

The Mediating Effect of Financial Literacy on Entrepreneurship and Nursing Start-Up Attitude

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Abstract Expectations and demands for the paradigm of healthcare systems are changing in response to changes in the characteristics of population properties and industrial structures; therefore, it is time to prepare for the career diversification of nursing students who have mainly entered the clinical field. The study tested the pathway of financial literacy on the relationship between entrepreneurship and nursing start-up attitude among nursing students. We obtained data from 177 South Korean nursing students through email and mobile phone. The analysis of the mediating effect was performed by hierarchical multiple regression. The SPSS WIN program was adopted. Entrepreneurship and financial literacy of subjects had a significantly positive effect on nursing start-up attitudes. Financial literacy indirectly affected the relationship between nursing students' entrepreneurship and nursing start-up attitude, and significance was verified by Process Macro. Financial literacy can mediate between entrepreneurship and nursing start-up attitudes. These factors will provide an important basis for nursing students to grow into talented people with business capabilities. Nursing education should strengthen the foundation that promotes business competence in nursing students.

Keywords Entrepreneurship, Financial literacy, Nursing start-up attitude

I. Introduction

Since 2016, South Korea's youth unemployment rate has been 2.6 times greater than its overall unemployment rate (Statistics Korea, 2022). Younger generations, including nursing students, tend to prioritize ease of employment rather than aptitude or interest in choosing their college. In response to these expectations, most nursing educational institutions have focused on fostering numerous employment opportunities for clinical nursing students (Lim et al., 2020). However, one-way education may hinder nursing students from

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developing innovative and diverse careers. Due to changes in the healthcare environment, such as longer life expectancy, prevalence of chronic diseases, increasing number of home patients, and social dynamics, which involve expanding the female workforce and changing family patterns in the labor market, additional fields must be established in professional nursing (Menegaz et al., 2021).

More than 30% of nurses who have entered clinical practice fail to adapt and resign within a year, and half of the registered nurses have discontinued their nursing careers (Lim et al., 2018). In the field of nursing, start-ups can be a breakthrough in reducing the cost of high turnover in the field and the occurrence of idle labor (Lim et al., 2018). Start-ups initiated by the youth are of high national interest as they create a novel scenario to address employment instability and youth unemployment (Liu et al., 2019). Most characteristics required for start-ups can be acquired through education; therefore, nursing education that can narrow the gap between labor market needs and education is important (Colichi et al., 2019; Kim & Oh, 2022).

Since the 2000s, universities have become increasingly interested in potential entrepreneurs with start-up intentions and attitudes (Liu et al., 2019). The nursing curriculum, in particular, includes subjects that focus on fostering leaders and managers in health organizations. Moreover, some countries have come to value the entrepreneurial nature of nurses by providing legal grounds for nursing clinics and office operations (Colichi et al., 2019). Nursing students who hold a positive attitude toward start-ups tend to move more actively towards creating them (Lim et al., 2020); however, previous studies on start-ups by nursing students in South Korea are limited (Kim & Oh, 2022).

Therefore, the research questions in this study are as follows: First, Does entrepreneurship influence the financial literacy of nursing students? Second, Will the financial literacy of nursing students affect the attitude of nursing start-ups? Finally, does financial literacy have a mediating effect on the relationship between entrepreneurship and nursing start-up attitude?

II. Literature review

Due to the extension of life expectancy and the aging population, the field of nursing start-ups in Korean society is diversifying, and interest in start-ups is also increasing. However, there is little research on nursing start-ups.

Lim et al. (2020) derived variables related to nursing students' start-up intentions through a meta-analysis based on Shirey's (2007) nursing start-up model. A total of 384 of Shirey's variables were identified in Korean studies, among which entrepreneurship was found to be the most important factor influencing start-up intention. Entrepreneurship involves a passion for product

and service development, a willingness to lead the market, and an attitude of taking high risks and exploring various opportunities (Yoon & Kim, 2020). Although several studies have confirmed it as a major factor influencing domestic college students' perception of start-ups (Kang & Park, 2021; Kim & Oh, 2022), entrepreneurship among nursing students was lower than that of other college students; in particular, risk tolerance was the lowest (Kim & Oh, 2022).

Colichi et al. (2019) examined the concept of nursing entrepreneurship, the profile of entrepreneurial nurses, business diversity, business management, start-up barriers in nursing, nursing entrepreneurial support, and entrepreneurship of nursing students. They argued that preparation is necessary because the nursing field ranks lower than other fields in terms of skills and competencies that can be integrated into the changing labor market. However, their arguments may not have sufficiently reflected the time difference between previous studies (Yoon & Kim, 2020).

