

Cross-cultural Adaptation and Validation of the Korean Version of the Moral Identity Scale in Intensive Care Unit Nurses

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Abstract

Background: Korean intensive care unit (ICU) nurses face a variety of moral conflict situations. What makes nurse give up other values and choose moral values? To answer this question, scholars began to study a concept termed “moral identity.” However, despite the increased importance of nurses’ moral identity, it has not been thoroughly studied using empirical data analysis. Instruments developed to predict moral behavior need evidence of their reliability and validity for rigorous research. The purpose of this paper is to report psychometric properties of the Korean version of the Moral Identity Scale in Intensive Care Unit nurses. **Methods:** The aim of this study was to assess the reliability and validity of the Korean version of the MIS (K-MIS) developed by Aquino & Reed. Data were collected from 207 ICUs. Exploratory and confirmatory factor analysis were used to test the construct validity.

Research question/aim/objectives: The aim of this study was to assess the reliability and validity of the Korean version of the MIS (K-MIS) developed by Aquino & Reed.

Results: The results of exploratory factor analysis showed that the Eigen values ranged from 1.63 to 4.47 and comprised 52.17% of the total explained variance. Confirmatory factor analysis showed acceptable model fit indices ($\chi^2 (p) = 28.822 (.051)$, $df = 18$, root mean square error of approximation = .076, GFI = .937, Tucker-Lewis index = .93, comparative fit index = .955) and standardized factor loadings (.45 to .82).

Conclusion: As a professional, the ICU nurse must protect and advocate for the patient. In this respect, K-MIS is a acceptable tool to measure the moral identity of ICU nurses in Korea. Therefore, it is expected that the K-MIS will be used in nursing education programs to improve the moral identity of ICU nurses.

Introduction

Nursing is a profession that provides services centered on human beings, and all situations related to people can involve ethical and moral problems (Kim, 2015). In other words, nursing practice is inherently ethical (Deschenes & Kynyk, 2020). Nurses have the difficult experience of making good or bad decisions about life or death; complex situations can arise in caring for patients, and nurses can face high levels of legal and ethical responsibility in these situations (Kleemola et al., 2020). These moral problems are comparable between Western nurses and non-Western nurses (Prompahakul & Epstein, 2020). As a professional, the nurse is a moral agent responsible for protecting and advocating for their patient (Deschenes & Kynyk, 2020). So, what is the source of moral action? For example, during the pandemic of COVID-19 currently impacting the world, some nurses in Hong Kong went on strike, demanding that the border with China be cut off to prevent Coronavirus disease-19 (COVID-19) from flowing from China. On the other hand, in February 2020, volunteer nurses from all over the country flocked to Daegu, South Korea to treat patients when the medical system collapsed due to the explosion of COVID-19 patients (Chan, 2020; Choi, 2020). What makes nurse give up other values and choose moral values? To answer these questions, scholars began to study the concept termed “moral identity” (Aquino & Reed, 2002).

