Psychometric Properties of the Korean Version of the Nursing Profession Self-Efficacy Scale

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ABSTRACT

Background: Self-efficacy in the nursing profession has been reported to have a positive effect on personal performance in terms of clinical performance and decision-making abilities, nursing performance, professional intuition, organizational commitment, and turnover intention.

Purpose: The purpose of this study was to verify the validity and reliability of the Korean version of the Nursing Profession Self-Efficacy Scale (K-NPSES).

Methods: This methodological study used questionnaires collected from 307 nurses at medical institutions in South Korea. The content validity of the questionnaire was verified using the averaging method, whereas the criterion-related validity was evaluated by calculating the correlation with the Sherer General Self-Efficacy Scale. The construct validity was determined by analyzing the explanatory and confirmatory factors. Reliability was verified using Cronbach’s α and test-retest by calculating intraclass correlation coefficients.

Results: The content validity index of the K-NPSES was found to be greater than .95, and the criterion-related validity was satisfactory (coefficient = .57, p < .001). The original Nursing Profession Self-Efficacy Scale has two subfactors, and the K-NPSES analyzed in this study has four subfactors. The data were appropriate for factor analysis using Kaiser–Meyer–Olkin (.87) and Bartlett’s sphericity test (χ² = 1236.01, df = 137, p < .001). The model fit was acceptable (normed chi-square χ²/df = 2.22, root mean square residual = .05, root mean square error of approximation = .09, comparative fit index = .88, Tucker–Lewis index = .86, goodness-of-fit index = .83). Regarding reliability, Cronbach’s α was .91 and the intraclass correlation coefficient was .78 (p < .001).

Conclusions/Implications for Practice: The findings of this study confirmed the K-NPSES as having acceptable validity. In addition to predicting nursing clinical performance, a well-established nursing profession self-efficacy scale may be used to improve the quality of clinical nursing.

Key Words: nursing profession self-efficacy, reliability, validity, Korean version.

Introduction

Hospitals are heterogeneous, complex, and highly coordinated and interdependent in terms of its departments and members (Lu et al., 2019). In particular, nurses provide services in cooperation with other medical professionals and are at the forefront of healthcare provider contact with patients and families. In addition, nurses account for a large percentage of the hospital organization. Thus, improving the quality of nursing services is directly related to the productivity of the hospital (Needleman et al., 2020). As patients and social demands increase, nurses must cultivate professional knowledge and skills with a solid nursing philosophy and fulfill their moral obligations to provide quality nursing care.

Self-efficacy, an internal characteristic of individuals, is the belief in the ability to organize and carry out the actions and processes necessary to achieve one’s goals (Bandura, 1986). According to Bandura, self-efficacy is the belief that one can successfully perform a particular action in a particular situation (Bandura, 2006). In addition, individuals may accomplish more than what their abilities allow by having flexible self-efficacy or by using their skills productively when faced with force majeure obstacles. People with high self-efficacy are more likely to try and sustain an action. Moreover, Rees et al. (2015) also mentioned that self-efficacy is a significant individual psychological factor that should be considered in the workforce resilience model. It has been proposed that self-efficacy may directly or indirectly influence an individual’s mental health and affect psychological resilience via, for example, the frequency and severity of burnout (Liu & Aungsuroch, 2019). In the field of nursing, self-efficacy affects the motivation of and change in individual nurses’ activities and is a driving force for research (O’Halloran et al., 1996). Nurses with a high rate of self-efficacy are able to provide high-quality nursing through successful work performance, improved individual and organizational performance (J. Chen et al., 2020), and strong attachment to their departments (De Simone et al., 2018; Han, 2016). Thus, self-efficacy in the nursing profession

