

# A Study on the Relationship between Learning Self-Efficacy, Problem Solving Ability, and Communication Skills of Korean Nursing Students

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## Abstract

**Background/Objectives:** This study was attempted in order to identify the variables influencing the learning self-efficacy of nursing students. The participants of this study were 267 nursing students.

**Methods/Statistical Analysis:** To investigate the relationship between the main variables, correlation and regression analysis employed the SPSS/PC 22 program.

**Findings:** The results showed that there was a significant correlation between the main variables of the nursing students. Hierarchical regression analysis was performed to confirm the influence of major variables affecting learning self-efficacy. Results: Satisfaction with friendship, satisfaction with major, communication skills, and problem-solving ability of nursing college students were found to have a significant effect on learning self-efficacy. The explanatory power of related variables was 41.8%, while the problem solving ability was identified as the biggest influence factor ( $F=48.72$ ,  $p<.000$ ).

**Improvements/Applications:** In order to enhance the effectiveness of nursing education, it is important to improve the student's learning self-efficacy. This can be achieved through the development of communication skills and problem-solving ability, as well as satisfaction in friendship and in major.

**Keywords:** learning self-efficacy, problem-solving ability, communication skills, nursing students, satisfaction with friendship, satisfaction with major

## 1. Introduction

Nursing college education has recently emphasized the practical performance competence of students to cope with the rapidly changing socio-economic environment and employment structure, providing instruction based on learning outcome to allow students to exert their ability in clinical practice after graduation and lead a sustainable working life [1]. The learning outcome of nursing students is a critical aftermath that determines job performance and quality of employment. For this reason, Korea's nursing education institutions impart teaching geared at achieving learning outcomes effectively through an education certification system in which students can invest a significant amount of effort and energy in their entire academic duration.

However, nursing students complain of the overload and the stress that they receive from learning, as reported by previous research. The main stressors include the vast amount of learning, frequent examinations and tasks, and clinical practice stress; most of all, learning stress is repeatedly reported [2, 3, 4, 5]. Such stress causes students to experience anxiety or depression, along with physical and psychological health problems that negatively affect their quality of life [6]. It is therefore necessary for Korean nursing education institutions to give training and to develop learning strategies for students so that they can successfully achieve learning outcomes and perform a given role instead of suffering from excessive learning.

An individual's development is affected by numerous factors. Self-efficacy, a belief in one's own ability, is more likely to serve as an important factor in youth than in any other period as it is the time when one needs to establish self-identity and values in rapidly changing social competition [7]. Self-efficacy means a decision on and belief in one's own ability to embody successful behavior in an attempt to obtain a certain result [8]. In other words, it refers to a personal decision on whether one is able to deal with a certain situation [7]. Thus, self-efficacy serves as a driving force for students to perform a given task efficiently and functions as an effective resource to improve academic performance. An instructor therefore needs to become aware of how self-efficacy affects academic performance and must strive to develop a teaching method that will improve learning outcomes.

As reported in completed research, self-efficacy allows learners to adjust their academic performance and learning process. Students with better self-efficacy study a variety of nursing situations, acquire exploration methods, and gain professional thinking by solving nursing problems positively and evaluating their own practical experiences [9]. Another research found that nursing students with

better self-efficacy experienced less employment stress than those with poorer self-efficacy [10], implying that self-efficacy is an essential variable of academic performance for students. Nurses need to learn a combination of theoretical and practical knowledge and give appropriate nursing for a target situation for the purpose of whole-person nursing. Successful performance of a task requires an ability to deal with a situation with confidence in their own behavior; therefore, it is necessary to give educational stimuli that can improve self-efficacy among students.

On the basis of the report in previous research, learning self-efficacy is the concept an instructor needs to regard as important to allow students to achieve academic performance successfully. To do this, it is necessary to apply a specific method within a curriculum. Giving and managing education aimed at better self-efficacy by reducing the academic stress students complain of and by allowing them to achieve positive learning outcome are, therefore, crucial tasks for an instructor.

The research on self-efficacy among nursing students addressed the comparison of self-efficacy before and after the application of a simulation education method [11], the association among clinical practice stress, self-efficacy, and self-esteem [5], the effects of self-evaluation learning on self-efficacy as found in video-taping [12], the consequences of practical training for nursing students through the application of standardized patients [9], and the effects of self-efficacy and self-directed learning on their life satisfaction [13]. It primarily focused on the association between self-efficacy and other variables, with little research being conducted on the factors influencing self-efficacy.