Educational factors are very important in determining career paths such as start-ups, despite the role of personal characteristics or traits. Start-up education for college students should include the education necessary for establishing start-up infrastructure (Kang & Park, 2021). Shirey (2007) emphasized competencies, such as financial management, related laws and regulations, and planning and operation management, as necessary preparations for starting a business in the nursing field. College students' financial abilities are more effective if they have financial literacy (Kim & Yang, 2016).

Financial literacy refers to the overall level of understanding of finance, such as financial knowledge, behavior, and attitudes necessary for a rational and sound financial life. It is also defined as financial decision-making appropriate to the situation or the daily economic activities needed to improve financial welfare for individuals and society, such as opening bank accounts, saving, or investing (Ko, 2020). Since the 1960s, financial literacy has been treated as a serious topic that includes retirement pensions, savings, and investments to cope with early retirement. Financial literacy has gained increasing attention since the late 1990s, as research has demonstrated a strong correlation between financial literacy and age, educational status, and income levels. Nevertheless, half of the world's adult population is still unfamiliar with the components of financial literacy (Bayram & Palese, 2022). In particular, the area where nurses can legally start a business is expanding, and financial literacy is one of the key competencies required for nursing entrepreneurship (Shirey, 2007).

Financial literacy is important for fostering start-up awareness and promoting start-ups for college students living in a digital society; moreover, it plays a mediating role between entrepreneurship and start-up awareness (Kang & Park, 2021). However, in the detailed sub-domains of entrepreneurship and financial literacy, the results of previous studies remain inconsistent; therefore, another

context may emerge regarding nursing start-ups. This study tried to confirm the importance of entrepreneurship and financial literacy in identifying nursing students' attitudes towards nursing start-ups based on previous studies. Specifically, it determined whether financial literacy can mediate between entrepreneurship and start-up attitude among nursing students who lack systematic financial education.

III. Methodology

1. Study design, setting, and sample

A cross-sectional method was used to survey 177 nursing students. The participants accessed online and submitted consent for participation. A sample size of 190 was determined using G* power version 3.1. The calculation conditions were medium effect size, 0.05 significance level, and 0.95 power (1- β) under the regression analysis with 10 independent variables and a 10% dropout rate.

2. Ethics

The Institutional Review Board of the author's institution (KYU-2022-08-006-001) approved this study. Participants were provided with an explanation of the purpose and procedures of the study, including assurance such as protection of personal identification information and dropout without any disadvantage.

3. Variables

3.1. General characteristics

The demographic information requested of participants were sex, age, school year, academic performance, loan experience (such as student loans), job experience (full-time or part-time), and educational experience (finance and start-up).

3.2. Entrepreneurship

We used the entrepreneurship tool developed by Miller (1983) and modified by Lim (2019) to suit Korean college students. It is an 18-item questionnaire with three subdomains: innovation, risk-taking, and initiative. The questions were rated on a 5-point Likert scale (1= 'strongly disagree'; 5= 'strongly agree'); the level of entrepreneurship is proportional to the score. Cronbach's alpha was 0.92 in Lim's study (2019) and 0.88 in this study.

3.3. Financial literacy

Financial literacy integrates knowledge, actions, and attitudes related to finance. To measure knowledge in the present study, 'Big 3 Questions' was used, which was applied by Watanapongvanich et al. (2022) according to the methodology of Lusardi and Mitchell (2008); this tool is simple and most widely used internationally. For questions about interest calculation, inflation, and stock risks, the proper answer was given as 1 point and the incorrect answer as 0 points; the total score ranges from 0 to 3 points.

Financial behavior and attitudes were measured using a modified tool for college students (Ko, 2020), which rates items on a 5-point Likert scale (1= 'strongly disagree'; 5= 'strongly agree'); it has four questions about financial behavior and three about financial attitude. The level of financial literacy is proportional to the combined score. The Kuder-Richardson Formula-20 of financial knowledge was 0.61, and Cronbach's alpha of financial behavior and financial attitude were 0.67 and 0.71, respectively.

