

# Factors affecting the results of national nursing license examination among newly graduated nurses in a private nursing college, Thailand: A mixed methods research

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## ABSTRACT

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This research aimed to study the factors affecting the results of national nursing license examination among newly graduated nurses by applying a mixed methods approach. The sample consisted of 113 newly graduated students from Saint Louis College in Thailand in the academic year of 2018. Data were collected through questionnaire, group discussion, and in-depth interview. Quantitative data were analyzed with regression method, whereas the qualitative data were analyzed using content analysis. The results of this study showed that 65 (57.52%) newly graduated nurses passed the national nursing license examination in all subjects during the first round. Cumulative grade point averages (GPA) and the results of the comprehensive examination predicted the results of the national nursing license examination ( $p < 0.05$ ). Qualitative data indicated the students' motivation for exam preparation comes from a sense of responsibility toward their family and peer pressure, and the most common reason for failing the exam was due to recklessness. The students stated that the preparation program for the exam was suitable. Factors that led to passing the national nursing license examination were help from friends, time management, and personal characteristics. However, the libraries, dormitories, and activity spaces were not conducive to exam preparation.

**Keywords:** predicting factors; national nursing license examination; new graduated nurses; mixed methods research

## 1. INTRODUCTION

The Thailand Nursing and Midwifery Council (TNMC) has an obligation to maintain nursing education standards, assure the profession's quality, and protect health service

recipients. To achieve these missions, TNMC has set up the national nursing license examination for registering professional nurses and first-class midwives. The result of the examination is an essential criterion for accrediting nursing institutions as well. Each institution must have an

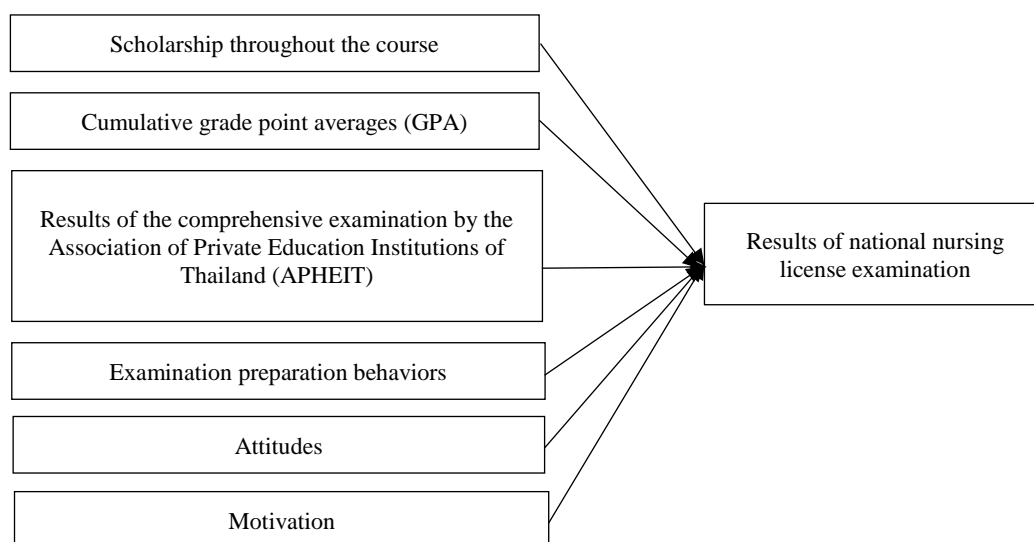
average score of not less than 70%. In 2018, results of the first-time registered nursing students at Saint Louis College of Nursing were 116. In total, 66 (56.90%) students passed all eight subjects and 31 (26.72%) students passed seven subjects (Oatme et al., 2018). When studied in detail, for students who passed seven subjects, the most commonly failed subject was midwifery with 12 failed students. The second-most failed subject was child and adolescent nursing with 9 failed students, followed by maternal-child nursing with 5 failed students, law with 3 failed students, and adult and aging nursing with 1 failed student each.

