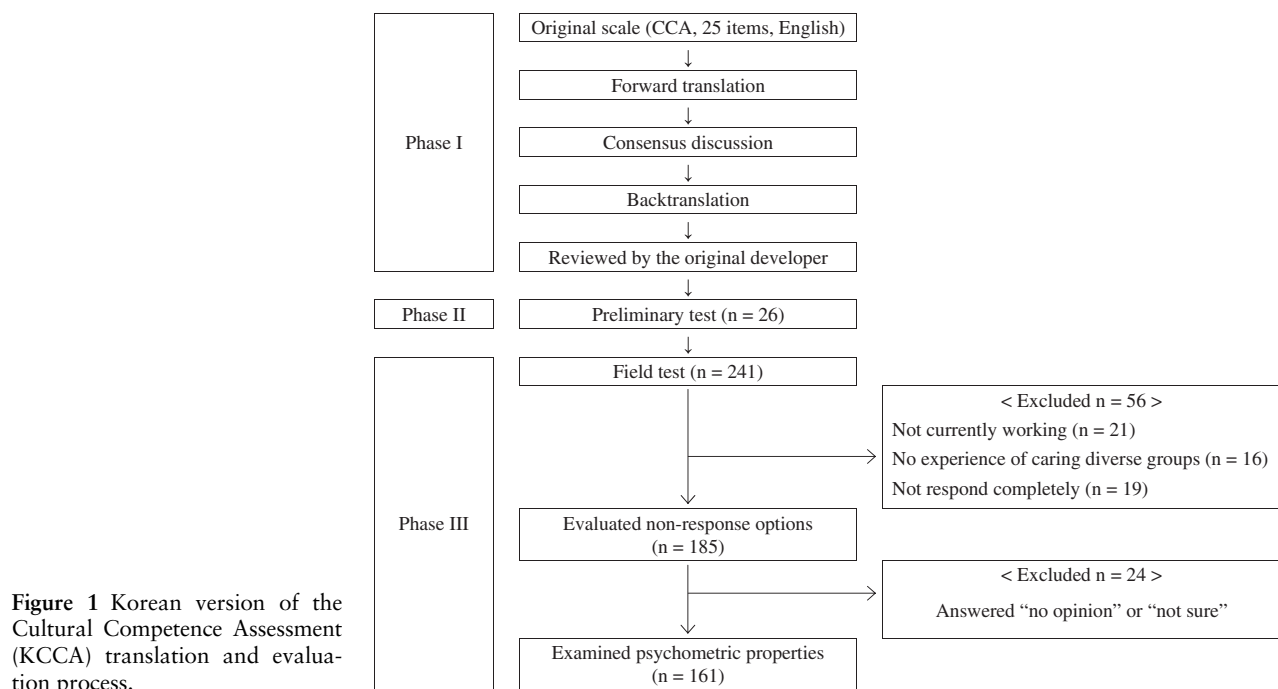
The convergent validity was evaluated by using the average variance extracted (AVE). It was considered to be adequate if the AVE was ≥ 0.50 (Fornell & Larcker, 1981). The discriminant validity was determined when the AVE of each construct was greater than the squared correlations (R^2) between the constructs (Fornell & Larcker).

Based on the initial evaluation (item-total and interitem correlations, factor loadings, and modification indices), nine items were deleted and all the tests were repeated on the modified version.

RESULTS

Sample characteristics

As seen in Table 1, the participants' mean age and work experience were 29.57 and 7.11 years, respectively. Furthermore, 44% of the nurses had a Bachelor's degree.



Most of them were working in medical/surgical units, followed by pediatric/women's health, outpatient, intensive care unit/operating room, and emergency room services. Most of them ($n = 123$, 76.4%) had no experience living abroad for longer than 1 month. Eighty-seven (54.0%) nurses reported that they could speak a foreign language and the primary language that they spoke was English. Few of the participants ($n = 12$, 7.5%) had received education about caring for diverse groups and the participants' frequency of caring for diverse groups was low (59.7% reported only a few times per year). The most common types of diverse groups that the nurses reported caring for were medical tourism patients (27.6%), followed by migrant workers (17.8%), and marriage immigrants (12.0%) (see Table 1).

