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Self-Efficacy in Nursing Students: The Impact of Mastery Experience, Social Influence, and Emotional Factors on Self-Directed Learning in Shanghai, China

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Abstract

Purpose The study aimed to identify the key factors affecting the self-efficacy of nursing students, focusing on the huma n capacity for self-directed learning and behavior. This research examines the influences of mastery experience, vicarious experience, social persuasion, emotional regulation, and anxiety on students' self-efficacy. The objectives include assessing current levels of these variables, designing and implementing a self-development plan to enhance them, and measuring ch anges before and after the plan. **Research design, data, and methodology:** A sequential exploratory mixed-methods desi gn was employed, integrating qualitative and quantitative approaches to create a data collection instrument. The target pop ulation comprised nursing students from vocational colleges in Shanghai, with a sample size of 435 participants. Self-deve lopment plan was conducted among 60 participants. The researcher conducted a paired-sample t-test analysis on all five v ariables to determine if there were any differences in nursing students' self-efficacy between the pre-self-development plan and post-self-development plan phases. **Results:** Multiple regression analysis revealed that mastery experience, vicarious experience, social persuasion, emotional regulation, and anxiety were significant predictors of self-efficacy. **Conclusions:** A theoretical model was developed based on these findings and validated by experts, laying the groundwork for future int erventions aimed at improving nursing students' self-efficacy.

Keywords: Self-Efficacy, Nursing Student, Vocational College

JEL Classification Code: I23, J28, L2

1. Introduct With the rapid globalization of modern society, both the medical and nursing models have evolved, leading to higher expectations for the overall competencies of nurses (Alessandri et al., 2014). In 2005, the State Council emphasized the importance of developing vocational education, focusing on service and employment outcomes. This marked a shift from the traditional, school-centric training models towards enhancing labor quality, particularly vocational skills and competencies (Caprara & Gerbino, 2001). In response, higher vocational nursing education emerged, aiming to cultivate highly skilled and practical professionals. As the importance of higher vocational education has grown, the organization and structure of programs have been continuously optimized. Although the training of nursing professionals in higher vocational colleges has rapidly advanced, it also faces new challenges and opportunities. The objective of nursing education is to develop well-rounded professionals with extensive knowledge and innovative capabilities, who can effectively contribute to the medical and healthcare sectors, master relevant laboratory technologies, and possess comprehensive skills (Fan & Williams, 2010). In the context of higher vocational medical education, emphasis should be placed on vocational skill training that is "ability-based," grounded in both theoretical knowledge and practical examination skills, with a focus on the practical application of these skills to meet the demands of various medical laboratory roles (Al-Abyadh & Abdel Azeem, 2022).

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Currently, students in higher vocational colleges often exhibit poor academic performance and low self-efficacy in their studies. Many believe that even with effort, they will not achieve good grades, leading to psychological resistance to learning. This resistance can negatively impact their academic development and self-efficacy in other areas, hindering their lifelong growth. Therefore, it is crucial for vocational colleges to enhance students' academic self-efficacy, ignite their passion for learning, boost their self-confidence, and support their academic progress.

This research seeks to identify strategies and interventions to boost students' self-efficacy in the context of higher vocational education, particularly within nursing programs, ensuring that graduates are not only well-equipped with the necessary knowledge and skills but also possess the confidence and adaptability required to succeed in the ever-changing healthcare environment.

2. Literature Review

2.1 Self-Efficacy

Self-efficacy is a key element in social cognitive theory, as it "operates in conjunction with other determinants to influence behavior, thought, and action" (Bandura, 1997). Essentially, self-efficacy beliefs affect the interactions between personal factors, knowledge, and behaviors within the context of specific environments. Maddux (2016) defines self-efficacy as the belief in one's ability to organize and execute the necessary actions to achieve specific outcomes. It represents an individual's assessment of their capability to successfully perform a particular task (Schwarzer & Luszczynska, 2008). Importantly, self-efficacy is not a reflection of one's actual skill level, but rather an evaluation of what one believes they can accomplish with their existing skills (Bandura, 1997; Masse et al., 2006). Self-efficacy is context- and task-specific, as individuals assess their self-efficacy in relation to a specific activity or goal.