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has been reported to have a positive effect on personal performance (e.g., clinical performance ability; Park & Ju, 2016) and the ability to solve complex situations (Falk-Brynhildsen et al., 2019) as well as individual motivation (Zareipour et al., 2020), organizational commitment, nursing performance (De Simone et al., 2018), and turnover intention (Chegini et al., 2019). Therefore, it is necessary to measure self-efficacy in a manner that reflects the specificity of the nursing profession or the means by which a characteristic emphasizes the ethical values associated with existential well-being, behavioral categories, and norms based on humanism. In recent decades, ethical conflicts have increased in the field of nursing because of the rising complexity of care and scientific and technological advancements. In addition, factors such as the dynamic nature of the work environment, including the lack of complete involvement of nurses in the decision-making process, moral disagreements between doctors and nurses about certain decisions or practices, lack of time to provide high-quality critical care, and difficulties in agreeing on issues of a bioethical nature (Azoulay et al., 2009; Falcó-Pegueroles et al., 2016), have exacerbated the prevalence of ethical conflicts (Pishgoote et al., 2019). In these situations, nurses must make and take responsibility for their own decisions. Thus, nursing ethics has been increasingly emphasized. This ethical value differentiates the nursing profession from other occupations.

Many researchers have used the Sherer General Self-Efficacy Scale (SGSES) to measure self-efficacy in nurses (Y. Kim & Kang, 2015; Moon, 2016; Oh & Wee, 2016; Park & Ju, 2016; Sherer et al., 1982). However, each study used a different translation process for the SGSES, and there were studies in which the translated tools were arbitrarily modified or selected by the researcher. Bandura and Chen explained the difference between general self-efficacy (GSE) and specific self-efficacy (SSE; Bandura, 1986; G. Chen et al., 2001). Although both GSE and SSE denote beliefs about one’s ability to achieve desired outcomes, the underlying constructs differ in scope (i.e., general/specific) of the performance domain contemplated. Therefore, GSE and SSE share similar antecedents (e.g., actual experience, vicarious experience, verbal persuasion, and psychological states; Bandura, 1986). However, GSE, which has been defined as “one’s belief in one’s overall competence to effect requisite performances across a wide variety of achievement situations,” is much more resistant to ephemeral influences than SSE, as SSE is a motivational state and GSE is a motivational trait. In addition, SSE varies according to specific area, task, and activity area, and it may increase performance motivation and result prediction (Bandura, 1986). Therefore, if one wants to measure the work-based self-efficacy of an individual, a scale that reflects job characteristics should be used for more accurate results. The Nursing Profession Self-Efficacy Scale (NPSES) was originally developed in Italy by Caruso and is organized based on Bandura’s theory of social cognition (Caruso et al., 2016). The NPSES is a professional measure that includes scientific evidence-based knowledge and skills, ethical values, and effective relationships and cooperation with peers depending on patient and social needs. Accurate outcomes have been successfully predicted using this scale for individual ability and likelihood (Caruso et al., 2016).

**Purpose of the Study**

This study was designed to verify the validity and reliability of the Korean NPSES (K-NPSES), which was translated from the original NPSES. The results are expected to confirm the validity of this tool in terms of predicting the ability of nurses to effectively cope with the daily work and various professional situations.

**Methods**

**Study Design**

A methodological approach was used to verify the validity and reliability of the K-NPSES.

**Setting and Samples**

Nurses working in medical institutions with 300 or more beds in Munkyung City (Gyeongsangbuk-do Province), Chungju City (Chungcheongbuk-do Province), and Busan Metropolitan City in South Korea were recruited as participants from November 2017 to January 2018 using convenience sampling. The inclusion criteria were as follows: (a) having 3–16 years of clinical experience, (b) being a nurse shift worker, and (c) signing informed consent to participate. Otherwise, qualified nurses working in central supply and outpatient rooms as well as those who worked in administrative nursing positions were excluded because their working conditions, environment, and circumstances may differ and affect their responses on the NPSES.

The optimal sample size for factor analysis was determined using the maximum likelihood method, which recommends optimal sample sizes of 120–400 as the basis for the n:p ratios (the ratio of the number of cases to the measured variable) of 20:1 and 10:1 (Mitchell, 2001; Woo, 2012). As the number of items was 19 in this study, a sample of 190–380 participants was identified as the optimal sample size. Three hundred sixty-seven nurses who met the inclusion criteria were recruited. Sixty were later excluded because of incomplete questionnaires, leaving a final sample of 307 participants, which was adequate for conducting the factor analysis.