Initial psychometric properties of the Korean version of the Cultural Competence Assessment

Construct validity

The results of the CFA revealed that none of the goodness-of-fit indices reached acceptable levels in the initial two-factor, 25 item model (Table 2). The standardized regression weights for each item of the KCCA were >0.50 , except for the four negatively phrased items

(e.g. "Race is the most important factor in determining a person's culture") (Table 3).

Convergent and discriminant validity

The AVE value was 0.341 for the Korean version of the Cultural Awareness and Sensitivity (KCAS) and 0.595 for the Korean version of the Cultural Competence Behaviors (KCCB) subscales, indicating good convergent validity for the KCCB but insufficient convergent validity for the KCAS. The squared correlation between the KCAS and the KCCB was 0.007. As the AVEs were >0.007 , the constructs showed sufficient discriminant validity.

Reliability and item analysis

The mean scores and standard deviations for the complete KCCA and the two subscales are presented in Table 4. The Cronbach's alpha was 0.87 for the entire KCCA, 0.64 for the KCAS, and 0.95 for the KCCB, which indicated good reliability for the entire scale, but insufficient reliability for the subscales (DeVellis, 2012) (Table 4). The range of the "Cronbach's alpha-if-item-deleted" coefficients was 0.85–0.89. The scale's item-total correlations were -0.25 – 0.77 , with low corrected item-total correlations for the KCAS subscale and more desirable correlations for the KCCB subscale, except for

Table 1 General characteristics of the participants ($n = 161$)

Characteristic	N (%)	Mean (SD)
Age (years)	–	29.57 (4.75)
Education		
Associate degree	89 (55.3)	–
Bachelor of Science in Nursing	72 (44.7)	–
Work experience (years)	–	7.11 (4.40)
Clinical unit		
Medical/surgical	78 (48.4)	–
Pediatric/women's health	18 (11.2)	–
Outpatient	13 (8.1)	–
ICU/OR	12 (7.5)	–
Emergency room	9 (5.6)	–
Miscellaneous	21 (19.3)	–
Lived abroad for >1 month		
Yes	38 (23.6)	–
No	123 (76.4)	–
Foreign language spoken		
Yes	87 (54.0)	–
No	74 (46.0)	–
Received education on caring for foreign patients		
Yes	12 (7.5)	–
No	149 (92.5)	–
Frequency of caring for diverse groups [†]		
≥1–2 times per week	20 (12.6)	–
1–2 times per month	44 (27.7)	–
A few times per year	95 (59.7)	–
Types of diverse groups [*]		
Medical tourism patients	76 (27.6)	–
Migrant workers	49 (17.8)	–
Marriage immigrants	33 (12.0)	–
Korean nationals abroad	32 (11.6)	–
US armed forces in Korea	31 (11.3)	–
International students	14 (5.1)	–
Miscellaneous	40 (14.5)	–

[†] Included missing values.^{*} included multiple responses.

ICU, intensive care unit; OR, operating room; SD, standard deviation.

four items (>0.70), indicating redundancy (Ferketich, 1991) (Table 3). As for the interitem correlations, the correlation coefficients between items 12 and 13 ($r = 0.72$), 14 and 15 ($r = 0.86$), and 16 and 17 ($r = 0.76$) were >0.70 . In addition, the KCCB subscale had interitem correlations of >0.70 ($r = 0.72$ – 0.92) for six items (items 20, 21, 22, 23, 24, and 25).

Psychometric properties after deleting nine items (Modified Korean version of the Cultural Competence Assessment)

Construct validity

The deletion of the four negatively worded items (items 1, 2, 5, and 8), which performed poorly, did not substantially change the results ($\chi^2/\text{d.f.} = 3.57$, CFI = 0.81, TLI = 0.79, and RMSEA = 0.13). Five more items then were removed (items 12, 14, 16, 21, and 25) with high interitem correlations, high modification indices, and relatively lower factor loadings. After deleting the nine items, the two-factor, 16 item model (Modified KCCA) had a better fit (Table 2). The standardized regression weights of each item of the Modified KCCA were >0.50 (Table 3).

Convergent and discriminant validity

The AVE value was 0.472 for the KCAS and 0.604 for the KCCB, indicating improved convergent validity for both constructs, but still insufficient convergent validity for the KCAS. The squared correlation between the KCAS and the KCCB was 0.010, indicating sufficient discriminant validity.