Self-efficacy beliefs have both direct and indirect effects on how people utilize their knowledge and skills. Individuals are more likely to avoid tasks and situations where they feel incompetent and to engage in tasks they believe will lead to successful outcomes (Bandura, 1997; Pajares, 2002). Consequently, physical educators with higher self-efficacy are more likely to invest effort in including students with disabilities, actively planning for and facilitating their participation (Gecas, 1989).

2.2 Mastery Experience

Bandura (1997) argued that mastery experiences have the most significant impact on self-efficacy beliefs, as they are rooted in an individual's past successes or failures. These mastery experiences, also known as performance accomplishments (Capa-Aydin et al., 2018), involve developing skills through repeated experiences. This process is particularly effective because early successes in performing tasks enhance expectations and familiarity during the initial learning stages (Bartsch et al., 2012). Mastery experiences involve engaging in tasks that model the desired behavior, which helps desensitize individuals to the task, allows them to practice, and gives them opportunities to self-instruct and complete the task (Bandura, 1977). Through repeated successes, mastery experiences diminish the impact of failures. Bandura also emphasized that failure plays a crucial role in the success of performance accomplishments; experiencing failure but continuing to persist and ultimately overcoming the challenge strengthens self-motivated perseverance (Yeh et al., 2019).

An important factor in developing self-efficacy is an individual's preexisting self-knowledge structures. Each person begins their journey of self-efficacy with biases formed from past experiences and how they have previously dealt with and processed failures. Bandura (1997) suggested that the development of efficacy through mastery experiences should build upon existing indicators of self-efficacy. It is essential that these mastery experiences align with the individual's current self-beliefs (Wilson et al., 2020).

H1: Mastery experiences have a significant impact on student's self-efficacy.

2.3 Vicarious Experiences

Vicarious experiences enhance self-efficacy by allowing individuals to observe someone else successfully navigate a situation they would find threatening, without the anxiety of personal involvement (Bandura, 1977). Seeing others perform the same tasks without negative outcomes boosts the observer's determination and resolve (Paternoster & Piquero, 1995). A critical factor in the effectiveness of modeled behavior is the clarity of the consequences. Modeling that lacks clear outcomes or has ambiguous consequences is less effective. On the other hand, when individuals observe someone with similar characteristics overcoming failure and adversity, their confidence in their own ability to persevere increases (Jiang et al., 2014). For vicarious experiences to effectively enhance self-efficacy, it is important that the observer perceives themselves as having similar traits and characteristics as the person being observed (Piquero & Pogarsky, 2002). Vicarious experiences are a crucial component in the development of self-efficacy, reinforcing the successes gained from mastery experiences and serving as an alternative for those whose fears prevent them from engaging in mastery experiences (Achterkamp et al., 2016).

Carter (2005) and Hutchison et al. (2006) emphasized the

necessity of all four sources in building self-efficacy beliefs among college students, particularly highlighting the role of vicarious experiences. Carter (2005) conducted a qualitative study on an introductory college astronomy course where group lab work was introduced, finding that vicarious experiences were crucial because many students lacked previous mastery experiences. Students reported gaining self-efficacy by working with lab partners, as this helped mitigate the absence of prior college lab experience to judge their own performance. Similarly, Hutchison et al. (2006) found that the formation of class teams and the availability of help with assignments were key factors in supporting self-efficacy in their mixed-methods study.

H2: Vicarious experiences have a significant impact on student's self-efficacy.

2.4 Social Persuasion

Limited resources and a lack of competent role models can make verbal persuasion a more prominent option for some individuals (Wood, 2000). Although verbal persuasion is moderately effective and easy to implement in promoting mastery, its impact is generally weaker and more vulnerable to being diminished by negative experiences (Langner et al., 2013). While verbal persuasion is particularly effective when delivered by credible, expert, and appealing communicators, Bandura (1977) noted that it has limitations in fostering long-term self-efficacy (Thieme et al., 2012). Individuals who rely solely on verbal persuasion in the face of distressing threats are more likely to encounter failure (Spotswood & Tapp, 2013).