**Measures**

The NPSES was used in this study to measure nursing professional self-efficacy. The scale consists of 19 questions that measure attributes of caring (12 items) and professional (seven items) situations. The NPSES requires respondents to indicate their degree of agreement with each item using a 5-point Likert scale ranging from 1 (completely no confidence) to 5 (complete confidence). The total scale score ranges from 19 to 95, with higher scores indicating higher
self-efficacy. The internal consistency of the original scale was Cronbach’s $\alpha = .83$.

The Korean version of the SGSES (Jung, 2007) was used to assess the concurrent validity of the scale. The SGSES is one of the most reputable scales currently available to assess the general set of expectations that an individual applies to new situations (Sherer et al., 1982). The SGSES has been translated into Chinese, Korean, Turkish, Arabic, and Persian, among other languages, and has been used in over 100 published studies. This scale consists of 17 questions that are answered using a 5-point Likert scale. The total scale score ranges from 17 to 85, with higher scores indicating higher GSE. The internal consistency of the SGSES was Cronbach’s $\alpha = .86$ for the original version and Cronbach’s $\alpha = .94$ for the Korean version.

The demographic data on the participants, including gender, age, marital status, religion, educational level, educational background, total work experience, current department career, working department, work type, and monthly income, were collected.

**Ethical Considerations**

The Research and Ethics Committee of Kyung Hee University approved this study (KHSIRB-17-083). First, the purpose of this study was explained to the head of the nursing department of each hospital. Then, permission was obtained from each hospital to conduct the study. In addition, data were collected after explaining to the eligible participants the study purpose and procedures, the research method, the research strengths and weaknesses, the rewards and anonymity provisions, and the possibility of participation or discontinuation of the study. Participants were then asked to read and sign the consent form.

**Data Collection**

**Translation process and content validity**

This study proceeded after receiving permission from the scale’s original developers, Caruso et al. (2016), to translate the NPSES into Korean. The scale was translated from English to Korean in accordance with the World Health Organization’s (2017) process of translation and adaptation of instruments by one of the authors of this study who is a bilingual professor of nursing. The translation was then reviewed by an international medical interpreter and a medical professional, each of who had lived in English-speaking countries for over 15 years. They provided feedback on the expressions and clarity of the Korean translation and evaluated suitability. Next, 10 nurses, each with over 5 years of experience, confirmed their understanding of the items of the scale and identified questions that required correction to address cultural differences. Subsequently, the back-translation was performed by an English-speaking medical interpreter, and the similarities between the original text and the back-translation were evaluated by two individuals who were not Korean and who spoke English as their native language.

The content validity of the K-NPSES was confirmed by six experts (four head nurses and two team leaders) using the content validity index (CVI) to check for relevance and clarity. Lynn (1986) provided widely cited guidelines for what an acceptable item-level content validity (CVI) should be in relation to the number of experts. She advocated for permitting a modest level of disagreement when more than five experts were involved (e.g., when there are six experts, the CVI must be at least .83, reflecting the disagreement of one expert). Each item was standardized as follows: 1 = “Not valid,” 2 = “Cannot evaluate validity without editing the item or need editing as the item is not valid,” 3 = “Valid but needs some editing,” and 4 = “Valid and clear.” The scale-level CVI/average method was calculated according to the proportion of items that were rated as a 3 or 4 by the experts (Polit et al., 2007).

**Pilot study**

A pilot study was conducted on 20 nurses who had at least 3 years of clinical experience and who were not included in the study sample. Input from these 20 nurses was used to further modify the survey. Some participants in the pilot study indicated that the meaning of Items 2 (“Social safety”), 6 (“Ethical counseling”), and 19 (“Regulatory authority/body”) may be inferred from their wording but difficult to understand clearly. “Social safety” was interpreted as the use of psychological counseling techniques to address the ethical dilemmas that may arise while providing care. “Regulator authority/body” was interpreted as the authorities and organizations relevant to the problems encountered, including the Ministry of Health and Welfare, the heads of departments, and the departments. The authors agreed that most of the participants understood the items similarly and that accurately answering each item was not a problem. In addition, the authors further assessed and reflected on the appropriateness of the survey response time and format.