Table 2 Results of the models' fitness tests, average variance extracted (AVE), and squared correlations (R^2) of the original and Modified Korean version of the Cultural Competence Assessment (KCCA)

Questionnaire	Goodness-of-fit indices				AVE	R^2
	$\chi^2/\text{d.f.}$	CFI	TLI	RMSEA		
Original KCCA	3.60	0.75	0.72	0.13	–	0.007
KCAS	–	–	–	–	0.341	–
KCCB	–	–	–	–	0.595	–
Modified KCCA	1.97	0.93	0.92	0.08	–	0.010
KCAS	–	–	–	–	0.472	–
KCCB	–	–	–	–	0.604	–
Reference	≤ 2.00	≥ 0.95	≥ 0.95	≤ 0.06	≥ 0.500	–

CFI, comparative fit index; KCAS, Korean version of the Cultural Awareness and Sensitivity subscale; KCCB, Korean version of the Cultural Competence Behaviors subscale; RMSEA, root mean square error of approximation; R^2 -values, squared correlations between the constructs; TLI, Tucker–Lewis index.

Table 3 Factor loadings and item analyses of the Korean version of the Cultural Competence Assessment (KCCA) and the Modified Korean version of the Cultural Competence Assessment

Item	KCCA		Modified KCCA	
	Factor loading	Item-total correlation	Factor loading	Item-total correlation
KCAS				
1. Race is the most important factor in determining a person's culture (R)	−0.41	−0.18	–	–
2. Persons with a common cultural background think and act alike (R)	−0.40	−0.24	–	–
3. Many aspects of culture influence health and health care	0.63	0.23	0.57	0.33
4. Aspects of cultural diversity need to be assessed for each individual, group, and organization	0.65	0.16	0.62	0.25
5. If I know about a person's culture, I do not need to assess their personal preferences for health services (R)	0.20	−0.25	–	–
6. Spiritual and religious beliefs are important aspects of many cultural groups	0.65	0.18	0.63	0.23
7. Individual persons might identify with more than one cultural group	0.56	0.33	0.56	0.41
8. Language barriers are the only difficulties for recent immigrants to Korea (R)	0.23	−0.21	–	–
9. I believe that everyone should be treated with respect, no matter what their cultural heritage	0.72	0.21	0.73	0.28
10. I understand that persons from different cultures might define the concept of cultural heritage in different ways	0.77	0.26	0.79	0.32
11. I think that knowing about different cultural groups helps direct my work with individuals, families, groups, and organizations	0.82	0.25	0.84	0.32
KCCB				
12. I include cultural assessment when I do individual or organizational evaluations	0.64	0.62	–	–
13. I seek information on cultural needs when I identify new persons in my work or school	0.69	0.65	0.66	0.60
14. I have resource books and other materials available to help me learn about persons from different cultures	0.69	0.57	–	–
15. I use a variety of sources to learn about the cultural heritage of other persons	0.76	0.65	0.75	0.60
16. I ask persons to tell me about their own explanations of health and illness	0.70	0.66	–	–
17. I ask persons to tell me about their expectations for health services	0.75	0.69	0.75	0.63
18. I avoid using generalizations to stereotype groups of persons	0.76	0.70	0.77	0.66
19. I recognize potential barriers to service that might be encountered by different persons	0.66	0.63	0.68	0.63
20. I remove obstacles for persons of different cultures when I identify barriers to service	0.87	0.73	0.86	0.70
21. I remove obstacles for persons of different cultures when persons identify barriers to me	0.87	0.74	–	–

Table 3 Continued

Item	KCCA		Modified KCCA	
	Factor loading	Item-total correlation	Factor loading	Item-total correlation
22. I welcome feedback from clients about how I relate to persons from different cultures	0.77	0.74	0.78	0.72
23. I find ways to adapt my services to individual and group cultural preferences	0.85	0.77	0.87	0.76
24. I document cultural assessments if I provide direct client services	0.88	0.77	0.84	0.73
25. I document the adaptations I make with clients if I provide direct client services	0.85	0.76	–	–

KCAS, Korean version of the Cultural Awareness and Sensitivity subscale; KCCB, Korean version of the Cultural Competence Behaviors subscale; R, reverse-scored items.

Items in bold are those that have been included in the modified version of the KCCA.