This study thus aimed to identify self-efficacy and the factors affecting it and to determine the specific influence of relevant variables among nursing students. The variables for the factors are used to determine the association among relevant variables on the basis of the contents in existing regular education. The basic competencies required to exert competence fully as a nurse, as emphasized repeatedly through curriculums in the previous research, were problem-solving ability and communication skills [14], whereas the association between these two variables and self-efficacy was analyzed and the part for college life satisfaction, which was confirmed as a factor affecting self-efficacy in the previous research [7], was included to determine if it served as a factor affecting self-efficacy among nursing students.

Nursing is a job in which the ability to solve problems effectively in each situation on the basis of accurate, quick, and analytical judgment, with the aim of meeting great health-related needs of the target, is crucial [15]. Communication skills are addressed in relation to this variable and are crucial competence that is essential to the maintenance of mutually cooperative relationships with the medical staff and problem-solving at clinical sites, determining the quality of nursing. For this reason, nursing education institutions put emphasis on the continuous improvement of these two competencies, as well as on their practical application for students. Therefore, this study intends to determine how problem-solving ability and communication skills are associated with self-efficacy, whether the two variables contribute to the improvement of self-efficacy among students, and if basic data are needed to create a teaching environment. The results of this study are expected to help identify the factors for self-efficacy affecting learning outcomes among nursing students, to create a teaching environment, to take relevant variables into account, and to improve the quality of education.

## **2. Materials and Methods**

### **2.1. Research design and model**

This is descriptive research aimed at identifying the variables affecting the learning self-efficacy of nursing students.

### **2.2 Subjects and data collection**

Data were collected from the nursing students in South Korea, who gave consent to research participation. The data collected from 267 participants were based on a structured questionnaire, and these data were statistically analyzed to gather findings. The data collection was performed from November to December 2019. The data were marshaled from those students who were given explanation by the researcher and who gave consent. They were notified that all data related to the research would be kept anonymous and that refusal to participate in the research would lead to no disadvantage before the performance of research.

### **2.3 Statistical method**

An SPSS 22 program was used to determine the impact of the general characteristics, communication skills, and problem-solving ability on learning self-efficacy among the participants. Such statistical techniques as frequency analysis, correlation analysis, and hierarchical regression analysis were used to determine the results that met the purpose of this study.

### **2.4 Survey tools**

To determine the purpose of this study, the following questions and tools for the general characteristics were used:

#### **2.4.1. Characteristics of the subject**

A five-point Likert scale from 1 (*very dissatisfied*) to 5 (*very satisfied*) was used to measure satisfaction with major and friendship among the general characteristics; the higher the score was, the more satisfied a respondent was.

### 2.4.2. Learning self-efficacy

The tool developed by Ayres [16] and translated by Park et al. [9] was used to measure learning self-efficacy. This study had a reliability of .95, with personal belief in the ability to use what was learned being measured in a total of 10 items. It was measured on a 7-point Likert scale from 1 (*totally disagree*) to 7 (*totally agree*); the total score ranged from 10 to 70, with a higher score meaning a higher level of learning self-efficacy. Reliability was estimated at .95 both in Park et al. [9] and in this study.

### 2.4.3. Problem-solving ability

The tool developed by Lee et al. [17] for college students and adults was used to measure problem-solving ability in terms of five elements: problem clarification, cause analysis, alternative development, planning and implementation, and performance evaluation.

This tool consists of a total of 45 items on a five-point Likert scale from 1 (*very rarely*) to 5 (*very often*). A possible total score ranges from 45 to 225, with a higher score meaning better problem-solving ability. This tool had reliability estimated at .94 both at the time of development and in this study.

### 2.4.4. Communication skills

The communication ability diagnosis tool developed by Lee et al. [17] for college students and adults was used to measure communication skills. This tool consisted of 49 items for five ability elements: interpretation, role performance, self-presentation, goal-setting, and message conversion. They were measured on a five-point Likert scale from 1 (*very rarely*) to 5 (*very often*). A possible total score ranged from 49 to 245, with a higher score meaning better communication skills. To prevent any response bias, 13 of these items were constructed as negative ones and reversely coded in statistical processing. The communication ability tool had reliability estimated at .80, when Lee et al. [17] developed it, and at .88 in this study.