Moral identity connotes a commitment consistent with one's sense of self to lines of action that support or protect the welfare of other people and is defined as a self-concept organized around a set of moral traits (Aquino & Reed, 2002; Lapsley & Narváez, 2004). This moral identity is usually based on the appraisal that an action has moral worth (Lapsley & Narváez, 2004). In other words, the stronger the moral traits that define a person's moral identity, the more likely it is that this identity will be invoked across a wide range of situations and the stronger its association with moral behavior (Aquino & Reed, 2002). This "moral identity" is an important concept for nurses, who have a professional responsibility to act morally. In particular, "moral identity" is an important concept for intensive care unit (ICU) nurses who have conflicting positions among various stakeholders, including medical staff, caregivers, and family members, and who may have work difficulties arise due to the various moral pains and frustrations of terminal patients (Henrich et al., 2017; Lluch-Canut et al., 2020; Mills & Cortezzo, 2020). There are various empirical studies on moral identity in the general public, such as research on the relationship between adolescents' cyberbullying and moral identity (Wang, 2019), between incentive manipulation and moral identity in the business context (Aquino, 2009), and between stigma and moral identity in the advice of a debtor (Andelic, 2019). Yet, despite the increased importance of nurses' moral identity, it has not been thoroughly studied using empirical data analysis. Additionally, it is very difficult to find an appropriate instrument for measuring moral identity in Korean nurses. Generally, moral identity is measured using Aquino and Reed's Moral Identity Scale (MIS) (Aquino & Reed, 2002). This scale identifies how important the overall imagery of a moral person is to a person. MIS further divides the concept of moral identity into "internalization" and "symbolization." Internalization refers to the importance of the moral character to an individual's self-concepts, whereas symbolization refers to the degree to which the ego based on the moral character is expressed externally. This scale measures the question, "What value I prefer and pursue," and it has the advantage of simultaneously measuring "How do I want to be reflected to others?" Since the scales were developed within a western cultural context, it is necessary to assess a new scale for measuring "moral identity" in Korean nurses. Therefore, the purpose of this study was to validate a Korean MIS (K-MIS) in a Korean cultural context. The K-MIS developed in this study will be used to establish the basis for domestic and international comparative research. Then, it will be used to create strategies that foster the morality of nurses.

Methods

Design & Participants

This study employed a methodological design to test the validity and reliability of the Korean version of the MIS. The participants in this study were a non-probability convenience sample (n = 207) of critical care nurses recruited from four university hospitals located in the Southeast region of South Korea. Of the 230 questionnaires distributed, 209 were returned, for a response rate of 90%. Two questionnaires lacked responses; thus, a total of 207 questionnaires were analyzed. The inclusion criterion for this study was being a critical care nurse. The exclusion criteria consisted of those nurses who were not willing to participate. All participants provided informed consent prior to participation. Data were collected in

February and March of 2017. Each nurse was given a unique identification number, and no names or any identifying personal information was recorded.

For cross validation, the subjects in the exploratory factor analysis and confirmatory factor analysis were different in this study. Therefore, in this study, 207 participants were randomly selected using the IBM SPSS Version 26 & AMOS Version 23 program to construct different subjects for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Approximately 100 participants are considered appropriate for factor analysis (MacCallum et al., 1999; Mundfrom et al., 2005). Thus, 103 people were used for EFA, and 104 people were used for CFA.

Instruments

MIS. The MIS was originally developed and validated by Aquino and Reed (Aquino & Reed, 2002) in the United States, to assess the association between moral identity, moral cognitions, and behavior of adolescents, college students, and adults. It asks participants to consider a person with characteristics often associated with moral probity (i.e., fair, kind, caring, honest). Then, MIS asks that they “try to answer questions by imagining how people with these characteristics will think, feel, and act.” The MIS consists of 10 items with two factors: internalization (5 items) and symbolization (5 items). The 7-point Likert-type scale ranges from strongly agree to strongly disagree, with higher scores representing higher moral identity. Some examples of items are “Being someone who has these characteristics is an important part of who I am (internalization),” “The kinds of books and magazines that I read identify me as having these characteristics (symbolization).” The scores of two items were reversed: items numbered 4 and 7 for internalization. Cronbach’s α for the 5-item MIS internalization and 5-item MIS symbolization in this study were .83 and .82, respectively ($r_a = .86$).

At the time of development, an EFA of 10 items for 363 business department college students in three US universities showed that the cumulative explanatory power was 71.5% (Aquino & Reed, 2002). A CFA was performed on 347 adults graduating from Delaware's College of Business and Economics. Therefore, cross validation was secured. At the time of development, the results of the CFA showed $\chi^2 = 205.96$ ($p < .001$), RMSR = .04, comparative fit index (CFI) = .87, GFI = .93, NFI = .84 in a group of 347 adult graduating from Delaware's college of business and economics (Aquino & Reed, 2002).

