Campus Life Adaptation Scale for nursing undergraduates: Development and psychometric evaluation

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ABSTRACT

Background: As the number of studies about nursing students' adaptation to college life has increased, issues have surfaced regarding the validity of study results and the lack of valid and reliable instruments to measure nursing students' adaptation to college life.
Study objective: To develop a valid and reliable instrument to measure nursing students' adaptation to college life in view of the educational demands.
Study design: A methodological study design was employed to develop and test the measurement.
Setting: Participants were distributed over a range of grades, from freshmen to seniors in six universities in Korea.
Participants: Convenience sampling was performed with 813 students from six nursing schools in Korea. The mean age of the nursing students was 21.7 (± 4.70), and females were in the majority at 89.2%.
Methods: Factors affecting campus life adaptation of nursing undergraduates were extracted by conducting a literature review and analyzing the interviews performed. Reliability and content validity were studied. The authors utilized a cross-validation measurement model using EFA with the first half of the dataset and CFA on the second half of the dataset to show the fit statistics of the factors identified via EFA verification.
Results: Analysis of 34 items revealed six factors accounting for 55.1% of the total variance. The factors identified included interpersonal relationships, satisfaction with one's major, ease of studying one's major, stress management, preparation for employment, and academic commitment. The six-factor measurement models exhibited good fit indices. The concurrent validity, known group comparison, and reliability were satisfactory.
Conclusion: This Campus Life Adaptation Scale will offer a framework upon which counseling and management strategies can be developed to help nursing students successfully adapt to campus life.

1. Introduction

For the past seven years, there has been a quantitative increase in the number of college nursing departments in Korea, from 52 in 1990 to 203 in 2016 according to a government report, due to a nursing shortage and increasing demands placed upon nurses within the aging Korean society (KNA, 2016). In addition, there has been a drastic increase in the number of students who have chosen a nursing major, as it can offer more job security and employment opportunities when compared to other majors (Wilkes et al., 2015; M.H. Choi et al., 2015; S.O. Choi et al., 2015). There has also been an increase in the number of nursing students who experienced anxiety or stress related to failing or dropping out of school (Pulido-Martos et al., 2012: Kim, 2012), and an increase in those who actually consider taking a year off from their studies, transferring to another major, or dropping out of school, as they are unable to succeed academically or adapt to the nursing major (Park, 2014).

Most of the existing studies about the college life of nursing students have been conducted on the stress experienced due to clinical training (Admi et al., 2018; Rankin, 2012). Moreover, as the number of studies on nursing students' adaptation to college life has increased, issues have emerged regarding the validity of study results and the lack of valid and reliable instruments to measure nursing students' adaptation to college life. Baker and Siryk's (1984) Student Adaptation to College Questionnaire was developed to measure freshmen students' adjustment to college life. It has limitations in that it does not reflect the characteristics of nursing students who are training to be nursing experts and students beyond the freshman year.

The current study develops a valid and reliable instrument for measuring nursing students' adaptation to college life, considering the educational demands related to socializing, culture, and career paths. The goals of the study were to improve the existing curriculum and establish an efficient intervention for adapting to college life.

2. Background

Adaptation to campus life refers to a series of reactions to, and the process of coping with, changes and challenges experienced by college students in campus living (Yun and Min, 2014; Cousins et al., 2017; Lee and Park, 2018). College students are in the stage of young adulthood, and must develop emotional independence and prepare to enter society after graduation.

Most college students are likely to experience difficulties adjusting to the varied demands of a college environment (M.H. Choi et al., 2015; S.O. Choi et al., 2015). A commonly used framework, outlined by Lazarus and Folkman (1984), is the cognitive appraisal coping model. In this model, coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus and Folkman, 1984, p. 141). The problem-focused coping that attempts to reduce the stressfulness of the situation and emotional coping negatively associated with negative mood and academic stress (Cousins et al., 2017). The adjustment of college students who cope with would categorized in terms of academic adjustment, social adjustment, personal–emotional adjustment, and institutional attachment (Cousins et al., 2017).

Twenty percent of nursing students reported they had poor adjustment in both individual and social aspects (Horgan et al., 2016). In terms of academic characteristics, most nursing programs have curricula that encompass overall health concepts from basic to complicated issues, and nursing students can be overwhelmed as they explore their major. Nursing students experience academic stress about testing and evaluations, fear of failure in training, and workload concerns (Pulido-Martos et al., 2012; Labrague et al., 2017). The academic burden may lead to difficulties adjusting to college (Labrague et al., 2017; Pryjmachuk and Richards, 2007).