Overall, from the three national nursing license examinations taken by Saint Louis College of Nursing graduates, the average score of every course from the institute was above the national average score (TNMC, 2018). This is a satisfactory statistic for the institute to produce qualified registered nurses. Nevertheless, the Faculty of Nursing, Saint Louis College, wants to increase the number of passing nursing graduates in the first national nursing license exam. Therefore, it has continuously improved the preparation program for fourth-year students to prepare for the examination. In 2018, Oatme et al. studied the related factors affecting the result of the nursing and midwifery licensure examination of the graduate students from Saint Louis College of Nursing and found that the results of the comprehensive exam by the Association of Private Education Institutions of Thailand (APHEIT) had a positive relationship with the national nursing license examination results ( $p < 0.01$ ). Monroe (2019) conducted a similar study to determine students' readiness to take the national council licensure examination for registered nurses from universities in the Midwestern

United States between May 2016-May 2018. The findings indicated the Kaplan RN Readiness Exam accurately predicted pass rates of the NCLEX-RN examination ( $p < 0.05$ ). Moreover, a systematic review of studies published between 1984 and 2015 examined the relationship between undergraduate nursing program performance and NCLEX-RN examination results (Sears et al., 2015). The review showed that academic and cognitive factors, particularly critical thinking skills, were strong predictors for NCLEX-RN success, whereas stress and highly negative emotions inversely correlated with NCLEX-RN success.

A review of the literature indicated that most studies have focused on a quantitative measurement of factors affecting the results of national nursing license examination, whereas few have studied the issue qualitatively. Therefore, this study aimed to identify and explore the factors affecting the results of the examination in the context of newly graduated nurses from Saint Louis College. A mixed methods approach was chosen because the results could then be used to develop the format of the preparation program to suit the needs of the graduating students. Ultimately, this would enable more students to pass the first round of examination for eight subjects and pursue a career in the nursing profession.

The conceptual framework (Figure 1) of this research was developed from various forms of evidence. The predictive factors were scholarship throughout the course, cumulative grade point averages (GPA), results of the comprehensive examination by APHEIT, examination preparation behaviors, attitude and motivation that lead to passing the registration examination (Kunaviktikul et al., 2012; Thongsong and Pongsananurak, 2015; Jamjan et al., 2015; Kongyoo, 2017; Oatme et al., 2018).



**Figure 1.** Conceptual framework

## 2. MATERIALS AND METHODS

This descriptive research applied a mixed methods approach by using an explanatory sequential design that started by collecting and analyzing quantitative and then qualitative data in consecutive phases (Wipulanusat et al., 2020). A total of 113 students were randomly selected for the quantitative study. Inclusion criteria consisted of

graduate nursing students of the 31<sup>st</sup> group from the bachelor of nursing science program in the academic year 2018, who had participated in the college's exam preparation program for the national nursing license examination, and who were able to participate in the examination and voluntarily participate in this research. For the qualitative study, the subjects were selected using a purposive sampling technique of students who had failed one course

of the comprehensive exam by APHEIT. Twenty-three students participated in the group discussion and seven students completed in-depth interview.

Data collected in the quantitative phase consisted of the participants' personal data, such as gender, age, and the following predictive factors affecting their results of the registration exam: (a) scholarships received throughout the program; (b) GPA before enrolling in the institute and throughout the bachelor of nursing program; (c) the result of passing eight subjects—the criteria for passing the exam is achieving a score of 60% or more for each subject; (d) examination preparation behavior based on 14 questions answered on a 5-point scale; (e) attitude based on 10 questions answered on a 5-point scale and (f) motivation for achievement based on 7 questions answered on a 5-point scale. Data were analyzed using statistic frequency distribution to determine percentages, averages, and standard deviations. Multiple correlations were used to determine the relationship between the factors and the results of the national nursing license examination, and regression and the statistical assumption of regression (i.e., linearity, homoscedasticity, independence, normality, and multicollinearity) were tested without a violation of assumptions to determine the predictive factors affecting the results of the examination.

For the qualitative study, the researcher used questions designed for group discussion and in-depth interview relating to motivation for exam preparation, reasons for failing the exam, the suitability of the institution's preparation program, and internal and external factors of the sample that lead to passing the national nursing license examination. Data from the group discussion and in-depth interview were analyzed using thematic analysis and data triangulation technique to ensure trustworthiness.