3.4. Nursing start-up attitude

Nursing start-up attitude refers to personal attitude toward nursing start-ups; this includes cognitive and behavioral perspectives, such as information search, start-up preparation activities, and execution (Lim et al., 2020). This study used the instrument developed by Lim et al. (2020). The 12 questions were rated on a 5-point Likert scale (1= 'strongly disagree'; 5= 'strongly agree'); the level of nursing start-up attitude is proportional to the score. The Cronbach's alpha in Lim et al. (2020) and the present study were 0.86 and 0.85, respectively.

4. Data collection

Online surveys (www.surveymonkey.com) were utilized for data collection during the period of October 15 to October 31, 2022. The participants were recruited from an online community of nursing students. Those who agreed to participate received questionnaire links by mobile phone or email. The collected data were coded and downloaded so that personal information could not be identified. The data were analyzed on the author's computer with passwords in compliance with the Institutional Review Board guidelines.

5. Statistical analysis

The SPSS (IBM) version 25.0 was applied for data analysis. Descriptive statistics were utilized to assess the general characteristics of the subjects. The differences in the degree of nursing start-up attitudes according to the general characteristics of the subjects were evaluated using t-tests and one-way ANOVA. Pearson's correlation was adopted to evaluate the correlation between factors.

The hierarchical regression analysis was performed to test the pathway of financial literacy on the relationship between nursing students' entrepreneurship and nursing start-up attitudes. Additionally, a bootstrapping test in Process Macro (no. 4 model; no. of bootstrap samples: 5,000) was conducted to assess the significance of the indirect effect.

IV. Results

Of the 190 submitted questionnaires, 177 were finally analyzed excluding 13 incomplete answers.

Table 1 describes the general characteristics of the subjects and the differences in nursing start-up attitudes according to those characteristics. Most subjects (84.7%) were female; the average age was 21.6 (± 2.2) years. Fewer subjects had experience in lending (16.9%) and taking start-up-related education (28.8%). The group with no loan experience ($p=.022$) and those with experience in start-up-related education ($p=.004$) had significantly higher nursing start-up attitudes.

Table 1. Participants' general characteristics and differences in nursing start-up attitude
(n = 177)

Variables	Categories	n (%) or mean \pm SD	Nursing start-up attitude	t/F	p
Age (in years)	19-31	21.6 \pm 2.2			
Sex	Male	27 (15.3)	4.09 \pm 0.65	-1.25	.215
	Female	150 (84.7)	4.22 \pm 0.44		
Year (school)	1	25 (14.1)	4.21 \pm 0.49	1.48	.222
	2	42 (23.7)	4.11 \pm 0.50		
	3	81 (45.8)	4.27 \pm 0.52		
	4	29 (16.4)	4.11 \pm 0.25		
Academic performance	High	48 (27.1)	4.12 \pm 0.42	2.70	.070
	Middle	100 (56.5)	4.26 \pm 0.46		
	Low	29 (16.4)	4.03 \pm 0.48		
Working experience	Yes	94 (53.1)	4.22 \pm 0.48	0.58	.565
	No	83 (46.9)	4.18 \pm 0.47		
Loan experience	Yes	30 (16.9)	4.02 \pm 0.44	-2.31	.022
	No	147 (83.1)	4.24 \pm 0.48		
Financial education	Yes	39 (22.0)	4.30 \pm 0.51	1.48	.142
	No	138 (78.0)	4.17 \pm 0.47		
Start-up education	Yes	51 (28.8)	4.36 \pm 0.38	2.90	.004
	No	126 (71.2)	4.13 \pm 0.50		

Table 2 presents the average and ranges of each variable. The average scores for entrepreneurship and nursing start-up attitude were 3.39 (out of 5) and 4.19 (out of 5) points, respectively. The average score for financial literacy was 27.69 (out of 38) points, which was the sum of financial knowledge (out of 3 points), financial behavior (out of 20 points), and financial attitude (out of 15 points). The skewness and kurtosis of these variables showed normal distribution, returning ranges of -0.10 to -0.31 and -0.08 to -0.78, respectively.

Table 2. Levels of entrepreneurship, financial literacy and nursing start-up attitude

(n = 177)

Variables	Mean	SD	Range	Skewness	Kurtosis
Entrepreneurship	2.73	0.47	1.6-3.8	-0.14	-0.08
Financial literacy	27.69	5.24	16.0-38.0	-0.10	-0.78
Nursing start-up attitude	4.19	0.48	2.6-5.0	0.31	-0.52

Table 3 shows that both entrepreneurship and financial literacy were positively correlated with nursing start-up attitudes ($r=.25, p=.001, r=.65, p<.001$).