Authentic Leadership Inventory. To confirm the convergence validity of MIS, the concept of authentic leadership, which consistently showed a positive correlation with moral identity ($r = .51, p < .001, r = .55, p < .001$), was selected (Olsen & Espevik, 2017; Zhu et al., 2011). Authentic Leadership has recently attracted attention as a concept that values the morality of a leader; it is a “root concept,” forming the basis of the positive aspects of charismatic, transformational, spiritual, and ethical leadership theories (Ilies et al., 2005). Luthans and Avolio described the authentic leader as someone who is, “confident, hopeful, optimistic, resilient, moral/ethical, future-oriented, and gives priority to developing associates to be leaders. The authentic leader is true to him/herself” (as cited in Cameron et al., 2003, p. 243). This study employed the Authentic Leadership Inventory (ALI) developed by Neider & Schriesheim (Neider &

Schriesheim, 2011). The ALI consists of 14 items, The 5-point Likert-type scale ranges from strongly agree to strongly disagree, with higher scores representing higher authentic leadership.

Procedure

Translation and Back Translation Process. Approval for use and adaptation was received by email from the tool developer Aquino and Reed (Aquino & Reed, 2002), and the tool was subsequently translated. The original tools written in English were first translated by Koreans fluent in English at Seoul National University's Language Education Institute. According to the World Health Organization's Process of translation and adaptation of instruments guidelines (WHO, 2017), the primary translator should have knowledge of the English-speaking culture, but their native language should be the primary language of the target culture. Thus, the primary translator was a Korean who graduated from an American university. The translator was satisfied with the forward translator criteria of the WHO (WHO, 2017).

The primary translation was revised and supplemented by finding inappropriate expressions or concepts with the advice of a bilingual nursing professor fluent in English. The created Korean version was sent to Seoul National University's language education institute and was then translated back into English by a bilingual translator, whose first language was English and whose second language was Korean. This secondary translator was an independent translator with no prior knowledge of the questionnaire. The focus of this translation was on conceptual and cultural identity rather than linguistic identity. The final translation was completed after examining the sentence structure and similarity while comparing the reverse translation result with the original tool.

Pilot test. A pilot study of the final draft was performed with four Korean-speaking nurses in a critical care unit, who were not included in the validation sample, in order to assess the comprehension and suitability of the questionnaire and review the fluency, readability, and comprehensibility of its items. No major difficulties were reported by the critical care nurses. The respondents completed the questionnaires in about 3–5 minutes. Minor revisions were made to the Korean version of the MIS (K-MIS) without any change in the conceptual meanings, and this resulted in the final version of the K-MIS questionnaire.

Data analysis

IBM SPSS Statistics Version 26.0 & AMOS Version 23.0 was used for the analyses. Descriptive statistics were used to summarize the data. Internal consistency was estimated using Cronbach's α . Construct validity was examined via an EFA and CFA. The Kaiser–Meyer–Olkin (KMO) test and the Bartlett's test of sphericity were used to ensure data adequacy for the factor analyses. EFA was extracted through the common factor analysis with direct oblimin. CFA was conducted to evaluate the factor structure for adequate model fit with multiple fit indices. A range of goodness-of-fit criteria to assess overall model fit were used, including goodness-of-fit index (GFI) > 0.95, root mean square error of approximation (RMSEA) < 0.06, Tucker-Lewis index (TLI) > 0.95, and CFI > 0.95 (Hu & Bentler, 1999). Additionally, the convergent validity was estimated by examining Pearson correlations between the Korean version of the MIS and authentic leadership. All tests were performed at a $p = .05$ statistical significance level.

Results

Demographic data

A total of 207 ICU nurses were included in this study. Demographic data are shown in Table 1. The participants' average age was 29.9 ± 6.25 years, and 201 (97.1%) were female and 6 (2.9%) were male. The most prevalent characteristic in each category was as follows: Bachelor's degrees, 154 (74.4%); unmarried, 143 (69.1%); religious, 140 (67.6%); less than 3 years of total career work, 70 (33.8%).