Reliability and item analysis

The mean scores and standard deviations for the entire Modified KCCA scale and each of its subscales are presented in Table 4. The Cronbach's alpha was 0.88 for the entire Modified KCCA, 0.86 for the KCAS, and 0.93 for the KCCB. The item-total correlations of the 16 items ranged from 0.23 to 0.76 (Table 3). The interitem correlations of all the items were >0.30 and <0.70 , except for three items with interitem correlations that were >0.70 ($r = 0.76$ for items 20 and 23; $r = 0.74$ for items 20 and 24; and $r = 0.74$ for items 23 and 24), which were retained because these items measure different content areas. The entire KCCA strongly correlated with the entire Modified KCCA ($r = 0.96$).

DISCUSSION

Due to a growing culturally and ethnically diverse population in South Korea, the cultural competence of healthcare providers has become one of the essential phenomena in nursing research in South Korea (Chae & Lee, 2014; Nho & Kim, 2011). Although the

CCA has been used in the USA for more than a decade, its validity and reliability has not been tested in South Korea. This study was the first report of its Korean version's psychometric properties and it suggested changes to improve its validity and reliability.

Previous studies on the CCA confirmed two factors (CAS and CCB) through an EFA (Doorenbos *et al.*, 2005; Schim *et al.*, 2003). In this study, the two-factor, 25 item KCCA did not fit the model. After deleting the relatively poorly functioning nine items, the two-factor, 16 item Modified KCCA produced the best model fit, although the CFI, TLI, and RMSEA indices did not meet optimal values (Hu & Bentler, 1999). Given the small sample size, which increases the likelihood of incorrectly rejecting true models (Hu & Bentler), the Modified KCCA demonstrated an acceptable model fit and parsimony.

The discriminant validity of the two subscales was proven in the original, as well as the modified, version. However, low convergent validity was observed for the KCAS subscale in the original version. This could suggest that a set of items in the KCAS presume to measure more than one construct (Hair, Black, Babin,

Table 4 Descriptive statistics and Cronbach's alphas of the Korean version of the Cultural Competence Assessment (KCCA) and the Modified Korean version of the Cultural Competence Assessment

Questionnaire	Number of items	Mean (SD)	Cronbach's alpha
KCCA	25	4.45 (0.65)	0.87
KCAS	11	5.14 (0.54)	0.64
KCCB	14	3.91 (1.15)	0.95
Modified KCCA	16	4.85 (0.75)	0.88
KCAS	7	6.01 (0.71)	0.86
KCCB	9	3.95 (1.15)	0.93

KCAS, Korean version of the Cultural Awareness and Sensitivity subscale; KCCB, Korean version of the Cultural Competence Behaviors subscale; SD, standard deviation.

Anderson, & Tatham, 2006). The Modified KCCA showed improved, but slightly insufficient, convergent validity.

The internal consistency of the entire scale was good; however, the Cronbach's alpha was too low for the KCAS subscale and too high for the KCCB subscale (DeVellis, 2012). These results are consistent with those found in previous studies (Benkert *et al.*, 2011; Schim *et al.*, 2003, 2005, 2006a; Starr & Wallace, 2009, 2011). After deleting four negatively worded items from the KCAS and five items from the KCCB, the Cronbach's alpha increased by 0.01 for the Modified KCCA and markedly increased, by 0.22, for the Modified KCAS.

The internal consistency is affected by how strongly the items correlate with one another, as well as by the number of items in the scale (DeVellis, 2012). However, the reliability of the entire scale and the KCAS subscale improved after the deletion of the nine items. The correlations between the entire scale and the subscales of the KCCA and the Modified KCCA were strong ($r = 0.96$), suggesting that the use of the Modified KCCA to measure the cultural competence of healthcare providers is appropriate.

The mean scores of the KCAS and Modified KCAS were higher than those of the KCCB and Modified KCCB. These results are supported by previous reports of a higher mean score on the CAS than on the CCB (Lin *et al.*, 2015; Starr & Wallace, 2009, 2011). The definition of the CCB is based on the results of contact experiences with diverse groups, an improvement of awareness, and the refinement of sensitivity (Doorenbos *et al.*, 2005). Therefore, the theory assumes that the CAS precedes the nurse's capability to engage in the CCB.