Table 3. Correlations of entrepreneurship, financial literacy and nursing start-up attitude

(n = 177)

Variables	Entrepreneurship	Financial literacy	Nursing start-up attitude
Entrepreneurship	1		
Financial literacy	.26 (.001)	1	
Nursing start-up attitude	.25 (.001)	.65 (<.001)	1

In this study, the multicollinearity between independent variables was verified by tolerance limit and variance inflation factor (VIF). The results show that there is no multicollinearity because the tolerance limit of 0.93 is greater than 0.1, and the VIF is 1.07.

The mediating effect of financial literacy on the relationship between entrepreneurship and nursing start-up attitudes was verified according to the three-step procedure of Baron and Kenny (1986; Figure 1). In addition, the suitability of this regression model was verified by satisfying the conditions of each step as follows. Entrepreneurship, a predictor, positively affected financial literacy in the first step ($\beta=.26, p=.001$) and nursing start-up attitude in the second step ($\beta=.25, p=.001$). In the last step, the regression coefficient of entrepreneurship on nursing start-up attitude decreased from 0.25 (Step 2) to 0.09, and was not statistically significant; only financial literacy was shown to have a significance on nursing start-up attitude ($\beta=.63, p<.001$).

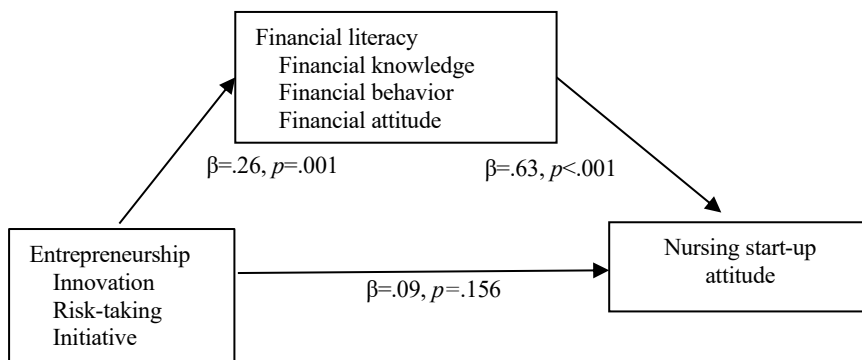


Figure 1. The pathway of financial literacy

In the process of verifying the mediating effect, the indirect effect of financial literacy in the relationship between entrepreneurship and nursing start-up attitude excludes zero in the 95% confidence interval; hence, the validity of the mediating effect was verified. Moreover, zero was included between the 95% confidence intervals in the direct effect (LLCI=-.02, ULCI=.11); the complete mediating effect of financial literacy was confirmed (Table 4).

Table 4. Results of bootstrapping test

(n=177)

Path	Direct effect				Indirect effect			
	Effect	SE	LLCI	ULCI	Effect	Boot SE	Boot LLCI	Boot ULCI
X→Y	.46	.03	-.02	.11				
X→M→Y					-.09	.03	.04	.15

X=Entrepreneurship, M=Financial literacy, Y=Nursing start-up attitude, Boot SE=Bootstrap standard error, LLCI=the lower limit of 95% bootstrap confidence interval, ULCI=the upper limit of 95% bootstrap confidence interval.

V. Discussions

The present study evaluated the relationships between entrepreneurship, financial literacy, and nursing start-up attitude of nursing students. Financial literacy was shown to mediate the relationship between these variables.

Compared with Kim and Oh (2022), which had similar conditions, entrepreneurship and nursing start-up attitudes in this study were slightly lower. This result may be due to the difference in the proportion of students with start-up education experience, which has been reported as a significant factor in nursing start-up attitude and start-up intention. In general, working experiences,

including a part-time job, can be expected to positively affect start-up attitude or intention; however, in reality, the nursing start-up attitude of the group without part-time experience was higher (Kim & Oh, 2022), or there was no difference between groups, as shown in the present study.

A study (Colichi et al., 2019) that comprehensively reviewed the literature related to business, start-up, and entrepreneurship in the nursing field also mentioned the need to provide start-up education at nursing colleges. It has also been emphasized that nursing students at Brazilian public universities who do not have enough opportunities to access start-up-related education need to prepare for such education in the nursing curriculum (Soder et al., 2021). This is consistent with the finding that nursing students with fewer start-up-related educational opportunities have lower entrepreneurship intentions than other college students (Kim & Oh, 2022). If this situation does not improve, the start-up competency of nursing students will decline.

