Validity and Reliability of the Korean Version of the Stressors in Nursing Students Scale

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Purpose: This study sought to translate the Stressors in Nursing Students Scale (SINS) into Korean (SINS-K) and verify its validity and reliability for identifying stressors of Korean nursing students. **Methods:** A methodological design was used. The SINS scale was translated into Korean and administered to 428 nursing students. The results of 213 students were used for exploratory factor analysis, and 215 responses were used for confirmatory factor analysis. **Results:** The SINS-K showed good internal consistency. The measurement items were consistent, and the independence between factors was maintained. After confirming convergent validity and discriminant validity, the final scale was completed with 33 items. The four factors extracted from the SINS-K were named “clinical practice”, “finance”, “education”, and “conflict”. **Conclusion:** Despite differences in culture and language between countries, the results of this study are similar to those of the original tool. The findings provide information for developing strategies to reduce stressors among nursing students in a global context.

Key Words: Factor Analysis; Psychometrics; Students, Nursing; Translating

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INTRODUCTION

The stress experienced by students in a professional nursing program can cause emotional problems such as anxiety and depressive symptoms [1]. Moreover, it can reduce their interest in learning nursing science and has a negative effect on their perceptions of nursing as a professional occupation and on their future goals in nursing [1,2].

Higher levels of stress have been confirmed to have been present among nursing students than among non-nursing students, and their stresses include anxiety, sleep problems, and migraines [2]. According to previous studies investigating the stressors of nursing students, academic stressors such as the large burden of studying, numerous assignments and exams, and difficult subject material are the primary triggers of stress in this population [3]. Also, during clinical practice in hospitals, unfamiliar hospital environments, fear of making mistakes, being unprepared to observe patient suffering and death, and relationships with other medical staff members have been identified as stressors [4].

In addition, nursing students experience harm or disrespect from patients and caregivers in clinical practice and can experience stress stemming from conflicts with clinical instructors and fellow students [5]. Positive relationships between nursing students and clinical nurses are important for nursing students to feel accepted, valued, and like they belong [6]; notably, the reasons for attrition of nursing students area lack of emotional and practical support from colleagues and instructors, gaps in theory and clinical practice, and uncertainty in clinical practice [7]. In addition, nursing students experienced financial difficulties during clinical practice because they are unable to conduct paid work during clinical practice, resulting in a reduced income [8]. As such, nursing students suffered from a high level of stress because they had to perform a large amount of learning and experience early exposure to the working field through clinical practice compared to college students in other majors. In foreign studies, 1/3 of nursing students are under serious stress that causes mental health problems such as anxiety and depression [9], and in domestic studies, the level of stress was high in mental health problems [10]. However, previous studies focused on research regarding stressors related to the academic and clinical practice of nursing students, and studies on overall stressors, including the financial and interpersonal conflicts of nursing students have been insufficient.

Currently, the only tool created to measure the stressors

of nursing students in Korea was developed by Yoo [11]. Tools developed by Yoo [11] are divided into the clinical and university level. Clinical-level stress consists of 20 questions, consisting of factors related to the clinical environment of the trainee, practice instructors and medical staff, and trainees. University-level stress consists of 39 questions, consisting of intra-individual, inter-individual, environmental, and academic factors. However, the tool of Yoo [11] has a rather large number of items with a total of 59 items, and contains items that only female students can answer, such as 'Menstrual problem', which has limitations in its application to male students. Deary et al.[12] developed the Stressors in Nursing Students Scale (SINS) to measure the stressors of nursing students. SINS consists of the subscales of clinical practice, confidence, education, and finance. It was developed in English and has since been translated into various languages such as Chinese, Japanese, and Spanish [13-15], but it was not translated into Korean. Therefore, in this study, to measure the stress factors of domestic nursing students, the SINS was translated into Korean and the reliability and validity were verified.

METHODS

1. Study Design

This is a methodological study that translated the SINS into Korean and tested its validity and reliability.