## 3. Results

### 3.1. General characteristics of subject

The general characteristics of the nursing students in this study are as presented in Table 1. The mean age was 25.35 years, with 244 students (91.4%) in their twenties, 15 (5.6%) in their thirties, and 8 (3.0%) in their forties. The higher percentage of the students in their twenties or older indicates the recent trend of nursing students in South Korea where more and more students major in nursing late in life. There were more women than men in this study: 244 (91.4%) and 23 (8.6%), respectively. The participants showed high levels of academic achievement, with 21 students (7.9%) being *very satisfied* with academic achievement, 100 (37.5%) being *satisfied*, and 119 (44.6%) indicating *so-so*. They generally showed high levels of major satisfaction: 47 students (17.6%) were *very satisfied*, 137 (51.3%) were *satisfied*, and 73 (27.3%) indicated *so-so*. They showed high levels of peer relationships: 67 students (25.1%) were *very satisfied*, 136 (50.9%) were *satisfied*, 59 (22.1%) indicated *so-so*, 5 (1.9%) were *dissatisfied*, and no one was *very dissatisfied*. At least 90% of the respondents showed satisfaction with peer relationships, major, and academic achievement at the average or higher level. The mean was 3.43 for academic achievement, 3.82 for satisfaction with major, and 3.99 for satisfaction with friendship.

**Table 1. General Characteristics of Subject (n=267)**

Characteristics	Categories	n(%)	M±SD
Age	22-29	244(91.4)	25.23±5.12
	30-39	15(5.6)	
	≥40	8(3.0)	
Gender	male	23(8.6)	-
	female	244(91.4)	
Academic achievement	very satisfied	21(7.9)	3.43±.78
	satisfied	100(37.5)	
	moderate	119(44.6)	
	unsatisfied	26(9.7)	
	very dissatisfied	1(0.4)	
Satisfaction with major	very satisfied	47(17.6)	3.82±.76
	satisfied	137(51.3)	
	moderate	73(27.3)	
	unsatisfied	9(3.4)	

	very dissatisfied	1(0.4)	
Satisfaction with friendship	very satisfied	67(25.1)	3.99±.74
	satisfied	136(50.9)	
	moderate	59(22.1)	
	unsatisfied	5(1.9)	
	very dissatisfied	-	

### 3.2. Respondents' problem-solving ability, communication skills, and learning self-efficacy

The mean of problem-solving ability, communication skills, and learning self-efficacy for the respondents is presented in Table 2. They scored an average of 3.65 out of 5 for problem-solving ability, 3.65 out of 5 for communication skills, and 5.73 out of 7 for learning self-efficacy. As for the mean of the combined variables, they scored 164.18 for problem-solving ability, 178.89 for communication skills, and 57.33 for learning self-efficacy.

**Table 2. The Degree of Problem-solving ability, Communication skills, Learning self-efficacy of Subject (n=267)**

Variable	Item	Item	Total
		M±SD	M±SD
Problem-solving ability	45	3.65±.42	164.18±19.05
Communication skills	49	3.65±.36	178.89±18.02
Learning self-efficacy	10	5.73±.77	57.33±7.75

### 3.3. Analysis of correlation among problem-solving ability, communication skills, and learning self-efficacy for respondents

Correlation analysis was performed among such general characteristics of the respondents as major satisfaction, satisfaction with friendship, problem-solving ability, communication skills, and learning self-efficacy, whereas significant correlation was found among the principal variables, as presented in Table 3. Learning self-efficacy was positively correlated at average or higher levels with satisfaction with major ( $r=.322$ ,  $p<.000$ ), satisfaction with friendship ( $r=.351$ ,  $p<.000$ ), problem-solving ability ( $r=.570$ ,  $p<.000$ ), and communication skills ( $r=.492$ ,  $p<.000$ ). These results have confirmed the possibility of regression analysis among principal variables.