Construct validity

In this study, factor analysis was performed according to the classical theory test in order to verify construct validity, which means whether or not the tool measures abstracted constructive concepts well. Unlike the original research tool, this study was conducted on nurses in ICU in Korea. As participants' response to the measuring tools may vary depending on the characteristics, circumstances, and cultural differences of the survey target, an EFA was first conducted to create an appropriate model or structure by searching for the characteristics inherent in the data without any special assumptions about the number or structure of the factors of the tool (Pett et al., 2003). To secure cross validation, the subjects of the EFA and CFA were differently distributed. The EFA included 103 subjects randomly extracted by generating random numbers using SPSS programs among 207 subjects. In order to evaluate the suitability of EFA before analysis, KMO and Bartlett's test of sphericity were checked. The KMO fit index of 0.81 and Bartlett's test of sphericity confirmed that the factor structure was a good fit with the data (Approx $\chi^2 = 472.822$, $df = 45$, $p < .001$) (Andy, 2013). Two factors were extracted, with an Eigen value greater than 1.00 and a factor loading value greater than .4 after a common factor analysis with direct oblimin (Andy, 2013). The factor consists of six items (1, 2, 3, 7, 8, 9, and 10) tapping the degree to which respondents prefer the characteristics of moral behavior, and this is called "Preference". The second factor consists of two items (4, 5, and 6) tapping the degree to which respondents indirectly express their moral characteristics, and this is called "Preference". The two extracted factors explained 52.17% of the total variance in the MIS. In the case of item 6, a reliability analysis was conducted due to cross factor loading. When item 6 was put in factor 2, the Cronbach's α was higher at .645, so it was finally incorporated into factor 2 (indirectness) (Table 2).

The CFA was conducted to determine construct validity using a structural equation model after performing EFA using a different sample (Table 3). Item 8 of "preference" and item 4 of "indirectness" were deleted from Model 1 as their standardized estimates (β) were low at .17 and .01, respectively. The standardized estimates (β) for the remaining eight items, excluding item 4 and 8, were .46 to .82, and met the minimum criteria (Kline, 2015). To verify the reliability and validity of K-MIS, the critical ratio (CR) of the non-standardized lambda (λ) value was evaluated and found to be in the range of 3.921 to 7.977 at the significance level $\alpha = .05$, satisfying the analysis conditions of 1.96 or higher in Model 2. Therefore, goodness-of-fit was examined for Model 2, and the model fit index was RMSEA = .113, GFI = .902, TLI = .847, CFI = .896.

In this study, the RMSEA and TLI values of Model 2 did not meet the criteria, so a modified Model 3 was constructed by applying a modification index (MI) to increase the model fit (Figure 1). The resulting fitness indices were RMSEA = .076, GFI = .937, TLI = .93, CFI = .955, which accepted all the criteria (Table 3). To confirm the validity of the composition concept of this tool, the convergent validity and discriminant validity of the items were verified. Table 4 shows the results of the convergent validity of K-MIS under three conditions.

First, the standardized factor load (estimate, β) for all items was .45~.82, satisfying .5 or more. Second, the average variance extracted (AVE) value was .4~.5, which can be said to satisfy the standard of .5 or higher. Third, the construct reliability (CR) value was .63~.65, which can be said to satisfy the standard of .7 or higher. Therefore, K-MIS satisfies three conditions, and the intensive validity of the question was confirmed.

Two conditions were checked to verify the discriminant validity of this tool. First, the squared value (ρ^2) of the correlation coefficient of all factors was .27, which was less than the AVE value, so the first condition was satisfied. Second, the standard error $X^2 + \text{correlation coefficient} = .024$ and standard error $X^2 - \text{correlation coefficient} = .78$. Thus, the condition that “standard error $X^2 \pm \text{correlation coefficient}$ ” must not include 1 was satisfied.

Convergent validity

In order to verify the convergent validity of the construct validity, the correlation between authentic leadership and moral identity was analyzed for 207 people. ALI had a correlation with moral identity in a previous study (Olsen & Espevik, 2017). As a result, there was a significant positive correlation ($r = .203, p = .003$) between K-MIS and authentic leadership.

K-MIS reliability test

The reliability Cronbach's α value for all 8 questions in the Korean version of MIS was .705. Also, Cronbach's α value for each sub-factor was “preference” .58 and “indirectness” .79.