The reasons for not supporting the reliability and validity of the original 25 item version can be explained by two factors. First, the items with low correlations on the KCAS subscale decreased the reliability and validity of the scale. In the initial item analysis, none of the KCAS items, except for Item 7, reached an acceptable level (0.30–0.70) (Ferketich, 1991). The items with item-total correlations that were <0.30 might have measured different constructs than the other items (Ferketich). Negative item-total correlations were found for the four negatively worded items in the KCAS subscale after they were reverse-scored, which drastically decreased the reliability (Pett *et al.*, 2003).

The negatively worded items were used to avoid acquiescence or agreement bias; however, previous studies have reported that these items confuse the respondents, leading to less consistency in their

responses and weaker item-total correlations, thereby lowering the scale's reliability (DeVellis, 2012; Roszkowski & Soven, 2010; Solís Salazar, 2015). Moreover, negative items tend to be more intercorrelated, thus impairing the scale's validity (Solís Salazar). The same problem was observed in the present study.

It was known that negative items are even more problematic when used in translated scales (Han, Kim, & Weinert, 2002; Wong, Rindfleisch, & Burroughs, 2003). Wong *et al.* examined the Material Value Scale among adults from the USA, Singapore, Thailand, Japan, and Korea. They found that the East Asians interpreted the negative items differently than did the Americans. Rather than representing opposite ends of the same construct, the respondents considered that the positive and the negative items were not related (Wong *et al.*). Similarly, Han *et al.* evaluated the Korean version of the Personal Resource Questionnaire with Korean adults and found that the negative items were intercorrelated and that the validity was impaired.

In this study, Korean nurses might not have interpreted the negative item, "Race is the most important factor in determining a person's culture," as the scale developers could have intended. The reason for the problems could be either related to carelessness or problems in understanding the content (Roszkowski & Soven, 2010). Given that only a few of the nurses in this study's sample had undergone cultural competence education, it is suspected that the respondents did not carefully reflect on the unfamiliar survey questions. Another problem might be the influence of cultural norms. In Asian countries, agreeableness is usually considered as an important social norm, which could influence the respondents to agree to both the negative and the positive items (Wong *et al.*, 2003).

Second, the redundant items on the KCCB subscale caused unnecessarily high reliability and decreased the model fit. In contrast to the KCAS, all the items on the KCCB subscale had an item-total correlation of >0.30 and six items were >0.70 . The interitem correlation coefficients of the same six items were >0.70 , suggesting redundancy (Ferketich, 1991). For example, the participants might interpret Item 14, "I have resource books and other materials available to help me learn about persons from different cultures," and Item 15, "I use a variety of sources to learn about the cultural heritage of other persons," as repetitive questions. After deleting five redundant items on the KCCB, an improvement was observed in the subscale's reliability and model fit.

In addition, the response set of the KCCA is important. Before the psychometric properties of the KCCA

were tested in the present study, the non-response (“no opinion” or “not sure”) items were analyzed. In order to distinguish the neutral responses from the non-responses, Schim *et al.* (2003) included “no opinion” and “not sure” in the responses, so that cultural competence would be calculated from the items other than those that could be answered with non-response options.

In this study, 24 (13.26%) nurses answered either “no opinion” or “not sure.” However, no previous study had analyzed the non-response options, owing to which the frequencies could not be compared. It is assumed that the reason for choosing these options might have been related to the nurses’ lack of knowledge about the related topic, difficulty in deciding on a response, or because the item was vague or difficult to understand. In the case of a respondent selected non-response options to numerous items, interpreting the respondent’s cultural competence using the measured value could be problematic. Saris and Gallhofer (2007) indicated that if >10% of the study’s participants select the non-response options, the response set might not be appropriate for the studied population. Furthermore, if the participants pick the “others” response, it is difficult to analyze the data meaningfully (Grove, Burns, & Gray, 2013). Therefore, additional items that elicit the reasons for choosing the non-response options and a clear guideline to determine the data that have been obtained from the answers are needed.

Limitations of the study

This study is limited by the small sample size and the fact that it consisted only of nurses who worked in hospitals. Future studies are necessary that use larger samples, including a multitude of different healthcare providers with a variability in specialty areas, training levels, and experience.

Given that >10% of the respondents selected the non-response options in the field test, an in-depth examination of the respondents’ understanding of the items needs to be conducted. Future studies using cognitive interviews, instead of a survey, should be attempted in order to reveal how the respondents understand the question and arrive at an answer.