Prior to data collection, the researcher explained the purpose of the study to the participants and their right to withdraw from the study at any time without consequence. All participants provided written consent to voluntarily provide information for the study. The researcher also explained that their information would be kept privately and securely. The Research Ethics Committee of Saint Louis College endorsed this research project (Certificate No. E.010/2019 approved on March 5, 2019).

### 3. RESULTS AND DISCUSSION

The sample consisted of 109 female and 4 male participants with the ages between 20 and 25 years. The GPA of the students before and after enrolling in the bachelor of nursing program was 3.33 and 3.01, respectively. Regarding scholarships throughout the program, 71 students received scholarships from private hospitals and 42 students were self-funded. The comprehensive exam results by APHEIT indicated 28 students (24.78%) passed seven to eight subjects. Overall, exam preparation behavior had an average score of 3.26. Of the factors considered, joining extra classes for reviewing from the lecturer/experts had the highest average, followed by physical strength for test preparation, and mental, emotional, and social readiness during the preparation period. Reviewing the content for the exam with friends in small groups of five to six people had the lowest average score. The researchers found that 90 of the participants (79.6%) were stressed over these top three issues: worrying

that they would fail the exam, a lack of concentration for reviewing the knowledge, and insomnia. Of the 23 (23.4%) students who reported little or no stress, trying to relax the mind, having enough time for preparation, and passing the comprehensive exam resulting in higher confidence were the most common answers as to how they coped during exam time.

Concerning attitude and inspiration toward the exam, the three highest rated factors were increased income and a good start of the profession, followed by the expectations for passing eight subjects in the first round, having higher self-esteem, and working with dignity. Motivation from seniors and friends had the lowest average. Concerning motivation for achievement toward exam preparation, the three highest rated factors were being determined to pass all subjects of the exam, followed by setting a goal of passing all subjects in the first round of the exam, proper preparation will result in passing all subjects in the exam, and this exam is vital in their life. Intending "If I do not understand something in the subject, then I will find out and ask the experts" had a high average rate. The results of the national nursing license examination of the 113 students are shown in Table 1.

**Table 1.** Number of subjects passed from the national nursing license examination

Number of subjects	Number of passed students	Percentage
2	1	0.88
5	3	2.65
6	18	15.93
7	26	23.01
8	65	57.52
Total	113	100.00

The results of the correlation coefficient analysis between the factors that related to the results of the exam (Table 2) showed that scholarship throughout the course, cumulative GPA, results of the comprehensive examination by APHEIT, examination preparation behaviors, attitude and motivation that lead to passing the registration examination have a positive relationship with the result of the exam ( $p < 0.05$ ).

Predictive factors of the results of national nursing license examination were cumulative GPA and results of the comprehensive exam by APHEIT ( $p < 0.05$ ) (Table 3)

The mixed methods results indicated two factors affected the results of the national nursing license examination: GPA and the result of the comprehensive exam by APHEIT ( $p < 0.05$ ). Concerning GPA, this result is consistent with the research of Wattananon et al. (2011) who studied factors predicting the results of the national nursing license examination in 2010. This is also in line with the research of Kongkar et al. (2012), who studied factors that influenced passing rates of the comprehensive exam to receive a license as a registered nurse and first-class midwife from the Faculty of Nursing, Mahidol University. Kongkar et al. (2012) found that GPA could accurately predict exam results by 80.5%. Boonprayong et al. (2014) reported the results of the registration exam based on the predictive factor of educational achievement at Boromarajonani College of Nursing Chakri Rat. Their results indicated that all students with a GPA of 3.5 or higher passed the exam. Moreover, Thongsong and Pongsananurak (2015) also found that GPA could predict

47.2% of the results of the registration exam. Since Saint Louis College provides multiple scholarships, it can recruit students with good academic background to continue their

studies, which translates to a high GPA throughout the degree and positive results on the national nursing license examination.