**Table 3. Correlations between Learning self-efficacy and major variables (n=267)**

Variables	Pearson Correlation (p)				
	a)	b)	c)	d)	e)
a) Satisfaction with major	1				
b) Satisfaction with friendship	.388 ( $<.000$ )	1			
c) Problem solving ability	.167 (.003)	.148 (.008)	1		
d) Communication skills	.153 (.006)	.283 ( $<.000$ )	.656 ( $<.000$ )	1	
e) Learning self-efficacy	.322 ( $<.000$ )	.351 ( $<.000$ )	.570 ( $<.000$ )	.492 ( $<.000$ )	1

### 3.4 Factors affecting respondents' learning self-efficacy

Regression analysis was performed with learning efficacy as a dependent variable while the other variables serve as independent variables to determine the effects of major satisfaction, satisfaction with friendship, problem-solving ability, and communication skills on learning efficacy. The resultant Durbin-Watson statistics of 2.075 confirmed that there was no problem with self-correlation among independent variables, satisfying both the assumption of regular distribution and homoscedasticity of regression standardized residuals. The variance inflation factor (VIF) was all equal to or below 10, indicating no problem with multicollinearity among independent variables.

The regression formula was significant ( $F=48.72$ ,  $p<.000$ ) and the independent variables were all significant influential factors

(Table 4). The standardized coefficient ( $\beta$ ) was .428 for problem-solving ability, .188 for satisfaction with friendship, .158 for major satisfaction, and .133 for communication skills, with the independent variables exerting an influence of 41.8% and showing considerable explanatory power. Among the principal variables, problem-solving ability, followed by satisfaction with friendship, satisfaction with major, and communication skills, had the greatest impact. In other words, the higher the problem-solving ability, satisfaction with friendship, satisfaction with major, and communication skills the nursing students had, the better the learning efficacy they possessed.

**Table 4. Influencing Factors on Learning self-efficacy (n=267)**

Independent Variables	Model				
	B	SE	$\beta$	t (p)	VIF
Constant	4.501	3.990	-	1.128 (.260)	-
Satisfaction with major	1.593	.517	.158	3.082(.002)	1.196
Satisfaction with friendship	1.971	.550	.188	3.581 (<.000)	1.263
Problem solving ability	.174	.025	.428	6.853(<.000)	1.785
Communication skills	.057	.028	.133	2.080(.039)	1.876
Statistic results	R <sup>2</sup> =.427, Adjusted R <sup>2</sup> =.418, F=48.72, p<.000, Durbin-Watson=2.075				

## 4. Discussion

This is descriptive research with design based on the literature review regarding the self-efficacy of nursing students and is aimed to obtain basic data necessary to build a strategy of reducing academic stress among the said students. Specifically, it aimed to determine the relations and influence among their general characteristics, learning self-efficacy, problem-solving ability, and communication skills, with the objective of exploring the principal variables affecting their learning self-efficacy.

They were satisfied with their major and peer relationships at average or higher levels, scoring 3.82 and 3.99 out of 5, respectively. They scored 57.3 for learning self-efficacy as a dependent variable, which was higher than 52.4 in Park et al. [9] who applied the same tool. They had average or higher levels of learning self-efficacy, scoring an average of 5.73 out of 7.

They scored 3.65 out of 5 for problem-solving ability, which was higher than 3.10 for general college students in Lee et al. [17] who applied the same tool. These differences needed to be interpreted, taking different curriculums into account. Nursing students had better problem-solving ability than other majors in that the curriculums for nursing students put greater emphasis on problem-solving ability than those for general college students, addressing this skill across the curriculums through a diversity of relevant teaching contents. It is necessary to reconfirm statistically significant differences in pursuit of accurate evaluation, however, through comparison in problem-solving ability between general college students and nursing students. The nursing students scored 3.50 for problem-solving ability in Kim et al. [18], who applied the same tool, and 3.44 in Ji et al. [19], both of which were lower than in this study. These differences were probably due to the effects of learning outcome on the results by grade, despite research in the same nursing students. In other words, this study was conducted among seniors and by Kim [18] and Ji [19] among lower-grade nursing students, who scored lower for problem-solving ability because they failed to learn it fully; therefore, further research should be conducted to determine if the higher the grade the nursing students have, the better the problem-solving ability they have.

They scored 3.65 out of 5 for communication skills, which was slightly higher than 3.54 in Kim et al. [18] and 3.51 in Ji et al. [19], both of whom applied the same tool. This difference seems to be due to the variation by grade of the participants, who scored for communicative competence at the level of seniors, while Kim et al. [18] and Ji et al. [19] were conducted in lower-grade nursing majors, showing differences in communication skills by grade. It is necessary to reconfirm it through comparative research in each grade of nursing students exposed to the same curriculum with the aim of determining if there is any statistically significant difference.