Considering that nursing students with limited peer support felt more depression (Horgan et al., 2016), the maintenance of good relationships with peers and instructors also should be prioritized to maximize academic outcomes and satisfaction with student life (Horgan et al., 2016; Iwata et al., 2014). Difficulties in discussing and communicating with staff can occur in the clinical practice setting during clinical rotations (Gibbons et al., 2011; Pulido-Martos et al., 2012). Thus, social aspects must be emphasized for campus life adaption in the university environment.

In terms of personal and emotional factors, studies have reported that nursing students experience a higher level of stress pursuing their major when compared to students in other majors (Barbosa et al., 2013; Labrague et al., 2017). Identified reasons for this include psychological pressure and emotional burden due to excessive workloads, reduced motivation, and fierce competition with peers (Lee and Park, 2012).

Such unresolved difficulties and maladaptation could lead to experiencing problems such as deteriorating academic performance or lack of enthusiasm, which can have an influence later when students considering a nursing position (M.H. Choi et al., 2015; S.O. Choi et al., 2015). Some nursing students entered the nursing program based on the suggestions of their families or relatives (M.H. Choi et al., 2015; S.O. Choi et al., 2015; Wilkes et al., 2015). This external motivation to enter the nursing program might contribute to various challenges with following the nursing curriculum.

Additionally, most of the existing studies focused primarily on the students' first year (Kalsner and Pistole, 2003; Friedlander et al., 2007). Horgan et al. (2016) reported that students in their second year of study had significantly more depressive symptoms, which led to maladaptation to school life and academic interests. With the transition into higher education, especially for the nursing major, in which students transition from learning basic to more complicated subjects (McComb and Kirkpatrick, 2016), assessing adaption to campus life should be essential from the beginning of nursing school.

3. Methods

3.1. Study design

This study used a methodological study design to develop and verify the validity and reliability of an instrument to measure the campus life adaptation of nursing undergraduates.

3.2. Instrument development

3.2.1. Generation of dimensions and items

This study identified the properties of campus life adaptation of nursing undergraduates and extracted components by conducting a literature review and analyzing focus group and individual interviews performed. After obtaining the approval of the Institutional Review Board of D University (NO 2016-03-003), the researchers conducted focus groups and individual interviews. They assured participants of both anonymity and confidentiality, and informed consent was obtained from participants before the interviews. Seventeen nursing students (five students from each grade, freshmen to seniors) from one nursing department participated in the interviews. It has been noted that the proportion of male nursing students in Korea has exceeded 10% recently (Chung, 2018); 30% of participants in the current study were male. During recruitment from the nursing department, difficulties in adaptation experienced by male nursing students were reported more often than those among female nursing students. The average age of male students was 21.95, five had previously taken years off from school, and three were considering taking years off from school as they had difficulties adjusting to the nursing major. For each grade, such questions as "How was it for you to adapt to life in nursing school?" and "What do you think it means to adapt to nursing school?" were asked during the interview. From the focus group interview, personal interviews were conducted with four students for whom it was regarded necessary to have an individual interview. Focus group interviews lasted 60–100 min, while individual interviews lasted 30–60 min. The interviews were audio recorded and transcribed verbatim with permission. Qualitative data from the focus group interviews were analyzed thematically. The contents of the interviews were then classified into semantic units, implied semantic units, topics, and subtopics through content analysis. Also, by analyzing the literature review and interview contents, the researchers confirmed the components of nursing students' adaptation to college life. The following properties of the nursing students' adaptation to campus life were conceptualized: "harmony in the curriculum" (satisfaction with major, academic achievement, harmony with clinical training); and "harmony in activities" (interpersonal relationships, personal emotions, campus, and extracurricular activities). Based on these properties, 128 preliminary questions scored on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) were extracted (Fig. 1).

3.3. Content validation of the scales

According to Lynn's (1986) ratio of content validity criteria, questions for which the content validity index (CVI) was.83 or higher were selected and the second validity test was conducted by revising the questions, if necessary. Finally, a total of 60 questions were selected.