**Table 2.** The results of correlation coefficient analysis

Variables	X1	X2	X3	X4	X5	X6	Y
X1	-	0.339*	0.161*	0.128	0.049	0.040	0.161*
X2		-	0.339*	0.339*	0.135	0.113	0.538*
X3			-	0.185*	0.050	0.034	0.473*
X4				-	0.425*	0.334*	0.268*
X5					-	0.629*	0.220*
X6						-	0.107
Y							-

Note: \* $p$ -value<0.05, X1=Scholarship throughout the course, X2=Cumulative grade point averages (GPA), X3=Results of the comprehensive examination by the Association of Private Education Institutions of Thailand (APHEIT), X4=Examination preparation behaviors, X5=Attitudes, X6=Motivation, Y=Results of national nursing license examination

**Table 3.** The results of predictive factors

Variables	b	SE <sub>b</sub>	$\beta$	t	p-value
X1	-0.040	0.244	-0.014	-0.164	0.870
X2	1.154	0.340	0.366	3.398	0.001*
X3	0.139	0.058	0.237	2.400	0.018*
X4	0.086	0.165	0.048	0.520	0.604
X5	0.410	0.232	0.186	1.765	0.080
X6	-0.190	0.259	-0.074	-0.731	0.466

R = 0.593, R<sup>2</sup> = 0.352, F = 9.595\*, SE<sub>est</sub> = 0.815

Note: \* $p$ -value<0.05, X1=Scholarship throughout the course, X2=Cumulative grade point averages (GPA), X3=Results of the comprehensive examination by the Association of Private Education Institutions of Thailand (APHEIT), X4=Examination preparation behaviors, X5=Attitudes, X6=Motivation, b=unstandardized beta, SE<sub>b</sub>=standard error for the unstandardized beta,  $\beta$ =standardized beta, t=t-test statistic

The results of the comprehensive exam by APHEIT were also used to predict the results of the national nursing license examination. This is in accordance with Wattananon et al. (2014) who studied factors predicting the results of the comprehensive exam for a license to practice nursing and midwifery of the graduate year 2012-2013, and with Kongyoo (2017) who studied the factors predicting the results of the registration and licensing exam as a professional nurse and first-class midwife of students from the Army College of Nursing. Our results are similar to these studies because the comprehensive exam of APHEIT is based on the blueprint of the exam given by the Nursing Council.

Monroe (2019) studied student readiness to take the national council licensure examination for registered nurses. The results indicated that the Kaplan RN Readiness Exam accurately predicted pass rates of the NCLEX-RN examination with 95% confidence. However, the found students reported anxiety leading up to the NCLEX-RN. Sears et al. (2015) further found that stress and highly negative emotions inversely correlated with NCLEX-RN success. To address student anxiety, the content of each subject is within a similar scope and the preparation program offers several mock exams before the actual comprehensive exam, which allows the students to identify their weaknesses in each subject and improve before taking next exam. Overall, the comprehensive exam by APHEIT prepares students well for the national nursing license examination and is why the two exams have a positive relationship in our results.

One factor that was unable to predict the results of the national nursing license examination was scholarships received throughout the program. However, this quantitative result differs from qualitative data from the interviews, especially those who received a scholarship with the condition that they will not be allowed to enter the practical component of their degree if they fail the exam. This condition pressured scholarship students to pass the national nursing license examination in the first round. As one student explained:

"I have a 1-month internship for professional experience in the second half of my 4<sup>th</sup> year at the ICU department of the funding hospital. The seniors in the department said that if I don't pass the exam, I won't be allowed to do some practices with the patients. This condition motivated me to pass the exam because I have to go back and work in the trained department." (ID1)

Another reason mentioned was the counted time for repaying the scholarship. The following student described how this would be a waste of their time:

"The first thing is the scholarship. Because they count the amount of time for repaying the scholarship only after passing the registration exam; if you don't pass the first round, the working hours won't be counted yet. It is such a waste of time. Eight years of repaying the scholarship is very long for me." (ID2)

Concerning preparation behavior, some students commented during the interviews and discussion group that they do not fully prepare for the exam because they lack motivation. As one student stated:

"I begin to read seriously just before taking the APHEIT exam. Earlier, it's on and off. I just read casually. I was most serious with the APHEIT exam. If I ran out of time for reading, I would find some summaries to read. I focused more on doing the mock exams though." (ID4)

In contrast, one student did not prepare for the comprehensive exam as a way to determine their current state of knowledge. This tactic appears to benefit some students, as they are able to take multiple mock exams and use them as a method of preparation:

"I seriously started reading books one week before the exam. I don't read anything at all before that. However, when I went to take the first round without reading, I know how much studying I have left for that subject." (ID3)

These results align with those of Jamjan et al. (2015) who explored the attitudes and inspiration of the nursing students at Saint Louis College for preparing for the national nursing license examination. The authors found that students who did poorly on the examination were those who did not read documents/textbooks before taking the exam, complete the activities as scheduled, or review knowledge while practicing. In contrast, other students stated that they were motivated to prepare for the exam so they could pass all eight subjects at the first time and receive the license fee. This result is consistent with the qualitative study of Dumrongpakapakorn et al. (2013) who found the first round of the exam is important to the students themselves, their family, and society, and is seen as the beginning of a career path with standard quality. From the interviews, it found that students were motivated to pass the first round of the exam because their fresh knowledge right after graduation would help them pass the exam sooner rather than later:

"I want to pass the first round because I worried that when time has passed, my knowledge will not be as good as when I just graduated. Moreover, if working at the same time, I won't be able to read the book and the knowledge will dissipate. Taking the next round of the exam will be very tiring." (ID6)

"The license fee. Also, I will be more accepted when going to work, which motivates me to pass the first round." (ID7)

However, the interviews and group discussion indicated that stress was a factor related to exam preparation and often had a negative impact. From the interviews, students described both personal stress and stress related to their work. When asking about their stress and how they manage, students highlighted the following:

"The stress affected me because I fought with my mother 2 days before the exam, so my stress increased. There was also the worry about teaching. However, I know what I need to do first and try to eliminate other feelings to focus on reading and preparing for the exam." (ID5)

"I was very stressed because I needed to go to work for the scholarship repayment as well. I needed to adjust myself with work, colleagues, and there was also the exam. I didn't know what I need to do first, but I had to cut all of the strayed thoughts out because the exam is important" (ID2)

In this study, attitude and inspiration did not predict the results of the exam. This is in contrast with the quantitative research of Kongyoo (2017) and Thongsong and Pongsananurak (2015) who found a predictive factor for the result of passing the exam was the students' attitudes toward the exam. Jamjan et al. (2015) found that students' inspiration for passing the exam are pride and self-esteem, which aligns the qualitative study of

Dumrongpakapakorn et al. (2013) who studied students' preparation behavior for the registration exam from Boromarajonani College of Nursing, Nakhon Phanom. The students indicated they see the exam as a mark of success and the essential starting point of becoming a professional nurse with quality standards. Moreover, Kunaviktikul et al. (2012) found that cultivating an attitude to see the importance of the registration exam was an important predictive factor for exam success. Several participants mentioned feelings of success and pride in their accomplishment in the interviews:

"It's pride and confidence that we have obtained the professional license for working in other hospitals. If we don't pass, it's just like a friend said that the scope of work will be the same as working as an assistant nurse even though we graduated from a nursing institute, making us lose our pride. It's not suitable for someone who graduated from nursing." (ID6)

"The registration exam is our profession's security. If you don't pass, and without a license, then you don't have a confidence for providing nursing." (ID3)

"I want to pass the first round because of my parents. Because, if I pass, then they will be proud that I can pass the registration exam in the first round." (ID1)

## 4. CONCLUSION

Factors being identified to predict the results of the national nursing license examination were GPA throughout the course and the comprehensive exam by APHEIT ( $p < 0.05$ ). Future work should focus on exploring systematic preparation for the national nursing license examination to develop the required resources for newly graduated students. Specifically, resources could be developed to improve exam preparation and cultivate positive attitudes toward the exam beginning in the first year of the program. Given the results of this study, mental health care during the exam may also be essential to meet diverse needs of newly graduated students.

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