2. Setting and Sample

Data was collected using an online questionnaire from a convenience sample of nursing students in Korea. Eligibility criteria for participating in this study were nursing students with clinical practice experience among Korean nursing students. Data collection was performed between October and November 2020 by posting recruitment notices with research purposes on online cafes (Ganjunmo) and bulletin boards (Nursestory, Nurscape) used by Korean nursing students. Exploratory factor analysis (EFA) needed 4 to 5 times the number of participants [2], and confirmatory factor analysis (CFA) needed 200 participants [16]. Therefore, the required number of participants in this study is at least 415, with a plan for a total of 462 participants with an expectation for a 10% dropout rate. 434 participants were collected in total and 428 were used for the final analysis, excluding 6 with missing values. Two hundred fifteen of 428 participants were extracted using the Statistical Package for the Social Sciences program (IBM

Corporation, Armonk, NY, USA) random sampling method and were used for EFA, while the remaining 213 were used for CFA.

3. Ethical Consideration

The present study was approved by the institutional review board of the author's university (ewha-202010-0009-02). We obtained the necessary informed consent from participants before distributing the online survey; each participant read the content of the study and voluntarily agreed to participate, with the option to withdraw available at any time.

4. Instrument

1) Stressors in Nursing Students Scale (SINS)

The SINS is a tool designed to measure the stressors of nursing students and consists of four factors: clinical, confidence, education, and finance. These factors consisted of clinical factors (related to clinical practice such as fear of mistakes, relations with clinical staff, coping with patient pain or death), 9 items; confidence factor (related to interpersonal problem such as obstruction of work, conflict between clinical managers, educational atmosphere, university response to needs), 10 items; education factor (related to academic difficulty such as heavy class materials, grades, excessive learning, uncertain subject goals), 9 items; finance factors (related to financial problem such as lack of leisure expenses, insufficient living expenses, and making less money than non-nurse friends), 5 items; unclassified 10 items (e.g. competition with fellow students, lack of manpower and equipment, fear of job prospects). It is a self-administered questionnaire with a total of 43 items answered using a five-point Likert scale (1="not at all stressful" to 5="extremely stressful"). The Cronbach's α coefficient of the original English version were clinical .82, confidence .82, education .82, finance .83.

2) Life stress scale of college students

In this study, the method for verifying the criterion validity was to compare the correlation between the total score with K-SINS using the college student life stress scale of Chon [17]. The life stress scale of college students is a total of 50 questions, consisting of a Likert 4-point scale, and 8 areas applied to life stress of college students. The eight domains are divided into four factors in the interpersonal level (same-sex friends, opposite-sex friends, family relationships, and teaching relationships) and four factors in the performance task dimension (academic is-

suess, economic issues, future issues, and values issues). The reliability of each sub-factor was found to be in the range of .75-.88.

5. Translation

In this study, after obtaining approval for the use of the tool from original author, it was translated based on the procedure suggested by the World Health Organization [18]. In the first step, the authors translated the original tool from English to Korean and, involving an English expert who could speak both Korean and English, confirmed that each item was translated faithfully according to the content of the original tool. Next, in the back-translation stage, a professional translator who was fluent in both English and Korean and did not have knowledge of the questionnaire conducted reverse translation without looking at the original English text. In the last step, six professors of nursing colleges and instructors with clinical practice experience evaluated the translation equivalence, which was also confirmed by the original tool developer. In this step, the meaning of each item in the original English and subsequent Korean translations was confirmed as consistent, and the relevance of the content of the item in the two cultures was verified.