**Data collection**

Data were collected from November 2017 to January 2018. The questionnaires and written informed consent form for each hospital were distributed in person or by mail. The study included only those participants who provided written informed consent. The average completion time for the questionnaire was 20 minutes. After completing the questionnaire, a penlight was given to the participants as a thank-you gift.

**Data Analysis**

Data collected for this study were analyzed using the SPSS 22.0 (the SPSS Korea Data Solution, Seoul, South Korea) and AMOS 20.0 (IBM Inc., Armonk, NY, USA). The 307 participants were divided into two random groups, with 137 assigned to the exploratory factor analysis group and
170 assigned to the confirmatory analysis group. There were no significant differences between the two randomly split samples in terms of demographic characteristics and outcomes.

An exploratory factor analysis was conducted to verify construct validity, whereas Kaiser–Meyer–Olkin and Bartlett's sphericity tests were conducted to verify whether the data were appropriate for factor analysis. Principal component analysis and varimax rotation were used to extract the factors. An additional analysis was conducted to confirm the correlation between the whole item and the subcomponents based on the results of the factor analysis. The fit indices of the model were calculated using confirmatory factor analysis. In general, a $\chi^2/df$ ratio between 2 and 5 should be used and is considered acceptable even when the sample size is small; however, a comparative fit index (CFI) is less affected by sample size than the $\chi^2/df$ ratio. If the fit index is at least .70 (preferably .90 or higher), it is considered acceptable (Kang, 2013a). The goodness-of-fit index (GFI) is one of the oldest fit indices, and a value of .90 or higher indicates a good model fit (Kang, 2013a). However, as the model becomes more complex, the likelihood of the GFI being affected by the sample size increases (Kang, 2013a, 2013b). The Tucker–Lewis index (TLI) is not affected by the sample size, but its simplicity must be considered when assessing suitability, with a value of > .90 considered suitable (Kang, 2013b). The root mean square residual (RMR) is the average of all standardized residuals to test closeness of fit in ordinal factor analysis, with a good fit model earning an RMR value below .05 (Shi et al., 2020). The root mean square error of approximation (RMSEA) is a recently developed, commonly used index, with < .05 considered a very good fit index, .05–.08 considered a good fit, .08–.10 considered an adequate fit, and any value higher than .10 considered a poor fit (Hair et al., 2010).

A correlation analysis was performed between the SGSES and the tool revised and supplemented by Jung (2007) to verify the criterion-related validity. Correlation coefficients were classified as minimally significant at ±.30, moderately significant at ±.40, and substantially significant at ±.50 (Hair et al., 2010).

The Cronbach’s $\alpha$ for each item’s internal consistency was calculated to verify the validity of each subcomponent. Typically, the Cronbach’s $\alpha$ coefficient is interpreted as “confident” when > .90, “normal” when > .80, “acceptable” when > .70, and “low” when > .60. Thus, reliability is typically confirmed at > .70 for new instruments and > .80 for established instruments (Polit & Beck, 2016). The intraclass correlation coefficients (ICCs) were used to verify test–retest reliability. ICC values range from 0 to 1, with low levels considered as < .50, acceptable levels as .50–.75, confident levels as .75–.90, and perfect levels as > .90 (Tang et al., 2019).

## Results

### Demographic Characteristics of Participants

The mean age of the participants in this study was 30.54 (SD = 5.64) years. Most (292, 95.1%) were women, 200 (65.1%) were unmarried, 90 (29.3%) were religious, 66 (21.5%) held a 2- to 3-year college degree, and 241 (78.5%) held a 4-year university degree. The mean career and length in the current department of participants were 7.11 (SD = 4.63) years and 4.30 (SD = 3.03) years, respectively. Numbers of participants in the internal medicine, surgery, intensive care unit, emergency room, and “other” departments (i.e., pediatrics, gynecology, otolaryngology, and oriental hospitals) were 135 (44%), 94 (30.6%), 22 (7.2%), 10 (3.3%), and 46 (15.0%), respectively. Moreover, 53 (17.3%) currently worked in departments with integrated nursing and care services, 260 (84.7%) currently worked a three-shift cycle (8 hours of work, e.g., 07:00–15:00, 14:30–22:30, 22:30–07:30), and 125 (40.7%) earned South Korean won 2.5–3 million/month.