Discussion

In Korea, intensive care nurses frequently experience various ethical conflicts, such as human dignity versus unnecessary medical treatments, the compulsory application of restraints for treatment, suffering resulting from a lack of moral sensitivity, dilemmas resulting from nurses' limited autonomy in treatments, and conflicts with physicians or institutional policy (Choe et al., 2015). In these circumstances, the nurse is obligated to act morally. Aquino & Reed developed a moral identity tool that measures when and why people act on human welfare to understand the motives of moral behavior (Aquino, & Reed, 2002). According to Aquino & Reed, the higher the moral identity, the higher the likelihood of engaging in moral acts (e.g., donation behavior) (Aquino, & Reed, 2002). Therefore, this study aims to

evaluate the validity and reliability of the Korean version of MIS (K-MIS) in order to identify the elements of moral identity that promote work ethics.

There may be cultural differences in understanding the moral identity of Western and Korean nurses. Therefore, it was important to first evaluate how Korean ICU nurses respond to the MIS. Second, it was necessary to investigate the pattern to see if a new subscale should be created. Therefore, EFA was first conducted to confirm the factor structure of K-MIS, which showed that the factor loadings of each item representing moral identity were all over .40. The item 6 had cross factor loading, when item 6 was put in factor 2, the Cronbach's α was higher at .645, so it was finally incorporated into factor 2 (indirectness).

In this study, as in the original MIS tool, it consisted of two factors, but the items that constitute these factors were different. The reason for this difference appears to be the difference in the EFA methods. At the time of development of the tool, EFA principal-components analysis with varimax rotation was performed. Principal-components analysis is a method mainly dealt with in the natural sciences because it does not include an error term. However, this study is in the field of social science. Since common factor analysis includes error terms as appropriate, common factor analysis with direct oblimin was performed in this study. This difference in analysis methods may have engendered the different results of the items constituting each factor.

Based on these results, a CFA was performed with a sample different from the one subjected to EFA. Models for latent variables and items were established to verify the fit of the model, but the criteria were not met. In addition, the standardized estimates of items 4 and 8 were .01 and .17, respectively, which did not satisfy the standard value of .40. This difference is believed to be due to cultural differences between Korea and the West. Item 4 is "I would be ashamed to be a person who had these characteristics." Confucianism is one of the most influential social cultures in Korea and has more influence on the lifestyle of the people than any other religion (Ha, 2018). Confucianism teaches that human destiny can be improved by exercising moral principles (Ha, 2018). In particular, in the Confucian culture of Korea, regards morality as important enough to employ moral education as part of educational activities in official subjects or school environments (Han et al., 2018). Therefore, there is no shame in having moral characteristics in the Korean culture. Rather, Korean society expects people to act morally. Therefore, due to such cultural differences, item 4 was deleted because it was thought to have a relatively low impact compared to other questions. Item 8, which stated "The fact that I have these characteristics is communicated to others by my membership in certain organizations," also revealed low standardized estimates. The original tool targeted college students who are members of specific organizations that perform various activities. However, in the case of this study, it was thought that it had a relatively low effect because it was targeted at Korean nurses who are already affiliated with an organization called the ICU, so it was deleted. Therefore, K-MIS was constructed with the final 2 factors, a total of 8 items.

Accordingly, CFA was performed with 8 items, and as a result of calculating and analyzing the AVE, the convergent and discrimination validity of the items were also secured. As a result, it was confirmed that 6 items of factor 1, and 2 questions of factor 2, were appropriate to measure each corresponding factor

and were clearly distinguished from the questions included in other factors. In conclusion, it was judged that the construct validity of the eight items comprising the two factors constituting moral identity was secured.

To verify the convergent validity of the tool, the relationship with MIS was analyzed by setting authentic leadership, a variable correlated with MIS in previous studies, as the golden standard (Olsen & Espevik, 2017). Authentic leadership is a concept that values morality as a leader (Neider & Schriesheim, 2011). As a result of analyzing the correlation between the two variables, K-MIS had a significant positive correlation with "authentic leadership." This result can be said to mean that the convergence validity of this tool has been secured.