6. Data Analysis

Data analysis was performed using the SPSS/WIN 25.0 program (IBM Corporation, Armonk, NY, USA) and M-plus 8.0 program (Muthén and Muthén, CA, USA). Descriptive statistics were used to analyze the general characteristics of the participants. Content validity was verified by six professors of nursing colleges and instructors with clinical practice experience. The six experts was asked to rate each item using a four-point Likert scale: 1 (Not relevant), 2 (Needs modification), 3 (Some modification required), and 4 (Relevant and concise). The Item Content Validity Index (I-CVI) and Scale Content Validity Index using the Averaging methods (S-CVI/Ave) were calculated to confirm content validity. I-CVI was measured using a four-point Likert scale and calculated by awarding one point for questions answered using three to four points and zero points for questions answered using one or two points. It was considered adequate when the I-CVI value was .80 or more and the S-CVI/Ave value was .90 or more [19].

Item analysis was conducted to consider the homogeneity of the items constituting the tool, and the correlation between the items and the total score (corrected item total

correlation; ITC) was confirmed using the criterion that items with an ITC of .30 or less with a low contribution to the tool should comprise less than half of the total items [19]. EFA and CFA were performed to verify construct validity. Prior to conducting EFA, Kaiser-Meyer-Olkin (KMO) values and Bartlett's sphericity test were calculated to consider the suitability of factor analysis. The closer was the KMO value was to 1, the better the model converged; however, if the value was .50 or more, factor analysis is possible, and Bartlett's sphericity test value was judged according to the criteria deemed suitable for factor analysis when $p < .05$ [20]. EFA was performed using the principal component analysis and varimax rotations, with the number of factors fixed to four and extracted by referring to the number of factors of the original tool. The communality between items was based on more than .40 points [20]. To confirm the goodness of fit of the model, CFA was conducted to determine the χ^2 , ratio of χ^2 by degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). The fit of the model was considered adequate when χ^2/df of less than 3.0, CFI of more than .80, SRMR of less than .08, and RMSEA of less than .08 [21].

To analyze the internal consistency of the tool, the reliability was calculated as Cronbach's α coefficients. In addition, to verify the criterion related validity of the SINS-K, the College Student Life Stress Scale [17] was used as criteria and the correlation was analyzed through Pearson's correlation coefficient.

RESULTS

1. Demographic Characteristics

A total of 428 participants was selected. Almost all were women (90.9%), and the mean age was 23.39 ± 2.57 years. There were 270 (63.1%) students in the fourth year, 125 (29.2%) in the third year, and 33 (7.7%) in the second year (Table 1).

2. Validity

1) Content Validity

Content validity was verified using I-CVI and S-CVI/Ave. The 43-item SINS-K was given I-CVI values of .83 or above and S-CVI/Ave value was .98. Therefore, none of the items were deleted through content validity verification.

Table 1. Demographic Characteristics of Participants ($N=428$)

Variables	Categories	n (%) or M $\pm$ SD
Gender	Women	389 (90.9)
	Men	39 (9.1)
Age (year)		23.39 $\pm$ 2.57
Academic year	2nd year	33 (7.7)
	3rd year	125 (29.2)
	4th year	270 (63.1)
Subjective health status	Very healthy	123 (7.2)
	Healthy	83 (44.9)
	Ordinary	109 (34.1)
	Unhealthy	93 (12.9)
	Very unhealthy	4 (0.9)
Main reason for major selection	Personal aptitude	73 (17.1)
	Recommendations from family or acquaintances	71 (16.6)
	High employment rate	165 (38.5)
	Professional occupation	97 (22.7)
	Grades	18 (4.2)
	Others	4 (0.9)
Major satisfaction	Very satisfied	46 (10.7)
	Satisfaction	208 (48.6)
	Ordinary	131 (30.6)
	Unsatisfactory	41 (9.6)
	Very dissatisfied	2 (0.5)
Clinical practice satisfaction	Very satisfied	33 (7.7)
	Satisfaction	141 (32.9)
	Ordinary	148 (34.6)
	Unsatisfactory	91 (21.3)
	Very dissatisfied	15 (3.5)