3.4. Pilot test

In the preliminary survey of 60 students at a nursing college, the level of understanding for each question in the preliminary instrument was measured on a five-point Likert scale, from "very difficult" to "very
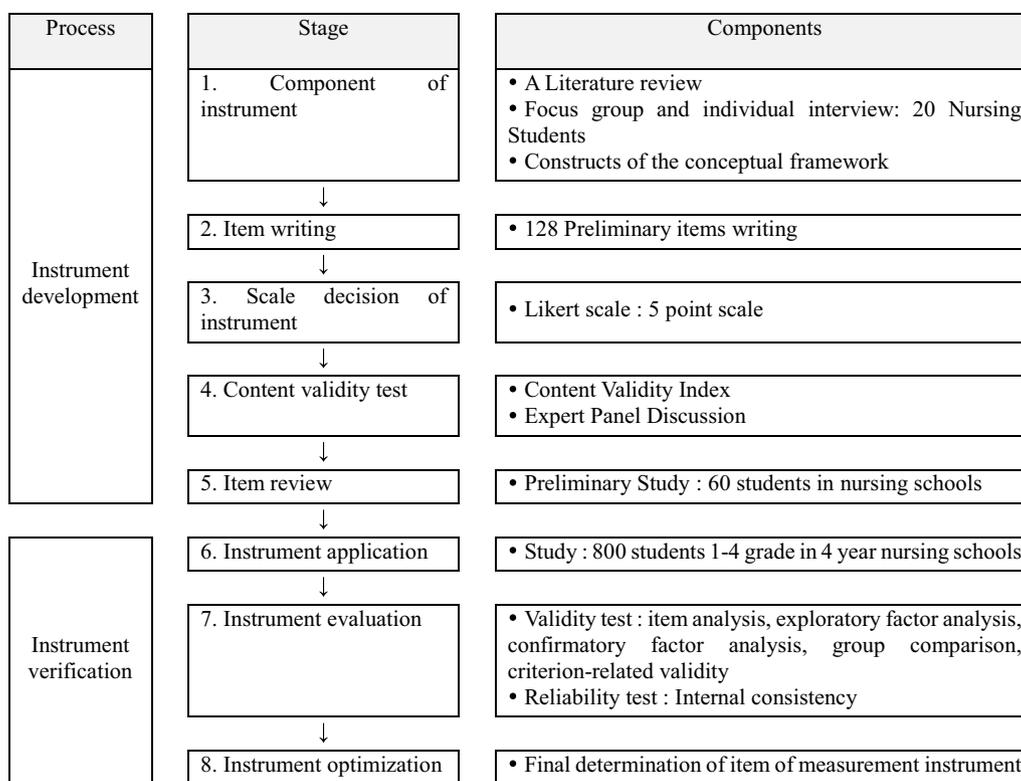
Process	Stage	Components
Instrument development	1. Component of instrument	• A Literature review • Focus group and individual interview: 20 Nursing Students • Constructs of the conceptual framework
	↓	
	2. Item writing	• 128 Preliminary items writing
	↓	
	3. Scale decision of instrument	• Likert scale : 5 point scale
	↓	
	4. Content validity test	• Content Validity Index • Expert Panel Discussion
	↓	
	5. Item review	• Preliminary Study : 60 students in nursing schools
	↓	
Instrument verification	6. Instrument application	• Study : 800 students 1-4 grade in 4 year nursing schools
	↓	
	7. Instrument evaluation	• Validity test : item analysis, exploratory factor analysis, confirmatory factor analysis, group comparison, criterion-related validity • Reliability test : Internal consistency
	↓	
	8. Instrument optimization	• Final determination of item of measurement instrument

Fig. 1. Flow chart the scale development.

easy." The level of understanding for the questions was rated at 4.69 ± 0.50, and the appropriateness of the length of the question was 4.17 ± 0.62. All respondents reported that the questions were generally easy or very easy to understand. No questions were revised after the pilot test.

3.5. Participants

The mean age of the nursing students was 21.7 (± 4.70), and females made up the majority at 89.2%. About 65% were living with their parents, and 85.0% reported their families were in the middle class economically. About 59% responded that they occasionally had problems with interpersonal relationships. The average satisfaction score for the nursing major was 6.5 (± 1.82) points out of 10.

3.6. Data collection

Data were collected from six universities located in four cities under same the approval of the Institutional Review Board of D University (NO 2016-03-003). Convenience sampling was performed with 813 students from six nursing schools. Data collection using questionnaires was conducted with convenience sampling, and the proportion of male students was 10.8%, which is similar to the sex ratio of all nursing students in Korea. Participants were evenly distributed throughout the grades, from freshmen to seniors, and were assured of anonymity and confidentiality. Informed consent was obtained from all participants. Nunnally and Bernstein (1994) reported that a sample of 10 persons is required for each final question item to reduce sampling error; therefore, a sample of 400 persons was required to verify the instrument's ability to measure the campus life adaptation of nursing undergraduates. The cross validation measurement model using EFA was utilized with the first half of the dataset and CFA on the second half of the dataset to show the fit statistics of the factors identified from EFA verification.