### Validity

#### Content validity

The content validity of the K-NPSES was confirmed by calculating the scale-level CVI/average based on the proportion of scores of 3 or 4 that were given by the experts out of all the items (Polit et al., 2007). In this study, content validity was verified using a scale CVI value of .95.

#### Criterion-related validity

The criterion-related validity of the K-NPSES was evaluated by examining the correlation with the SGSES, with results showing the K-NPSES having good criterion-related validity (validity correlation = .57 [p < .001]).

#### Construct validity

The exploratory factor analysis showed that the data were appropriate for factor analysis using Kaiser–Meyer–Olkin (0.87) and Bartlett’s sphericity test ($\chi^2 = 1236.01, df = 137, p < .001$). Afterward, principal component analysis was selected as the method for extracting the factors, and exploratory factor analysis was conducted using the first sample (N = 137) with a varimax factor rotation. The carrying capacity of each factor was less than .40, with a minimum of .45 and a maximum of .85.

Considering the significant differences between the nursing environments in Italy and Korea, four new subcomponent factors in the K-NPSES were added, referencing the job descriptions from the author’s workplace, code for nurses, ethical concepts applied to nursing, and prior studies related to the nursing field and practice (Fero et al., 2009; Jeong, 2017). These factors were “nursing practice situations (self-efficacy associated with caring for the patient),” “nursing ethics situations (self-efficacy related to ethical situations in the nursing field),” “integrated nursing situations (self-efficacy associated with practicing integrated care),” and “nursing cooperation situations (self-efficacy associated with collaborating with colleagues and healthcare professionals),” named Factors 1–4, respectively. Factor 1 explained 37.0% of the...
total variance with five items, Factor 2 explained 11.5% of the variance with five items, Factor 3 explained 8.3% of the variance with six items, and Factor 4 explained 6.09% of the variance with three items, giving an accumulated explanatory power of 62.92% (see Table 1). An evaluation of the model goodness of fit for the 19 items of the K-NPSES is shown in Table 1.

### Table 1

**Exploratory and Confirmatory Factor Analyses of K-NPSES**

| Item: Considering a Typical Working Situation, I Can– | Factor Loading (Exp.) | Factor Loading (Con.) | Estimate | SE | CR |
|-------------------------------------------------|-----------------------|----------------------|---------|----|----|
| Factor 1: nursing practice situation (P)         |                       |                      |         |    |    |
| 2 Ensure the health and safety of the society.  | .71                   | .73*                 | 3.37    | .05| 63.23 |
| 8 Review quality (accuracy/completion) of clinical records. | .68                   | .98*                 | 3.47    | .06| 62.58 |
| 4 Provide healthcare services for individuals without discrimination and prejudice, based on the principle of equity. | .67                   | .76*                 | 3.48    | .05| 65.01 |
| 1 Respect patients and their autonomy (freedom of choice, right to self-determination) | .65                   | .70*                 | 3.55    | .05| 72.84 |
| 3 Provide healthcare services based on professional standards, regardless of the situation. | .58                   | .81*                 | 3.35    | .05| 62.45 |
| Factor 2: nursing ethics situation (E)           |                       |                      |         |    |    |
| 10 Protect privacy and confidentiality rights of patients when handling information. | .85                   | .88*                 | 3.86    | .06| 69.48 |
| 11 Fairly use professional data (resource/information) without breaking the rules. | .82                   | .77*                 | 3.77    | .05| 77.47 |
| 7 Ensure confidentiality of work-related information. | .74                   | .78*                 | 3.78    | .06| 67.66 |
| 14 Ask for help from colleagues to evaluate certain situations and problems. | .65                   | .57*                 | 3.75    | .05| 71.86 |
| 9 Protect the legal and moral rights of patients. | .59                   | .83*                 | 3.69    | .05| 74.79 |
| Factor 3: integrated nursing situation (I)       |                       |                      |         |    |    |
| 13 Ensure that nursing practice is based on the latest scientific knowledge. | .74                   | .76*                 | 3.21    | .06| 58.58 |
| 12 Recognize and solve ethical/moral dilemmas and problems at work. | .70                   | .69*                 | 3.35    | .06| 60.30 |
| 15 Apply various research outcomes to clinical practice. | .68                   | .63*                 | 3.02    | .06| 48.02 |
| 16 Refuse to take part in a treatment that goes against professional values. | .68                   | .53*                 | 3.28    | .06| 53.93 |
| 5 Handle flaws and inefficiencies that may occur at the working facility. | .67                   | .67*                 | 2.91    | .06| 48.47 |
| 6 Use ethical counseling to solve ethical dilemmas related to nursing (care). | .45                   | .58*                 | 2.72    | .06| 43.06 |
| Factor 4: nursing cooperation situation (C)      |                       |                      |         |    |    |
| 18 Cooperate with nursing organizations to clarify nursing practice standards. | .82                   | .83*                 | 3.61    | .05| 70.77 |
| 17 Participate in nursing research.               | .77                   | .66*                 | 3.41    | .05| 62.62 |
| 19 Report any abusive or unethical behaviors of colleagues to respective regulation authority/agency. | .59                   | .39*                 | 3.07    | .06| 51.25 |