2) Construct validity

As a result of confirming homogeneity between individual items and the total score through analysis of 43 items. Prior to performing EFA, the stability of data for factor analysis was assessed. The KMO value was .92, and Bartlett's sphericity test was $\chi^2=4,434.80$ ($p < .001$), suggesting statistical significance. EFA was analyzed using principal component analysis and varimax rotation. Four items ("Fear of poor job prospects", "The atmosphere created by teaching staff", "The college response to students needs", and "Making less money than friends who are not nurse".) were removed because they had low communality ($< .40$). The communality between 39 items was .41 - .65 and the extracted four factors explained for 51.8% of the total variance. "Not being sure what is expected on placement" was not classified in SINS but was classified as a clinical practice factor in the Japanese, and Spanish translation tools. Therefore, although this study showed a

high factor loading on educational factor, it was also included in clinical practice factor based on the contents of the items and previous studies. “Fear of making a mistake in clinical placements” was classified as a clinical practice factor in the SINS, Chinese, Japanese, and Spanish translation tools. Therefore, In this study showed that the same factor loading on educational and clinical practice factor, it was also included in clinical practice factor based on the contents of the items and previous studies.

As a result, “factor 1 (clinical practice)” consisted of 18 items with the eigen value of 13.75 and explained for 18.7%, “factor 2 (finance)” consisted of 8 items with the eigen value of 2.70 and explained for 12.3%, “factor 3 (education)” consisted of 8 items with the eigen value of 2.27 and explained for 12.1% and “factor 4 (conflict)” consisted of 5 items with the eigen value of 1.48 and explained for 8.7% (Table 2).

After the EFA analysis, a CFA was performed to evaluate the suitability of four factor structure’s model fit. The results revealed the following goodness-of-fit values: $\chi^2=1403.43$ ($p<.001$), $\chi^2/\text{dF}=2.01$, SRMR=.08, CFI=.78, and RMSEA=.07 (90% confidence interval: .056~.071). We removed six items (“Not getting enough feedback about performance”, “Competition from fellow students”, “The lack of free time”, “Not having enough time for friends and family”, “Fear of failing in the course”, and “Having no time for entertainment”). whose standardized regression coefficients is less than .50 [20] and standardized regression coefficients of remained 33 items were statistically significant ($p<.05$) and between .51 and .77; the resulting revised four-factor model had the following goodness-of-fit values: $\chi^2=931.46$ ($p<.001$), $\chi^2/\text{dF}=1.90$, SRMR=.07, CFI=.84, and RMSEA=.07 (90% confidence interval .06~.07) (Table 3). The item convergent and discriminant validity was confirmed using average variance extracted (AVE) and composite reliability (CR) in the final model. The AVE values for Factor 1, Factor 2, Factor 3 and Factor 4 were .37, .39, .46, and .33, respectively. It was confirmed that the AVE was greater than the square of correlation coefficient between the factors. The CR values for each factors were .90, .80, .81, and .90, respectively (Table 4). A total of 33 items, the goodness of fit for four factor structure’s model, were found that all goodness-of-fit values reached the criteria. The final version is Appendix 1 and is named SINS-K.

3. Reliability

Cronbach’s α coefficient was analyzed. To investigate internal consistency, the reliability of the tool for a total of

33 items of the final SINS-K was evaluated as a result of each factor. Cronbach’s α coefficients of the tool were .91 for factor 1, .79 for factor 2, .81 for factor 3, and .73 for factor 4. The item-total scale correlation range of this research tool was .36 to .64 (Table 2). In addition, the coefficients of the item-total subscale correlation ranged from .41 to .53 for the Clinical practice subscale, from .49 to .65 for the Finance subscale, from .47 to .57 for the Education subscale and from .44 to .51 for the Conflict subscale.

4. Criterion-related Validity

The criterion-related validity of the SINS-K was confirmed by how well it correlated with “The College Student Life Stress Scale”. The results of the Pearson correlation coefficient of SINS-K and “The College Student Life Stress Scale” showed a significant positive correlation ($r=.62$, $p<.001$).