CONCLUSION

In summary, the original 25 item KCCA did not demonstrate acceptable construct validity, convergent validity, and subscale reliability. After deleting the relatively

poorly functioning nine items, the 16 item Modified KCAS showed improved construct validity, convergent and discriminant validity, and reliability. The negatively worded items, especially in the translated version, performed poorly and decreased the scale’s reliability and validity. Although further psychometric evaluation of the Modified KCCA should be undertaken with larger samples and diverse professionals, these data provide evidence that the Modified KCCA might be a more efficient and suitable measure for use among Korean healthcare providers.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

D. C. and K. K. contributed to the conception and design of this study and carried out the data collection; D. C. conducted the statistical analysis and drafted the manuscript; R. B. and A. Z. D. developed the CCA instrument; and K. K., R. B., and A. Z. D. critically reviewed and made revisions to the paper regarding important intellectual content.

REFERENCES

- Benkert, R., Templin, T., Schim, S. M., Doorenbos, A. Z. & Bell, S. E. (2011). Testing a multi-group model of culturally competent behaviors among underrepresented nurse practitioners. *Research in Nursing & Health*, 34, 327–341.
- Bernal, H. & Froman, R. (1987). The confidence of community health nurses in caring for ethnically diverse populations. *Journal of Nursing Scholarship*, 19, 201–203.

- Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. Guilford Publications. New York: NY.
- Campinha-Bacote, J. (1999). A model and instrument for addressing cultural competence in health care. *The Journal of Nursing Education*, 38, 203.
- Chae, D. H. & Kang, K. H. (2013). Review of self-administered instruments to measure cultural competence of nurses – focused on IAPCC & CCA. *Journal of Korean Academy of Nursing Administration*, 19, 48–62.
- Chae, D. H. & Lee, C. Y. (2014). Development and psychometric evaluation of the Korean version of the cultural competence scale for clinical nurses. *Asian Nursing Research*, 8, 305–312.
- Chen, M.-Y., Lai, L.-J., Chen, H.-C. & Gaete, J. (2014). Development and validation of the short-form Adolescent Health Promotion Scale. *BMC Public Health*, 14, 1.
- Choi, S. Y. (2010). A study on the development of cultural competence measure for helping professions. *Journal of Community Welfare*, 35, 23–53.
- DeVellis, R. F. (2012). *Scale development: Theory and applications* (Vol. 26). Thousand Oaks, CA: Sage.
- Doorenbos, A. Z. & Schim, S. M. (2004). Cultural competence in hospice. *American Journal of Hospice and Palliative Medicine*, 21, 28–32.
- Doorenbos, A. Z., Schim, S. M., Benkert, R. & Borse, N. N. (2005). Psychometric evaluation of the cultural competence assessment instrument among healthcare providers. *Nursing Research*, 54, 324–331.
- Ferketich, S. (1991). Focus on psychometrics. Aspects of item analysis. *Research in Nursing & Health*, 14, 165–168.
- Flowers, D. L. (2004). Culturally competent nursing care. A challenge for the 21st century. *Critical Care Nurse*, 24, 48–52.
- Fornell, C. & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39–50.
- Grove, S. K., Burns, N. & Gray, J. R. (2013). *The practice of nursing research: Appraisal, synthesis, and generation of evidence*. St. Louis, MO: Saunders.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. & Tatham, R. L. (2006). *Multivariate data analysis* (Vol. 6). Upper Saddle River, NJ: Pearson Prentice Hall.
- Han, H. R., Kim, M. T. & Weinert, C. (2002). The psychometric evaluation of Korean translation of the Personal Resource Questionnaire 85-Part 2. *Nursing Research*, 51, 309–316.
- Haywood, S. H., Goode, T., Gao, Y., Smith, K., Bronheim, S., Flocke, S. A. & Zyzanski, S. (2014). Psychometric evaluation of a cultural competency assessment instrument for health professionals. *Medical care*, 52(2), e7.
- Hu, L. T. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Jeffreys, M. R. (2000). Development and psychometric evaluation of the transcultural self-efficacy tool: A synthesis of findings. *Journal of Transcultural Nursing*, 11, 127–136.
- Kim, H. M. (2014). *We always leave home: Becoming migrants in South Korea*. Seoul: Dolbegae.
- Larwin, K. & Harvey, M. (2012). A demonstration of a systematic item-reduction approach using structural equation modeling. *Practical Assessment, Research & Evaluation*, 17, 1–19.
- Lin, C. J., Chang, P.-R., Wang, L. H. & Huang, M. C. (2015). Cultural competence course for nursing students in Taiwan: A longitudinal study. *Nurse Education Today*, 35, 1268–1274.
- Marra, J., Covassin, T., Shingles, R. R., Canady, R. B. & Mackowiak, T. (2010). Assessment of certified athletic trainers' levels of cultural competence in the delivery of health care. *Journal of Athletic Training*, 45, 380.
- Ministry of Justice. (2014). The 2014 monthly statistics report of policies on immigration and foreigner-related matters. [Cited 1 July 2014.] Available from URL: http://www.immigration.go.kr/HP/COM/bbs_003/ListShowData.do?strNbodCd=noti0097&strWrtNo=140&strAnsNo=A&strOrgGbnCd=104000&strRtnURL=IMM_6070&strAllOrgYn=N&strThisPage=1&strFilePath=imm/ (in Korean).
- Nho, C. R. & Kim, J. H. (2011). Development of Korean cultural competency scale for human service workers. *Korean Journal of Social Welfare*, 63, 207–231 (in Korean).
- Ohm, R. & Rosen, L. (2011). Psychometric evaluation of the perceived prejudice in health care scale-modified (PPHC-M) among baccalaureate student nurses. *Journal of Transcultural Nursing*, 22, 282–289.
- Pett, M. A., Lackey, N. R. & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Thousand Oaks, CA: Sage.
- Roszkowski, M. J. & Soven, M. (2010). Shifting gears: Consequences of including two negatively worded items in the middle of a positively worded questionnaire. *Assessment and Evaluation in Higher Education*, 35, 113–130.
- Saris, W. E. & Gallhofer, I. N. (2007). *Design, evaluation, and analysis of questionnaires for survey research* (Vol. 548). Hoboken, NJ: John Wiley & Sons.
- Schim, S. M., Doorenbos, A. Z. & Borse, N. N. (2005). Cultural competence among Ontario and Michigan healthcare providers. *Journal of Nursing Scholarship*, 37, 354–360.
- Schim, S. M., Doorenbos, A. Z. & Borse, N. N. (2006a). Cultural competence among hospice nurses. *Journal of Hospice & Palliative Nursing*, 8, 302–307.
- Schim, S. M., Doorenbos, A. Z. & Borse, N. N. (2006b). Enhancing cultural competence among hospice staff. *American Journal of Hospice and Palliative Medicine*, 23, 404–411.