3.7. Instrument for concurrent validity

For purposes of the current study, the college life adjustment scale developed by Jung and Park (2009) was used to measure adaptation to college life. The scale consists of 29 questions. Higher scores indicate better adaptation to college life.

3.8. Data analysis

To confirm the factor structure of the campus life adaptation of nursing undergraduate scales, the participants were divided into two groups using random code and exploratory factor analysis; confirmatory factor analysis was then conducted for each group. EFA was conducted using principal component analysis with Varimax rotation. For the best model, analyses were based on the criteria of an eigenvalue greater than one.

The fitness of the model was verified by the Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Normed Fit Index (NFI), and the Root Mean Square Error of Approximation (RMSEA). The fit of the model was determined by having an RMSEA index of < 0.08, if it was appropriate, and TLI and CFI indices > 0.90 (Finch and West, 1997). For the known group comparison, a t-test and ANOVA were used. The correlation between the total score-factor and the criterion-related validity test were analyzed using the Pearson coefficient, while the reliability test was analyzed using Cronbach's α coefficient. The data were analyzed using the IBM SPSS Statistics software 23.0 and AMOS 23.0 (IBM, Armonk, New York, USA).

4. Results

4.1. Construct validity

EFA results revealed that KMO was .89, and Bartlett's sphericity test results showed that the χ^2 statistic was 5355.56 ($p < .001$). Analysis of 34 items revealed six factors for which the eigenvalue was 1.0 or

higher, accounting for 55.1% of the total variance. A scree plot also confirmed that six was an appropriate number of factors.

Items were retained in each factor based on the factor loading value equal to or > 0.4. It was concluded that item 57, "I actively participate in the events of the department," covered the interpersonal relationships nursing students need to adapt to campus life. As a result of reviewing the factor loading that the item has in Factor 1, it was observed to have commonness for the factor at 0.41. Therefore, it was reconstructed as Factor 1.

The item 28, "I do not procrastinate in studying," has the property of academic excellence, and its loading in Factors 5 and 3 were 0.48 and 0.45, respectively. Although the loading was higher in Factor 5, it was concluded that, theoretically, it was more related to Factor 3's property of academic excellence. Thus, it was included in Factor 3. Finally, item 37, "I actively participate in presentations or group assignments during lectures" related to students' faithfully and enthusiastically meeting academic demands. This was included in Factor 6, which was determined as more related to Factor 6's property of devotion to studying than to Factor 1's property of interpersonal relationships. Each factor was interpreted as (1) interpersonal relationships (nine items), (2) satisfaction with major (nine items), (3) ease of studying major (five items), (4) stress management (five items), (5) preparation for employment (three items), or (6) academic commitment (three items) (Table 1).

Confirmatory factor analysis was performed to examine the validity of six factor models. The estimates of model fit were as follows: CFI, NFI, and TLI values were 0.94, 0.86, and 0.93, and the RMSEA was 0.04 (Table 2).

4.2. Construct validity

To verify criterion-related validity, the Pearson coefficient for the scale of campus life adaptation among nursing undergraduates, which was developed in this study, as well as that of the college life adaptation scale (Jung and Park, 2009), was 0.79 ($p < .001$). Freshmen showed a significantly higher level of adaptation to campus life compared to students in higher academic levels (F = 6.33, $P < .001$). Depending on the major satisfaction levels, campus life adaptation was significantly higher in the "group of those satisfied" than in the "group of those who are not satisfied, or neutral." Moreover, it was significantly higher in the "group of those who are not satisfied" than in the "group of those who are unsatisfied" (F = 177.63, $P < .001$). Regarding level of campus life adaptation, the ratio of students who responded that there was moderate or no conflict in their interpersonal relationships was significantly higher than that of those who responded that they had severe conflict in their interpersonal relationships (F = 10.98, $P < .001$) (Table 3).

4.3. Reliability of the scales

In the current study, the Cronbach a value was 0.92, and its coefficient for subfactors was between 0.68 and 0.86. In the internal consistency test of questions on the campus life adaptation of nursing undergraduates scale, Cronbach's α values for the subfactors were all 0.6 or higher (Table 4).