DISCUSSION

This study translated SINS into Korean and confirmed its reliability and validity to measure the stressors of Korean nursing students who experience high stress due to demands of academics and clinical practice. The content validity of SINS-K was S-CVI/Ave=.98, which was confirmed to be valid for measuring the stressors of Korean nursing students.

The four factors extracted from this study were clinical practice; finance; education and conflict. Looking at the factors classified in the original tool and the translated version, the original tool was classified into clinical practice; finance; education and confidence. In the Chinese version, it was classified into clinical practice; finance; education and confidence, and in the Japanese version, clinical; conflict and confidence; education and Free time. It can be confirmed that the conflict factor was only observed in this study and the Japanese study.

To discuss by factors classified in this study, first, Clinical practice factors included the largest number of items. Among the translated versions, it was most similar to the Japanese version, with the difference being that question “Criticism from fellow students or seniors”, was unclassified in the original tool. This question was classified as a ‘clinical practice’ factor in the Japanese version, but it is thought that it was classified as a ‘conflict’ factor in this study because there was no clear distinction between clinical practice or education that caused the stress. This was consistent with the results of a Park’s study [22] that identified unclear practice objectives as factors related to prac-

Table 2. Results of the Exploratory Factor Analysis and Factorial Saturation of Items after Varimax Rotation (N=215)

Factor	No.	Items	M±SD	Comm.	CITC	Factor loading			
						F1	F2	F3	F4
F1. Clinical practice	13	The attitudes and expectations of other professionals (doctors, administrators, social workers, etc.) towards nursing	3.10±1.09	.59	.63	.72	.03	.12	.24
	20	Dealing with uncooperative, anxious, abusive or otherwise difficult patients or relatives	3.41±1.16	.59	.51	.71	.09	.25	.11
	8	Patients' attitudes towards me	2.98±1.05	.57	.59	.68	.34	.02	.01
	12	Caring for the emotional needs of patients	3.09±1.02	.51	.51	.64	.24	.15	.11
	40	Speaking to patients' relatives	3.05±1.18	.57	.64	.64	.20	.01	.36
	32	Patients attitudes towards nursing	3.30±1.10	.54	.62	.63	.33	.14	.12
	15	Not having enough staff or equipment to meet patients' needs	3.15±1.09	.52	.59	.63	.27	.16	.18
	30	Relations with other professionals	2.82±1.15	.55	.63	.62	.26	-.09	.31
	21	Conflicts with staff in placements	3.09±1.17	.55	.64	.62	.24	.20	.28
	39	Feeling responsible for what happens to patients	3.38±1.05	.46	.64	.58	.06	.29	.18
	43	Coping with suffering or death of patients	3.27±1.18	.43	.55	.58	.07	.22	.21
	11	Relations with staff in the clinical area	3.38±1.09	.52	.56	.54	.23	.41	.11
	9	Fear of making a mistake in clinical placements	3.53±1.11	.56	.53	.53	-.01	.53	-.03
	3	Having too much clinical responsibility	3.49±0.99	.42	.52	.52	.15	.33	.10
	14	Being interrupted on clinical duties	3.33±1.14	.46	.58	.52	.20	.28	.27
	27	Conflicts with administrators or managers	2.81±1.20	.54	.63	.49	.35	.07	.41
	23	Not being sure what is expected in the course	3.08±1.10	.45	.56	.45	.19	.25	.38
	34	Not being sure what is expected on placements	3.57±1.14	.46	.61	.33	.10	.55	.20
F2. Finance	28	Not having enough money for entertainments	3.37±1.12	.64	.42	.11	.75	.23	.11
	37	Surviving on a low income	3.22±1.23	.58	.49	.13	.73	.02	.19
	35	No time for leisure or hobby	3.48±1.05	.50	.57	.19	.64	.23	.07
	5	Personal problems other than health	2.97±1.07	.57	.54	.21	.63	.21	.30
	38	Personal health problems	2.84±1.16	.45	.58	.20	.61	.12	.17
	42	Physical health of family members	3.05±1.06	.44	.52	.20	.59	.17	.16
	25	Insufficient time with friends and families	3.18±1.11	.41	.55	.26	.51	.28	.00
	2	Relationships with family members	2.65±1.09	.43	.45	.15	.47	-.01	.43

CITC=corrected item-total correlations; Comm.=communality; F=factor.