Note. Exp. = exploratory factor analysis; Con. = confirmatory factor analyses; SE = standard error; CR = critical ratio; K-NPSES = Korean version of the Nursing Profession Self-Efficacy Scale; P = nursing practice situation; E = nursing ethics situation; I = integrated nursing situation; C = nursing cooperation situation.

*p < .001.
Table 2

| Category | $\chi^2$ | $df$ | $\chi^2/df$ | RMR | RMSEA | CFI | TLI | GFI |
|----------|---------|------|-------------|-----|-------|-----|-----|-----|
| K-NPSES  | 323.67  | 146  | 2.22        | .05 | .09   | .88 | .86 | .83 |

Note: K-NPSES = Korean version of the Nursing Profession Self-Efficacy Scale; $df$ = degrees of freedom; RMR = root mean square residual; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; GFI = goodness-of-fit index.

Table 2. The model fit for the K-NPSES revealed that the fit indices for the CFI, TLI, and GFI were each slightly below .90. Thus, the RMR met the recommended index, and the RMSEA established the criteria as having a fair fit. As the results of the model goodness-of-fit test did not reveal a significant divergence from the general standards, the results were determined to be reasonable. The results of the standardized regression weights for the total items of the K-NPSES based on the confirmatory factor analysis are shown in Table 1. All of the items of the K-NPSES matched the condition of critical ratio $> 1.96$ ($p < .001$).

Reliability

The reliability of the internal consistency of the K-NPSES was Cronbach's $\alpha = .91$ (Table 3). The item-total correlations ranged from .38 to .80. To examine the stability of the scale, 20 participants were randomly selected from the sample, and a retest of the K-NPSES was administered after 4 weeks. Only 13 of the 20 participants could be evaluated for reliability because seven retest questionnaires were not returned. The ICC was .78 ($p < .001$), indicating that the test-retest reliability of the K-NPSES was acceptable in this study (Table 4).

Discussion

Because the working conditions of nurses may be affected by the unique medical and economic standards and cultural backgrounds of each country, the validity and reliability of the NPSES must be verified within the Korean context before use. Therefore, the validity and reliability of the K-NPSES in measuring self-efficacy for general tasks were tested in this study.

In comparing self-efficacy in nurses, it was found that GSE determined using the original tool (SGSES; $M = 3.42$, $SD = 0.50$) was slightly higher than nursing profession self-efficacy determined using the K-NPSES ($M = 3.3$, $SD = 0.43$). In addition, the results of the SGSES were found to be relatively higher than those reported in the studies of Chegini et al. (2019; $M = 3.55$, $SD = 0.45$), De Simone et al. (2018; $M = 3.71$, $SD = 0.47$), and M. Kim et al. (2019; $M = 3.56$, $SD = 0.48$), which may be attributed to the selection and exclusion criteria used in this study.