Many studies have shown that students enjoy learning content, indicating that various sources of self-efficacy, stemming from instructors' teaching methods and their interactions with students, are at play. Novice students, who lack prior experience with a task or concept, feel more confident when trusted individuals help them evaluate their performance and offer encouragement during challenging learning experiences (Bandura, 1997). While social persuasion alone may have a limited effect on self-efficacy beliefs, it can enhance these beliefs when combined with more powerful influences such as mastery or vicarious experiences, especially through positive and constructive feedback (Lam & Chan, 2017). Verbal persuasion is important for both K-12 students (Reese et al., 2009; Usher & Pajares, 2008) and graduate students (Ng & Lucianetti, 2016). Mentors and advisors significantly influence their graduate students' self-efficacy beliefs through verbal persuasion (Zeldin & Pajares, 2000). When students face frustration, mentors can provide the necessary encouragement to help them overcome the pain of failure and muster the courage to persist (Puente-Díaz & Cavazos-Arroyo, 2017).

H3: Social persuasion has a significant impact on student's self-efficacy.

2.5 Regulation of Emotions

Regulation of emotions, also known as emotion regulation, emotion self-regulation, or emotional regulation, refers to the external and internal processes that monitor, evaluate, and modify emotional responses, especially their intensity and duration, to achieve specific goals (Thompson, 1994). In a broad sense, the psychological mechanisms involved in managing emotions are referred to as emotion regulation. It encompasses the capacity to adjust emotional arousal and expressions in response to environmental demands (Mesurado et al., 2018).Top of Form
Bottom of Form

H4: Regulation of emotions have a significant impact on student's self-efficacy.

2.6 Anxiety

Anxiety is an emotion characterized by feelings of fear, worry, and apprehension, leading to anxious thoughts and physical changes (Watson et al., 1995). Although it is a distinct emotion, anxiety is closely linked with depression, making it challenging for researchers to distinguish between the two (Nitschke et al., 2001; Wetzler & Katz, 1989).

Psychologists categorize generalized anxiety into two types: state anxiety and trait anxiety. State anxiety refers to the anxious response triggered by a situation perceived as threatening, such as an exam or quiz. Individuals with high trait anxiety experience stronger state anxiety reactions and more intense responses compared to those with low trait anxiety. They also feel more threatened in evaluative situations, which often leads to higher levels of test anxiety in individuals with high trait anxiety (Lufi & Cohen, 1987).
Top of Form
Bottom of Form

H5: Anxiety has a significant impact on student's self-efficacy.

3. Research Methods and Materials

3.1 Research Framework

The researcher utilized three theoretical models. Soroya et al. (2020), and Kumar et al. (2020). These three frameworks collectively contributed to developing the conceptual framework presented in Figure 1.

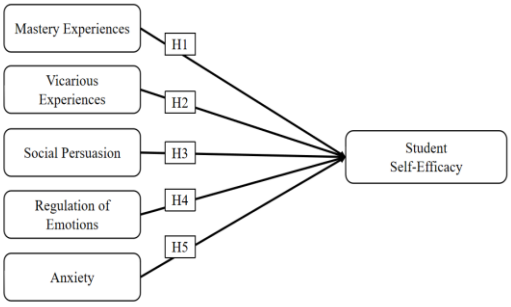

Figure 1: Conceptual Framework

H1: Mastery experiences have a significant impact on Student's Self-Efficacy.
H2: Vicarious experiences have a significant impact on Student's Self-Efficacy.
H3: Social persuasion has a significant impact on Student's Self-Efficacy.
H4: Regulation of emotions has a significant impact on Student's Self-Efficacy.
H5: Anxiety has a significant impact on Student's Self-Efficacy.

3.2 Research Methodology

The research was conducted in a sequential four-stage process. It began with an initial survey of the entire research population of 555 individuals to collect data for testing the proposed conceptual framework. All hypotheses were then rigorously analyzed using multiple linear regression to determine their validity, retaining those that met the significance threshold (p-value < 0.05) and discarding the others. In the second stage, a pre-Intervention Design Implementation (pre-self-development plan) survey was administered to the same 435 students, focusing on the supported hypotheses. The third stage involved introducing the self-development plan to a selected group of 30 participants. Finally, in the last stage, these 30 participants completed post-self-development plan surveys, providing data for a paired-sample t-test analysis. This comparison of results before and after the intervention was used to thoroughly examine the research objectives and test the hypotheses.