- Schim, S. M., Doorenbos, A. Z., Miller, J. & Benkert, R. (2003). Development of a cultural competence assessment instrument. *Journal of Nursing Measurement*, 11, 29–40.
- Schim, S.M. & Miller, A. (1999). *Cultural competence program core components*. Paper presented at The Henry Ford Health System/Oakland University Center for Academic Nursing; XXX, Detroit, MI.
- Serizawa, A. (2007). Developing a culturally competent health care workforce in Japan: Implications for education. *Nursing Education Perspectives*, 28, 140–144.
- Slotman, A., Cramm, J. M. & Nieboer, A. P. (2015). Validation of the Dutch Aging Perceptions Questionnaire and development of a short version. *Health and Quality of Life Outcomes*, 13, 1.
- Solís Salazar, M. (2015). The dilemma of combining positive and negative items in scales. *Psicothema*, 27, 192–200.
- Starr, S. & Wallace, D. C. (2009). Self-reported cultural competence of public health nurses in a southeastern US public health department. *Public Health Nursing*, 26, 48–57.
- Starr, S. S. & Wallace, D. C. (2011). Client perceptions of cultural competence of community-based nurses. *Journal of Community Health Nursing*, 28, 57–69.
- Tinsley, H. E. A. & Tinsley, D. J. (1987). Use of factor analysis in counseling psychology research. *Journal of Counseling Psychology*, 34, 414–424.
- Williams, B. & Brown, T. (2013). A confirmatory factor analysis of the Self-Directed Learning Readiness Scale. *Nursing & Health Sciences*, 15, 430–436.
- Wong, N., Rindfleisch, A. & Burroughs, J. E. (2003). Do reverse-worded items confound measures in cross-cultural consumer research? The case of the Material Values Scale. *The Journal of Consumer Research*, 30, 72.