The financial literacy level of students was found to be higher than that of adults (Ko, 2020; Lee, 2018). According to Lee (2018), students' level of financial literacy increased rapidly during college, and there was little difference between students of different sexes. Thus, nursing colleges can be an appropriate venue for providing financial education. An in-depth comparison with previous studies was difficult because few were conducted on nursing students; therefore, caution is advised when interpreting the results because the measurement tools are diverse.

According to the findings of the correlation, entrepreneurship and financial literacy not only showed a positive relationship with nursing start-up attitudes but also between entrepreneurship and financial literacy. These findings are similar to those of studies reporting a positive interaction between entrepreneurship and the start-up intention of nursing students (Kim & Lim, 2019) and between entrepreneurship, financial literacy, and start-up awareness among college students (Kang & Park, 2021). However, they differ from those of studies that did not show a statistically significant interaction between nursing students' entrepreneurship and nursing start-up attitude (Kim & Oh, 2022) and entrepreneurship and start-up intention of college students (Kang & Yang, 2016).

Entrepreneurship continues to draw attention as a personal characteristic that has the most significant impact on college students' start-up intentions (Liu et al., 2019). Financial literacy is also projected to have a crucial influence on starting a business in a rapidly changing work environment (Park & Kang, 2020). Although previous studies yielded inconsistent findings, the facts are worth confirming through repeated studies, including those that involve nursing students in various sociocultural environments.

Our mediating effect analysis showed that financial literacy mediates completely on the relationship between entrepreneurship and nursing start-up attitudes. Our finding on the entrepreneurship of nursing students differs from

that of previous studies, which found that it did not significantly affect nursing start-up attitudes (Kim & Oh, 2022) or intentions (Kim & Lim, 2019). However, our findings corresponded with those of other researchers, indicating that entrepreneurship positively influenced the start-up intention and perception of college students (Kang & Park, 2021; Kang & Yang, 2016), and that financial literacy had a partial mediating effect on entrepreneurship and start-up awareness. Few scholars studied entrepreneurship, nursing start-ups, and financial literacy for nursing students, and the results of some are inconsistent. Hence, our results must be interpreted and generalized carefully.

Interest in entrepreneurship must be urgently encouraged in nursing education. As a business owner who provides services in the therapeutic context of prevention, rehabilitation, education, administration, and direct patient care, a nurse entrepreneur can play a key role in the healthcare market, where the population is aging and the number of long-term care and home-based patients is increasing (Menegaz et al., 2018). Nurses are hesitant to start nursing businesses because of the lack of start-up knowledge and the weak business paradigm. Additionally, the healthcare sector remains financially challenged by various post-pandemic costs, making it necessary to find ways to cope (Bayram & Palese, 2022).

Although financial literacy is important for every individual's well-being, it is especially important for those who aspire to be a nurse entrepreneur or to start a business. However, appropriate financial-related education or training opportunities are required to develop financial literacy and capabilities on a level that will motivate entrepreneurs to establish start-ups (Bai et al., 2017). If provided early in college life and before making various financial decisions, financial education for college students is expected to increase the impact of financial literacy (Lusardi, 2019).

Therefore, nursing start-ups will empower nurses to have a significant impact on the future industrial environment. Moreover, a curriculum to improve nursing students' entrepreneurship, start-up competency, and financial literacy must be developed; it must be provided to nursing students step-by-step and continuously, beginning in their freshman year.

The limitations of this study are as follows. First, the data were obtained using a cross-sectional design and convenience sampling. Therefore, it is advisable to be careful when generalizing the research results because the guarantee of representation for the target population is uncertain. Furthermore, since few studies have examined entrepreneurship, financial literacy, and nursing entrepreneurship attitudes in nursing students, there was a limit to presenting the basis for interpreting our results. Nevertheless, we attempted to raise interest in nurse-led companies or nursing start-ups that are indispensable in the future nursing field. Moreover, this confirmed that financial literacy significantly impacts the association between nursing students' entrepreneurship and nursing

start-up attitudes. We hope that the mechanism between them will become clearer through repeated studies.

VI. Conclusion

Our results indicated that financial literacy serves as a robust mediator in the association between entrepreneurship and nursing start-up attitudes among nursing students. Accordingly, we propose a nursing education curriculum that can help develop a nursing start-up and improve financial literacy competencies for nursing students. This will provide nursing students with an important vision for creating a new paradigm by utilizing nursing knowledge in relation to various fields.

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