Table 2. Results of the Exploratory Factor Analysis and Factorial Saturation of Items after Varimax Rotation (Continued) (N=215)

Factor	No.	Items	M±SD	Comm.	CITC	Factor loading			
						F1	F2	F3	F4
F3. Education	1	The amount of classwork material to be learned	3.84±0.93	.65	.36	.08	.21	.77	.04
	18	Having too much to learn	3.89±0.97	.64	.41	.13	.21	.75	.08
	7	Examinations and placement gradings	3.77±1.03	.60	.55	.16	.16	.74	.04
	4	The difficulty of the classwork material to be learned	3.56±0.99	.46	.45	.04	.03	.63	.24
	29	Meeting deadlines for coursework	3.47±1.18	.50	.45	.14	.40	.56	.06
	22	Insufficient rest time	3.73±1.04	.57	.60	.36	.45	.47	-.14
	10	Competition with co-worker (peer)	3.31±1.16	.42	.50	.19	.03	.44	.44
	6	Insufficient feedback about the academic and clinical practice	3.32±1.03	.43	.63	.36	.23	.44	.24
F4. Conflict	33	Fear of failing in courses	3.31±1.24	.45	.51	.24	.08	.22	.58
	24	Criticism from peers or senior staff	2.86±1.28	.62	.55	.28	.14	.11	.72
	17	Conflicts with peers	2.89±1.22	.60	.58	.17	.31	.16	.68
	31	Not having anyone to talk to about the course	3.02±1.16	.49	.54	.41	.34	.09	.46
	36	Conflicts with college staff	2.69±1.22	.47	.56	.34	.38	-.04	.45
	Factors' descriptive statistics (M±SD)					3.17±0.78	2.96±0.87	3.71±0.81	2.78±0.91
	Eigen value					7.30	4.84	4.72	3.41
	Explained variance (%)					18.69	12.31	12.14	8.67
	Cumulative variance (%)					18.69	31.00	43.14	51.81

CITC=corrected item-total correlations; Comm.=communality; F=factor.

Table 3. Model Fit Index of Confirmatory Factor Analysis

(N=213)

χ^2	χ^2/df	SRMR	CFI	RMSEA
931.46	1.90	.07	.84	.07

CFI=comparative fit index; RMSEA=root mean square error of approximation; SRMR=standardized root mean squared residual.

Table 4. Correlations, Discriminant and Convergent Validity of the K-SINS

(N=213)

Variables	Correlation matrix			r^2						Convergent validity	
	F1	F2	F3	r 12 ²	r 13 ²	r 14 ²	r 23 ²	r 24 ²	r 34 ²	AVE	CR
F1	-									0.37	.90
F2	.53*	-		.28	.19	.40	.07	.29	.09	0.39	.80
F3	.44*	.27*	-							0.46	.81
F4	.63*	.54*	.30*							0.33	.74

AVE=average variance extracted; CR=composite reliability; F1=Clinical practice related stressor; F2=Finance related stressor; F3=Academic related stressor; F4=Conflict related stressor; r 12²=square of the correlation between factors 1 and 2; r 13²=square of the correlation between factors 1 and 3; r 23²=square of the correlation between factors 2 and 3; r 24²=square of the correlation between factors 2 and 4; r 34²=square of the correlation between factors 3 and 4; *p < .001.

tical stress. It is believed to be related to the clinical practice situation of nursing students where only repeated and simple performances such as observation and vital signs measurements are allowed [23]. In addition, the faculty of nursing colleges set the goal of providing a holistic assessment through the nursing process to the care students learned in school, whereas nurses in clinical settings tend to pay attention to disease and its treatment rather than the holistic point of view. It is also thought to be related to the inconsistency between the educational content required by the hospital and the clinical education content.