5. Discussion

This study attempted to verify the components of nursing students' adaptation to campus life, develop an instrument for measuring adaptation levels to campus life, and evaluate the instrument's validity and reliability. The researchers hope to help promote an understanding of nursing students' adaptation levels by presenting a valid and reliable instrument with which to measure their adaptation to campus life.

It has been generally accepted that self-report measures should have a reliability of > 0.70 and/or 0.80 for them to be used as screening

tools (Nunnally and Bernstein, 1994). There was strong evidence of the criterion validity, with a correlation coefficient above 0.6 (Sung, 2002) between the campus life adaptation of nursing undergraduates and the college life adjustment scale. Regarding the score of the adaptation to campus life, there were significant differences among the participant groups according to their major satisfaction levels and their experiences of interpersonal conflict. The results of the mean differences among the groups revealed higher adaptation scores for freshmen compared to those in the higher academic levels. These findings have some concordance with Hoggan et al.'s (2016) study, which reported that students in their second year felt significantly more depressed, which led to their maladaptation to academic life. The transition to becoming a senior within a nursing major brings academic stress or burden due to the increasing complexity of the subject (McComb and Kirkpatrick, 2016; Labrague et al., 2017). Additionally, nursing students participating in clinical practice have more challenges in effectively building good interpersonal relationships compared to students of other majors, as they are faced with various environments such as clinical training sites for different clinical subjects. Therefore, they also have difficulties adapting to campus life even as juniors and seniors (Lee and Park, 2018).

Study results revealed that nursing students' adaptation to campus life is composed of the properties of "harmony in curriculum" and "harmony in personal and school activities." Associated factors were defined as interpersonal relationships, satisfaction with their major, ease of studying for their major, stress management, preparation for employment, and academic commitment. The six factor measurement models showed good fit indices. This would be in agreement with Cousins et al. (2017) in their classification of the adaptation of college students as academic adjustment, social adjustment, personal–emotional adjustment, and institutional attachment.

Among these, the subscale for interpersonal relationships is an important property that was revealed in that students need to form amicable interpersonal relationships with peers to successfully adapt to campus life (Iwata et al., 2014; Gibbons et al., 2011; Pulido-Martos et al., 2015). Based on Baker and Siryk's (1984) classification, this subscale would be social adjustment which reflects the degree to which a student integrates into the social structures of university residencies and the broader university, takes part in campus activities, meets new people, and makes friends(Cousins et al., 2017). From statements such as "As a nursing undergraduate, I have no difficulty in adapting to the culture of the nursing department," and "I get along well with fellow students of the opposite gender," it is obvious that nursing students experienced more conflicts in their interpersonal relationships when faced with female-oriented culture or gender-based stereotypes (Ashkenazi et al., 2017; Feng et al., 2016). This likely relates to the recent increase in male students at nursing colleges. Nursing students are required to have highly advanced expertise and skills, as well as interpersonal skills, to build constructive relationships with various counterparts after graduation. Such skills also have an important influence on students' adaptation to the nursing profession after graduation (Wang et al., 2015).

Academic adjustment shows the degree of student adaption to academic demands as reflected in their attitudes towards their course of study, their engagement with the material, and the adequacy of their studying and academic efforts (Cousins et al., 2017). The second, third, and sixth factors also reflect academic adjustment. Satisfaction with one's major was the second factor. Some nursing students choose the nursing major without consideration of their aptitude or interests due to the relatively high employment rate within the field (Wilkes et al., 2015). As time goes on, many of these students with external motivation have negative experiences in campus life due to their reduced satisfaction with their majors (Kim and Jang, 2012). Considering the nursing students' major satisfaction levels positively affected overall satisfaction levels with college life as well as personal values on professionalism and willingness to be nurses (Feng et al., 2016; Kim et al.,

Table 1
Factor analysis of final 34 items of Campus Life Adaptation Scale for nursing undergraduates.