Finally, as a result of measuring the internal consistency of the tool, the reliability of K-MIS was .67, and the reliability of factors was .54~.73. The overall reliability of the original tool MIS is unknown because it was not reported, but the factor was .76~.77, and the reliability of K-MIS was slightly lower than that of the original tool. In general, when the number of items is small, Cronbach's α value tends to be low. In this study, as two questions were deleted, reliability was measured with the only eight questions. Therefore, it is thought that the reliability may be reduced because the number of items is small, but the overall reliability of the tool was high.

K-MIS is a useful tool to measure the moral identity of nurses in ICU in Korea. It has educational significance in that it is a measurement tool that has secured validity and reliability for developing moral improvement training program for nurses in the Korean intensive care unit and evaluating its effectiveness. In addition, this tool can be effectively used by ICU nurses to recognize their own moral identity, which is thought to contribute to nursing practice.

Limitations

This study has some limitations. Since moral identity is influenced by individual temperament variables such as the personality characteristics of the participants, repeated studies with various subjects and situations are needed. In addition, this study has a limitation in generalizing the research results because data was collected through convenient sampling of ICU nurses. Therefore, it is necessary to repeat the research with an expanded sample size.

Conclusion

This study adapted the MIS developed by Aquino and Reed (Aquino & Reed, 2002) to develop the K-MIS, according to the WHO's tool translation procedure. Although the overall factor structure of all the items is slightly different from that of the original MIS, it can be judged that the validity of the tool is secured as it is shown to explain each factor well. Reliability was also secured by checking the internal consistency of the tool. Therefore, it is expected that the completed K-MIS will contribute to revitalizing the research on the moral identity of nurses in Korean ICUs.

Abbreviations

ICU: intensive care unit; MIS: moral identity scale; K-MIS: korean version of the moral identity scale; EFA: exploratory factor analysis; CFA: confirmatory factor analysis; ALI: authentic leadership inventory; KMO: Kaiser–Meyer–Olkin; GFI: goodness-of-fit index; RMSEA: root mean square error of approximation; TLI: Tucker-Lewis index; CFI: comparative fit index; AVE: average variance extracted; CR: construct reliability

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Ethics Committee of the K University (****-***), according to the ethical guidelines established by the Helsinki Declaration in 2008. All participants were informed about the project and provided informed consent by completing and submitting all the questionnaires. The critical care nurses were informed that participation in the study was voluntary. They were also told that their answers would be anonymous and confidential and would not be used for any other purpose than this study.

Consent for publication

Not applicable.

Availability of data and material

The datasets generated and/or analysed during the current study are not publicly available due [Including sensitive information of participants.] but are available from the corresponding author on reasonable request. Contact: asansong@knu.ac.kr

Competing interests

No competing interests.

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Authors' contributions

All authors have read and approved the manuscript. LJH: Substantial contribution to the design of the study and data collection, conducting the analysis and interpretation of data, drafting the manuscript and substantively revising it. Read and approved the submitted version and agreed to be personally accountable for the submitted work. SYS: Substantial contribution to the design of the study, contributing to the analysis and interpretation of data, contributing to drafting the manuscript and revising it. Read and approved the submitted version and agreed to be personally accountable for the submitted work.

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Conflict of interest statement

All authors declare no conflict interest

Ethical considerations

This study was reviewed and approved by the Ethics Committee of Kyungpook National University (IRB NO. 2016-105).