Educational factors were consistent with those of the SINS and comprised reports of large assignments, complex examinations, high difficulty of classwork, and a large workload. However, the number of items for the education factor was 9 in the original tool, but was reduced to 5 in this study. In particular, the item “Not being sure what is expected in the course”, was deleted from the Korean, Japanese, and Chinese versions. This means that the time between the year the original tool was developed and the study period of the translated version was 15 years, suggesting that there was a positive change in the delivery of educational goals compared to the time when the tool was first developed.

In finance factors, SINS-K excluded item “making less money than friends who are not nurses”. Item “Fear of poor job prospects”, which was an unclassified item in the SINS, was deleted as well. This change was made to reflect Korea's unique characteristics. As a result of analyzing the general characteristics of this study, the response rate of choosing a nursing major “because of a good employment rate” was highest at 38.6%. Currently, the youth unemployment rate in Korea is significant. On the other hand, the employment rate of nurses was 86.4% [24], which was much higher than the national average employment rate of 67.7% among college graduates as of 2018. In addition, the starting salary of nurses is USD 29,301.96 [25], which was higher than the expected average annual salary of USD 25,928.50 for all jobs [26]. Based on this situation in Korea, two items such as “Fear of poor job prospects”, “Making less money than friends who are not nurse,” were considered inappropriate. However, in the study of Feeg and Mancino [8], more than one-third of nursing students received loans to cover tuition, and more than one-quarter worked full-time. In Korea, there was no research on how to cover tuition for nursing college students. However, a survey on tuition for general college students revealed that 62.2% receive help from their parents (family) and 7.3% receive loans [27]. As the difference in tuition between general college students and nursing students is not

significant [27], it was thought that the situation among nursing students would be similar. Such financial problems are thought to be one of the common stressors of nursing students.

The conflict factor was named confidence in SINS, but conflict herein because it consisted of items representing conflict with others such as classmates, seniors, and university faculty members. It was also named conflict in the Japanese-language version. Nursing students experience stress in their relationships with professors, patients, families, and other medical staff during clinical practice [6]. In particular, they experience fear of criticism and insults in their relationships with clinical nurses, and a positive relationship with clinical nurses can influence nursing student confidence in clinical practice [28]. Student confidence increases when interpersonal relationships are positive. During clinical practice, students with strong vertical collectivist cultures such as those in Korea and Japan [29] tend to experience a negative aspect of conflict, which acts as a stressor.

In this study, the fit of the model through CFA met the criteria as $\chi^2=931.46$ ($p < .001$), $\chi^2/\text{dF}=1.90$, SRMR=.07, CFI=.84, and RMSEA=.07. For the criterion validity test, the college student life stress scale, whose validity and reliability were verified, was used, and as a result of analyzing the correlation, it was statistically significant ($r=.62$). SINS-K can be used by all nursing students regardless of gender when compared with existing tools such as Yoo [11], which consists of 59 items. In addition, it is thought that it will be convenient to use the appropriate number of items with a total of 33 items.

Through this study, the validity and reliability of SINS-K, which can measure stress factors in various fields such as clinical practice, education, finance, and conflict of nursing students was confirmed. Therefore, this tool is meaningful in nursing education in that it can help identify overall stress factors of nursing students and contribute to developing an intervention program for stress reduction. In addition, it is thought that it will help to improve the clinical practice environment by identifying the causes of stress experienced by students in clinical practice starting from the highest value stressors of nursing students.