Number	Items	Commonality	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
2	I like having conversation with fellow students.	0.64	0.78	0.13	−0.05	0.01	−0.01	0.08
4	I am in good relationship with senior and junior undergraduates of this major.	0.50	0.66	0.03	0.10	0.16	0.07	−0.15
10	I am satisfied with my personal relationship with other undergraduates of this major.	0.60	0.65	0.19	0.17	0.21	−0.08	0.24
11	I collaborate with fellow students to conduct group assignments.	0.50	0.63	0.05	0.11	0.18	−0.09	0.21
7	I have someone whom I can share my worries or concerns with.	0.43	0.60	0.02	−0.01	0.12	0.13	0.17
1	I easily get along with people I am newly acquainted with.	0.42	0.58	0.08	0.02	0.12	0.23	−0.09
8	I get along well with fellow students of the opposite gender.	0.38	0.54	0.20	0.10	0.14	0.13	−0.08
9	As a nursing undergraduate, I have no difficulty in adapting to the culture of nursing department.	0.45	0.49	0.33	0.30	0.03	0.10	0.02
57	I actively participate in the events related to my department	0.43	0.41	0.17	0.12	0.20	0.42	−0.09
20	I do not regret choosing this major.	0.66	0.15	0.79	0.02	0.03	0.00	0.07
21	I am considering whether I should continue or drop the nursing major.	0.67	0.10	0.76	0.05	0.05	0.13	0.23
42	I have a clear goal in studying nursing.	0.64	−0.01	0.69	0.10	0.20	0.27	0.20
22	I would recommend others to choose nursing as their major.	0.47	0.23	0.58	0.18	0.13	0.07	−0.19
17	I have a great aptitude for this major?	0.61	0.26	0.54	0.50	0.01	0.04	0.06
43	I strive to accomplish my goals after graduating university.	0.59	0.12	0.53	−0.08	0.28	0.34	0.32
33	I lack motivation to study in recent days.	0.40	0.10	0.51	0.30	0.09	0.09	0.13
24	I am worried if I could be a successful nurse.	0.37	0.09	0.51	0.26	0.17	0.03	−0.07
14	I am adapting well to the curriculum of the major.	0.66	0.50	0.50	0.35	0.14	0.08	0.13
29	I am satisfied with my academic records.	0.59	0.05	0.07	0.76	0.04	0.04	0.04
30	I have no difficulty in understanding the core lectures.	0.57	0.13	0.06	0.72	0.14	0.11	0.09
16	I have no difficulty in taking the curriculum of the nursing major.	0.54	0.20	0.23	0.64	0.10	0.09	0.11
35	I am efficiently managing time for study.	0.49	0.09	0.10	0.58	0.09	0.24	0.26
28	I do not procrastinate on studying.	0.57	0.08	0.15	0.45	0.01	0.48	0.32
45	I try to think in a positive way at all time.	0.58	0.18	0.20	0.01	0.71	0.05	0.05
50	I can retry when things do not go the way I expected.	0.54	0.14	0.05	0.09	0.69	0.17	0.09
49	When faced with hardship, I try to resolve it on my own first.	0.54	0.16	−0.10	0.09	0.68	0.09	0.18
46	I have an optimistic view of my future.	0.66	0.18	0.44	0.11	0.65	0.06	0.05
47	I cope well with stress from learning and campus life.	0.60	0.33	0.20	0.21	0.63	0.01	0.09
59	I strive to attain qualifications needed for employment.	0.64	0.07	0.10	0.08	0.04	0.77	0.15
58	I manage my time effectively to prepare for employment.	0.60	0.15	0.18	0.25	0.11	0.69	0.07
60	I work on attaining qualifications for foreign languages.	0.52	0.01	0.11	0.06	0.09	0.68	0.17
27	I diligently attend lectures.	0.65	0.07	0.16	0.11	0.08	0.17	0.75
34	I concentrate well on core lectures.	0.66	0.08	0.17	0.36	0.16	0.23	0.65
37	I actively participate in presentations or group assignments in lectures.	0.56	0.55	0.11	0.09	0.16	0.02	0.47
	Eigen values		9.18	2.65	2.25	1.75	1.52	1.38
	Explained Variance (%)		27.01	7.78	6.63	5.15	4.48	4.05
	Cumulative variance (%)		27.01	34.79	41.41	46.57	51.05	55.10

Grey coloured cells indicate items loading on factors.

6. Conclusion

Given the inclusion of only six universities in the sample, there were several limitations in the current study. The voluntary participant responses may have biased the study results. Additionally, the sample was mostly female and was exclusively composed of university nursing students in Korea. Despite these limitations, this newly developed measure demonstrated good psychometric properties and high evaluative reliability. This Campus Life Adaptation Scale will offer a framework for developing counseling and management strategies to help nursing students successfully adapt to campus life. Moreover, this study can contribute to helping nursing students successfully adjust to campus life and cultivate their talents within the public health and medical fields; this is accomplished by presenting future directions for enhancing personal competency in adaptation to campus life within the nursing education curriculum.

Declaration of Competing Interest

The authors declare that they have no competing interests.

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