When the factors for learning self-efficacy of nursing students were analyzed on the basis of the correlation analysis among principal variables, satisfaction with major, satisfaction with friendship, communication skills, and problem-solving ability were found to be influential variables, of which the most influential one was problem-solving ability, followed by satisfaction with friendship, satisfaction with major, and communication skills. Problem-solving ability is highly emphasized in curriculums and is basic practical competence that nursing students need to acquire to solve problems efficiently in clinical practice. Colleges allow students to reinforce their competence by taking various subjects by stages in pursuit of better problem-solving ability. This study has confirmed that the education for reinforcing problem-solving ability contributes to the improvement in learning self-efficacy for students; that is, the regular nursing curriculums have already addressed teaching contents that can improve learning self-efficacy, and the students who follow them and cooperate well can see their learning self-efficacy improve with grade.

What is noteworthy in the results is that such variables as major satisfaction and satisfaction with friendship have a greater impact on learning self-efficacy than communication skills does. In other words, major satisfaction and satisfaction with friendship in the

area of personal life were found to be variables influencing learning self-efficacy, which is consistent with what Hong [7] reported about female college students. The more satisfied with major and friendship students are in college life, the more positive attitude they have toward academic work and the better at managing academic stress they are. Therefore, instructors need to provide educational stimuli so that students can establish good values of major and become satisfied with their own choice; they also need to manage the educational environment so that students can form good peer relationships. Such an effort is expected to allow students to feel more satisfied with their major, improve their learning self-efficacy, become more active in fulfilling their tasks, and improve their learning outcome. Therefore, nursing education institutions need to build efforts to cultivate problem-solving ability and communication skills within the regular curriculums with the aim of improving learning self-efficacy, enhancing both satisfaction with major and satisfaction with friendship, relieving college life stress and academic burden, and achieving successful learning outcome.

This study is significant by confirming that the factors for the learning self-efficacy of nursing students were largely divided into the learning factors within the regular curriculums and those in the area of personal life and that relevant factors were influential at the same time. In other words, while the regular curriculums for achieving the educational goal are important, it is also necessary to create an educational environment in which students can have a generally positive learning environment. To do this, it is essential to operate a systematic curriculum and provide education for establishing work values of the major. It is also necessary to build a consumer-centered education system that positively accepts and reflects students' opinions as to school administration and the general teaching system and gives educational administrative service with the objective of clearing conflict factors among students. The support with the intra- and extra-subject educational environment can relieve the academic burden and stress from nursing students and ultimately improve their learning outcome.

In conclusion, this study explored the factors for learning efficacy to reduce the academic stressors for nursing students. It found that problem-solving ability and communication skills within the regular teaching contents affected learning self-efficacy and that satisfaction with major and satisfaction with friendship in the area of personal life were more influential than communication skills. Therefore, nursing education institutions need to provide education continuously for problem-solving ability and communication skills, as addressed in the regular curriculums. They should ensure that students will be more satisfied with the major of nursing as a strategy for improving their learning self-efficacy more effectively, and they should allow them to become more satisfied with friendship by controlling conflict factors among students. Such efforts made by colleges can lead to an improvement in academic performance among students.

## 5. Conclusion

This study aimed to explore the factors for learning self-efficacy among nursing students and found that learning self-efficacy was affected by problem-solving ability, satisfaction with major, satisfaction with friendship, and communication skills; these variables have a remarkable explanatory power of 41.8%. In conclusion, nursing education institutions should allow students to improve their learning self-efficacy as a strategy of achieving learning outcomes successfully. To do this, they need to implement a teaching strategy of improving students' problem-solving ability, communication skills, satisfaction with major, and satisfaction with friendship. The period of college life among the stages of human development is characterized by the burden of a competitive social environment given developmental task, as well as by psychological stress due to an uncertain future. In particular, nursing students suffer a great burden of academic performance related to their major and are exposed to considerable stress. To solve these problems, instructors need to allow students to improve their learning self-efficacy and help them lead a successful campus life. Therefore, it can be said that this study has made a highly meaningful approach to the efforts to build a consumer-centered educational environment by exploring and identifying the factors for learning self-efficacy in nursing students.

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