SGSES was selected to verify the criterion-related validity in comparison with the GSE scale because this scale has been used widely in past studies. The results showed a statistically meaningful and positive correlation between the K-NPSES and the SGSES, supporting that higher GSE correlates with higher nursing profession self-efficacy. G. Chen et al. (2001) stated that comprehensive self-efficacy helps explain motivation and performance in the context of various jobs, whereas GSE may be used to estimate specialized self-efficacy. However, Caruso et al. (2016) stated that an additional explanation is necessary to apply high levels of self-efficacy for everyday tasks to the self-efficacy required for specialized situations in the nursing profession. Moreover, De Smul et al. (2018) stated that estimating specialized self-efficacy requiring the consideration of specialized situations is difficult using the original self-efficacy tool. Therefore, to effectively measure self-efficacy in nurses, an additional scale is needed to assess related dimensions that are not addressed in the SGSES.

The subcomponent factors of the original NPSES developed by Caruso et al. (2016) include two factors that assess nursing "quality service" and "professional situations" and measure the tasks required to secure professionalism. However, this study identified four subcomponent factors in the K-NPSES. Differences in sample characteristics attributable to different nursing environments may account for the differences in factor structure. When a confirmatory factor analysis of the two-factor structure was implemented based on the original tool, the results partially matched the standards but generally showed a poor model fit ($\chi^2 = 647.30$, $p < .001$, $\chi^2/df = 4.29$, RMR = .05, RMSEA = .10, CFI = .81, TLI = .78, GFI = .80), which made it difficult to state definitively that the two factors were valid. Although the GFI may be improved by deleting items with low squared multiple correlations and factor capacity levels (Hair et al., 2010; Merenda, 1997) or by considering the modification index as statistical evidence (Choi & Ryu, 2016; Kang, 2013a), items from the original tool were not deleted. Therefore, the four factors in this study were chosen with finality. The model fit for the four factors revealed that the fit indices of CFI, TLI, and GFI were slightly less than .90 and that RMR met the recommended index and RMSEA established the criteria for having a fair fit. Although these results do not indicate a good fit in terms of the generally recommended GFI, researchers hold differing opinions regarding the evaluation criteria that should be included in this index (Hu & Bentler, 1998; MacCallum et al., 1996; Marsh et al., 2020). Thus, researchers should use multiple indices or choose the index that is most appropriate to their task depending on the context of the study (Kang, 2013b).

The advantages and disadvantages of each index have been argued and empirical criteria are recommended; however, this is not an absolute requirement (Marsh et al., 2020; Schermelleh-Engel et al., 2003). Researchers may consider deleting items or processing statistics to increase the goodness of fit of the model (Kang, 2013b;...
Merenda, 1997). However, the results of this study were derived while the overall structure of the tool was maintained to allow comparisons with the results of future studies and to facilitate their use as basic data in the standardization process. Therefore, the fit index results (showing that the four factors had a mediocre fit) were shown to be sufficient. Finally, appropriate and descriptive names for each factor were determined after consulting with a nursing professor. These factors were “Factor 1: nursing practice situations (self-efficacy associated with caring for the patient),” “Factor 2: nursing ethics situations (self-efficacy related to ethical situations in the nursing field),” “Factor 3: integrated nursing situations (self-efficacy associated with practicing integrated care),” and “Factor 4: nursing cooperation situations (self-efficacy associated with collaborating with colleagues and healthcare professionals).” Factor 1 mainly addresses self-efficacy related to the skill situation of nursing patients in clinical situations, whereas Factor 3 addresses self-efficacy