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Tables

Table 1. Characteristics of Participants

Characteristics	Categories	Total (N=207)	Participants for EFA (n=103)	Participants for CFA (n=104)	t or χ^2	P
		n (%) or M±SD	n (%) or M±SD	n (%) or M±SD		
Age (year)		29.9±6.25	29.91±6.29	29.88±6.24		
Gender	Female	201(97.1)	99(96.1)	102(98.1)	0.71	.401
	Male	6(2.9)	4(3.9)	2(1.9)		
Education (degree)	Associate	37(17.9)	20(19.4)	17(16.3)	0.51	.773
	Bachelor	154(74.4)	76(73.8)	78(75)		
	Master	16(7.7)	7(6.8)	9(8.7)		
Marital status	Married	64(30.9)	31(30.1)	33(31.7)	0.07	.799
	Single	143(69.1)	72(69.9)	71(68.3)		
Religion	Have	67(32.4)	32(31.1)	35(33.6)	0.16	.984
	Have not	140(67.6)	71(68.9)	69(66.4)		
Working unit	MICU	30(14.5)	20(19.4)	10(9.6)	5.35	.617
	CICU	22(10.6)	9(8.7)	13(12.5)		
	SU	11(5.3)	5(4.9)	6(5.8)		
	SICU	32(15.5)	15(14.6)	17(16.3)		
	CSICU	18(8.7)	10(9.7)	8(7.7)		
	NSICU	17(8.2)	7(6.8)	10(9.6)		
	etc*	77(37.2)	37(35.9)	40(38.5)		
Career of work (year)	< 3	70(33.8)	38(36.9)	32(30.8)	2.56	.465
	≥3	31(15.0)	15(14.6)	16(15.4)		
	≥5	60(29.0)	25(24.3)	35(33.7)		
	≥ 10	46(22.2)	25(24.3)	21(20.2)		

Note. *TICU: trauma intensive care unit; NICU: neonatal intensive care unit; EICU: emergency intensive care unit.

Table 2. Result of Exploratory Factor Analysis of K-MIS (N=103)

Factor-Item no.	Moral Identity Scale		
	M±SD	Factor	
		1	2
Item 1	5.53±1.05	.898	-.220
Item 10	4.54±1.26	.810	-.055
Item 2	5.12±1.17	.798	-.016
Item 9	3.85±1.11	.663	.232
Item 8	4.23±.97	.591	.263
Item 7	3.31±1.21	-.459	.096
Item 3	4.23±1.21	.413	.065
Item 5	3.60±1.16	.371	.757
Item 6	3.58±1.19	.481	.616
Item 4	2.34±1.21	-.289	.468
Eigen value		4.474	1.629
Variance explained (%) variance(%)		40.414	11.759
Total variance explained (%)		40.414	52.173
Kaiser-Meyer-Olkin (KMO)	0.81		
Bartlett's test of sphericity	$\chi^2 = 472.82$	df = 45	$p < .001$

Note. Factor 1: preference; Factor 2: indirectness; df: degree of freedom; Factor loading > .4.

Table 3. Goodness-of-Fit for Comparative of the Korean Version-Moral Identity Scale

Fitness index	Absolute fit index					Incremental fit index	
	$\chi^2 (p)$	df	CMIN/df	RMSEA	GFI	TLI	CFI
Model 1	98.001 (<.001)	34	2.882	.135	.831	.697	.771
Model 2	43.952 (=.001)	19	2.313	.113	.902	.847	.896
Model 3	28.822 (=.051)	18	1.601	.076	.937	.93	.955
Original 2 factor model (n=210) ⁷	77.88 (p<.001)	-	-	-	.93	.88	.93
Hu & Bentler ²⁴			2:1 or 3:1	<.06	>.95	>.95	>.95

Note. df: degree of freedom; RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual; GFI: goodness of fit index; TLI: Tucker-Lewis index; CFI: comparative fit index.

Model 1: Korean version Moral Identity Scale (10 items-original model). Model 2: Korean version Moral Identity Scale (8 items-deleted two item). Model 3: modified model of the model 2.

Table 4. Confirmatory Factor Analysis of K-MIS

Factors	Item	Standardized estimates	SE	Factors		p	AVE	CR
				1 (r)	2 (r)			
1	1	.681	0.77	1		<.001	0.361	0.632
	2	.822	0.47		<.001			
	3	.446	0.85		<.001			
	7	-.488	0.93		<.001			
	9	.448	0.71		<.001			
	10	.798	0.53		<.001			
2	5	.714	0.58	.508	1	<.001	0.487	0.655
	6	.766	0.58	<.001				

Note. K-MIS: Korean Moral Identity Scale; Factor 1: preference; Factor 2: indirectness