However, this study has the following limitations. First, In evaluating the goodness model fit, the CFI value did not reach the appropriate standard of .90. When developing SINS, a sample size of at least 300 to 400 participants was proposed, but this study was conducted based on a previous idea that an ideal sample size for factor analysis was 200 participants or more [30]. Therefore, to confirm the reliability and validity of this tool, additional research is nec-

essary with a greater number of samples. Second, As a result of EFA, the cross loading was showed in 5 items. In the convergence validity, the AVE value was less than .50 and did not meet the criteria. Therefore, it is necessary to re-verification. Third, since this study used an online questionnaire for convenience sampling, there are limitations in generalizing the research results.

CONCLUSION

Through this study, the reliability and validity of a tool that can measure the stressors of Korean nursing students in various areas were confirmed. The use of SINS-K, whose validity was confirmed through the results of this study, will help to compare the stressors of nursing students between countries and cultures. SINS-K will be useful in identifying stressors in the areas of finance and conflict as well as with respect to previously known educational and clinical practice stressors.

In addition, SINS-K will be useful in identifying the stressors of Korean nursing students and developing a stress-intervention program to effectively improve them.

CONFLICTS OF INTEREST

The authors declared no conflict of interest.

AUTHORSHIP

Study conception and design acquisition - CM; Data collection - CM, LJ, KH and KB; Data analysis & Interpretation - LJ and KB; Drafting & Revision of the manuscript - CM and KB.

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Appendix 1. 한국어판 간호대학생 스트레스 요인 척도 (SINS-K)

다음은 귀하의 스트레스 요인을 파악하기 위한 질문입니다. 각 문항을 읽고 귀하에 해당되는 스트레스 정도에 따라 해당되는 칸에 "✓" 표시를 해주십시오.

문항	내용	스트레스가 전혀 없다 (1)	스트레스가 없는 편이다 (2)	보통이다 (3)	스트레스가 있는 편이다 (4)	스트레스가 매우 높다 (5)
1	학습해야 할 수업 자료의 양					
2	가족구성원과의 관계					
3	임상실습에서의 과중한 책임감					
4	학습할 수업 자료의 어려움					
5	건강 이외의 개인적인 문제					
6	시험과 임상실습 점수					
7	나를 대하는 환자의 태도					
8	임상실습에서 실수하는 것에 대한 두려움					
9	임상실습에서 간호사와의 관계					
10	임상실습에서 환자의 정서적 요구를 케어하는 것					
11	간호에 대한 다른 전문가 (의사, 행정관리자, 사회복지사 등)의 태도와 기대					
12	다른 우선순위에 의해 하고 있던 실습업무 중단 또는 방해					
13	임상실습시 환자의 요구를 해결하기 위한 인력과 장비가 불충분함					
14	동료 학생들과의 갈등					
15	과다한 학습량					
16	임상실습에서 환자나 보호자들의 불안, 비협조적인 태도, 모욕적 언행에 대처하는 것					
17	임상실습에서 간호사와 갈등					
18	불확실한 교과목 학습목표					
19	동료학생 혹은 선배로부터 비판					
20	임상실습에서 관리자 (수간호사 등)와의 갈등					
21	여가활동에 사용할 경비 부족					
22	과제 마감일을 준수하는 것					
23	다른 분야 전문가 (의사, 행정관리자, 사회복지사 등)와의 관계					
24	학업과정에 대해 의논할 대상 부재					
25	간호를 대하는 환자의 태도					
26	임상실습지에서 무엇을 해야 하는지 불확실함					
27	대학 교직원과의 갈등					
28	부족한 생활비					
29	개인의 건강문제					
30	임상실습에서 환자에게 발생한 일에 대한 책임감					
31	임상실습에서 환자의 보호자와 대화					
32	가족구성원의 건강					
33	임상실습에서 환자의 고통이나 죽음에 대한 대처하는 것					

임상실습 관련 스트레스 문항: 3,7,8,9,10,11,12,13,16,17,18,20,23,25,26,30,31,33; 경제문제 관련 스트레스 문항: 2,5,21,28,29,32; 학업 관련 스트레스 문항: 1,4,6,15,22; 대인갈등 관련 스트레스 문항: 14,19,24,27.