### Table 3

| Item: Considering a Typical Working Situation, I Can~ | Mean | SD  | Item–Total Correlation | Cronbach’s α/95% CI |
|-----------------------------------------------------|------|-----|------------------------|---------------------|
| **Factor 1: nursing practice situation (five items)** |      |     |                        |                     |
| 1 Respect patients and their autonomy (freedom of choice, right to self-determination). | 3.52 | 0.65 | .62                    | .79                 |
| 2 Ensure the health and safety of the society. | 3.32 | 0.71 | .65                    | .78                 |
| 3 Provide healthcare services based on professional standards, regardless of the situation. | 3.34 | 0.68 | .69                    | .77                 |
| 4 Provide healthcare services for individuals without discrimination and prejudice, based on the principle of equity. | 3.44 | 0.70 | .64                    | .78                 |
| 8 Review quality (accuracy/completion) of clinical records. | 3.47 | 0.68 | .51                    | .82                 |
| **Factor 2: nursing ethics situation (five items)** |      |     |                        |                     |
| 7 Ensure confidentiality of work-related information. | 3.81 | 0.72 | .71                    | .82                 |
| 9 Protect the legal and moral rights of patients. | 3.67 | 0.64 | .67                    | .83                 |
| 10 Protect privacy and confidentiality rights of patients when handling information. | 3.90 | 0.73 | .80                    | .79                 |
| 11 Fairly use professional data (resource/information) without breaking the rules. | 3.76 | 0.63 | .73                    | .82                 |
| 14 Ask for help from colleagues to evaluate certain situations and problems. | 3.75 | 0.67 | .49                    | .88                 |
| **Factor 3: integrated nursing situation (six items)** |      |     |                        |                     |
| 5 Handle flaws and inefficiencies that may occur at the working facility. | 2.90 | 0.77 | .64                    | .78                 |
| 6 Use ethical counseling to solve ethical dilemmas related to nursing (care). | 2.73 | 0.83 | .56                    | .80                 |
| 12 Recognize and solve ethical/moral dilemmas and problems at work. | 3.39 | 0.70 | .60                    | .79                 |
| 13 Ensure that nursing practice is based on the latest scientific knowledge. | 3.20 | 0.69 | .66                    | .78                 |
| 15 Apply various research outcomes to clinical practice. | 3.01 | 0.78 | .61                    | .79                 |
| 16 Refuse to take part in a treatment that goes against professional values. | 3.30 | 0.78 | .48                    | .82                 |
| **Factor 4: nursing cooperation situation (three items)** |      |     |                        |                     |
| 17 Participate in nursing research. | 3.37 | 0.75 | .52                    | .52                 |
| 18 Cooperate with nursing organizations to clarify nursing practice standards. | 3.56 | 0.67 | .56                    | .48                 |
| 19 Report any abusive or unethical behaviors of colleagues to respective regulation authority/agency. | 3.06 | 0.76 | .38                    | .71                 |
| Total (19 items) | 3.40 | 0.43 | .91                    | [90, 92]            |

*Note. CI = confidence interval.*
related to the nursing situation considering the integrated situation beyond one situation. Although the value of Item 19 in Factor 4 was low, this item was retained because of the importance of cooperation with colleagues in this factor (nursing cooperation situation). This study was affected by several limitations. Because data were collected in three regions of Korea, care must be taken when generalizing the results. Furthermore, the factor structure difference between the original NPSES and the K-NPSES highlights the importance of testing and using tools appropriate to the targeted cultural setting.

Conclusions

The results of this study confirm that the K-NPSES has acceptable validity and reliability with acceptable content, criterion, and construct validities; Cronbach’s alpha; and ICC. Moreover, the results support that the NPSES may have different factor structures in different cultures. Nevertheless, further studies should be conducted to establish the tool’s validity in different cultural settings.

Author Contributions

Study conception and design: SMK, JHK
Data collection: SMK, JMK
Data analysis and interpretation: SMK, JHK
Drafting of the article: All authors
Critical revision of the article: JHK

Table 4
Intraclass Correlation Coefficients of Four Factors K-NPSES

| Category | K-NPSES (M and SD) | Overall Tool |
|----------|-------------------|--------------|
|          | P                 | E  | I      | C      |               |
| Test     | 3.63              | 0.45 | 3.97 | 0.50 | 3.26 | 0.46 | 3.46 | 0.46 | 3.57 | 0.32 |
| Retest   | 3.35              | 0.43 | 3.69 | 0.54 | 3.42 | 0.32 | 3.44 | 0.39 | 3.45 | 0.31 |
| ICC      | .67               | .58  | .73  | .55  | .78  |

Note: K-NPSES = Korean version of the Nursing Profession Self-Efficacy Scale; P = nursing practice situation; E = nursing ethics situation; I = integrated nursing situation; C = nursing cooperation situation; ICC = interclass correlation coefficient.

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