3.3 Research Population, Sample Size, and Sampling Procedures

3.3.1 Research Population

The study population consists of nursing students from Shanghai Urban Construction Vocational College, located in Shanghai, China, which offers a three-year post-secondary medical program. The college has a total of 555 nursing students across three grades. The researchers selected students majoring in Nursing (from the three-year higher vocational program) because they represent the primary demographic of medical higher vocational colleges. The breakdown includes 178 freshmen, 206 sophomores, and 171 juniors, totaling 555 students. Based on the Morgan table, the target sample size for this study is 375 students.

3.3.2 Sample size

The researcher began with a pilot survey using a randomly selected sample of 30 students to evaluate the reliability of the measurement instrument. Following this, a research population of 435 valid responses was established. Multiple linear regression analysis was used to investigate the relationships between the independent and dependent variables. In the final stage, 30 voluntary students participated in the self-development plan phase.

3.3.3 Sampling Procedures

The researcher employed a multi-step sampling strategy for the study as follows:

First, in the pilot survey phase, 30 students were randomly selected to participate. These students were asked to complete a survey questionnaire and provide feedback on their experience, which would assist in refining the research process.

In the second phase, aimed at a broader pre-survey, invitations were distributed to 555 students across different grade levels to complete printed versions of the survey questionnaire. After gathering the responses, the researcher reviewed them and confirmed 435 as valid for the study, resulting in a response rate of 79.1%.

Finally, during the self-development planning stage, the researchers used random selection again to invite 60 students to participate in this focused part of the study. These 60 students were randomly assigned to either the control group or the intervention group. The intervention group participated in the self-development plan program, while the control group received no intervention.

The researchers analyzed the numerical differences between the control and intervention groups and compared the results before and after the intervention within the self-development plan intervention group. Both groups completed questionnaires before and after the study.

3.4. Research Instruments

3.4.1 Design of Questionnaire

In this study, the design of the questionnaire was informed by existing literature. The researcher began by creating a set of questions focused on self-efficacy, building on prior work in the field. To ensure that each question was relevant and aligned with the research objectives, the index of item-objective congruence (IOC) was utilized. This index

confirms that each item in the questionnaire is pertinent to the study's goals. The questionnaire was divided into three distinct sections. The first section aimed to collect demographic information, specifically the gender of the respondents. The second section contained questions addressing the various factors being studied, which relate to participants' self-efficacy: mastery experience, vicarious experience, social persuasion, regulation of emotions, and anxiety. The third section focused on self-efficacy itself.

Including respondents' demographic information and learning habits in the questionnaire is important for comparing opinions and intentions. The researcher designed the demographic section using a categorical scale that included gender to better understand respondents' personal characteristics. This simple categorical scale asked respondents to select one of two options for gender: Male or Female. The second section of the questionnaire explored the elements that influence students' self-efficacy, measured by their level of agreement or disagreement on rating scales. This study employed a 5-point Likert scale (Likert, 1932) for evaluating items in the questionnaire, which includes response options such as Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5) (Dawes, 2008; Joshi et al., 2015).

3.4.2 Components of Questionnaire

The questionnaire consists of 34 questions in total. The first section includes 3 questions designed to gather basic information about the research population, such as gender, age, and grade. The second section focuses on self-efficacy and contains 31 questions organized into five dimensions: mastery experience (5 questions), vicarious experience (5 questions), social persuasion (6 questions), emotion regulation (4 questions), and anxiety (6 questions).

3.4.3 IOC Results

To evaluate the alignment between the survey questions and the study's objectives, the researcher enlisted five experts, all professors from China, to use the Index of Item-Objective Congruence (IOC). They assessed each item in the questionnaire, assigning a rating of +1 for strong alignment ("Congruent"), 0 for uncertain alignment ("Questionable"), or -1 for lack of alignment ("Incongruent"). The results were favorable, with all items achieving scores above 0.67, indicating a strong agreement between the survey items and the study's objectives. Given this high level of congruence, the researcher decided to retain all questionnaire items for the subsequent stages of the research.