Figures

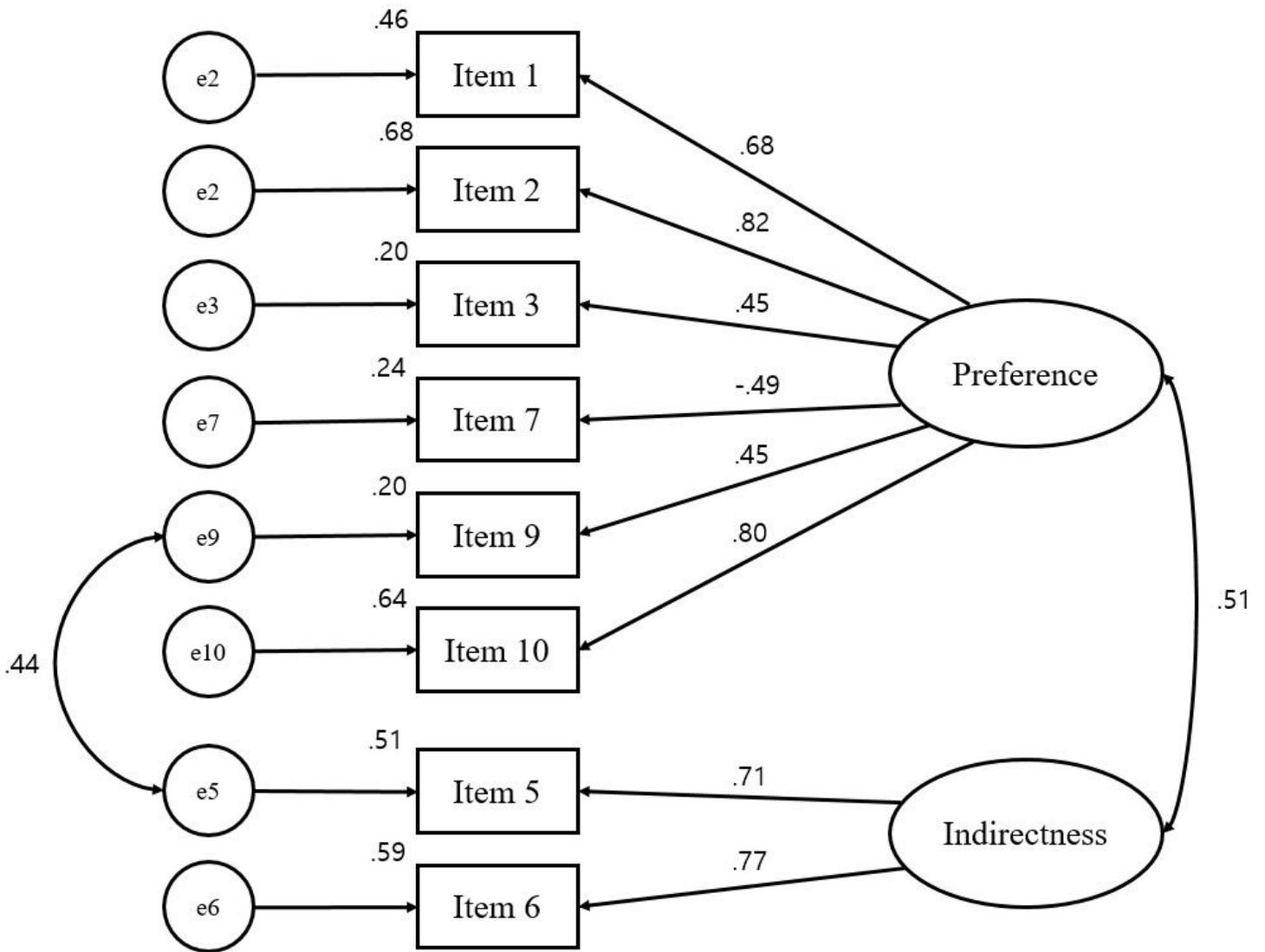


Figure 1

The two-factor structure of the Korean version of 8-item Moral Identity Scale.