3.4.4 Pilot survey and Pilot test results

A questionnaire comprising 34 questions was administered to a group of 30 individuals to evaluate its reliability, meaning to determine how consistently it measures what it is intended to measure. Prior to this assessment, the questionnaire underwent an Item-Objective Congruence (IOC) process to validate the content of each item, and all questions were found to be suitable and retained for reliability testing. The results of the reliability test, which assesses how well the questions correlate with each other to form a consistent scale, were presented in a table. The findings were favorable, with each variable in the questionnaire achieving a reliability score exceeding 0.8: .816 for Mastery Experience (5 items), .941 for Vicarious Experience (5 items), .919 for Social Persuasion (6 items), .806 for Regulation of Emotions (4 items), .840 for Anxiety (6 items), and .845 for Self-efficacy (5 items).

Table 1: Pilot Test Result

Variables	No. of items	Sources	Cronbach's Alpha	Strength of association
Mastery Experience (ME)	5	Sands (2021)	0.816	Good
Vicarious Experience (VE)	5	Sands (2021)	0.941	Excellent
Social Persuasion (SP)	6	Sands (2021)	0.919	Excellent
Regulation of Emotions (RE)	4	Soroya et al. (2020)	0.806	Good
Anxiety (AN)	6	Kumar et al. (2020)	0.840	Good
Self-efficacy (SE)	5	Kumar et al. (2020)	0.845	Good

4. Results and Discussion

4.1 Results

4.1.1 Demographic Profile

The researcher presented the demographic profile of the entire research population (n=435) and then specifically for the group of selected students (n=30) who participated in the self-development plan, as detailed in Table 2.

Table 2: Demographic Profile

Entire Research Population (n=435)		Frequency	Percent
Gender	Male	75	17.24
	Female	360	82.76
Age	18-19	186	44.44
	20-21	213	42.76
	22-23	34	48.97
	24 years and above	2	8.28

Entire Research Population (n=435)		Frequency	Percent
Grade	Freshman	162	37.24
	Sophomore	153	35.17
	Junior	120	27.59
Total		435	100
The intervention group (n=30)		**Frequency**	**Percent**
Gender	Male	3	10
	Female	27	90
Age	18-19	20	66.7
	20-21	8	26.7
	22-23	2	6
	24 years and above	0	0
Grade	Freshman	12	40
	Sophomore	15	50
	Junior	3	10
Total		**30**	**100%**

4.1.2 Results of multiple linear regression

The researcher performed a Multiple Linear Regression (MLR) analysis on the responses from 435 survey questionnaires to evaluate the support for each hypothesis. The study focused on five research hypotheses, all pertaining to the dependent variable of nursing students' self-efficacy. To check for multicollinearity, the researcher conducted a variance inflation factor (VIF) analysis. The results showed that multicollinearity was not an issue, as the VIF values were below 5, which is deemed acceptable (Hair et al., 1995). The R-squared (R^2) value in the multiple linear regression model, which included four independent variables, was calculated to be 0.705. This suggests that the model accounts for 70.5% of the variability in students' self-efficacy, highlighting its effectiveness in explaining the variance in nursing students' self-efficacy.

Table 3: The multiple linear regression of five independent variables on student's self-efficacy

Variables	Standardized Coefficients Beta value	t-value	p-value	VIF	R^2
Mastery Experience (ME)	0.159	3.545	0.000**	0.159	0.705
Vicarious Experience (VE)	0.242	4.040	0.000**	0.242	
Social Persuasion (SP)	0.273	4.626	0.000**	0.273	
Regulation of Emotions (RE)	0.204	4.184	0.000**	0.204	
Anxiety (AN)	0.081	2.908	0.004*	0.081	

Note: p-value <0.05*, p-value <0.001**

In summary, the results of the multiple linear regression analysis validated hypotheses H1, H2, H3, H4, and H5. Following these findings, the following hypotheses were proposed for the subsequent Self-development plan:

H6: There is a significant mean difference in Mastery Experiences (ME) between the self-development plan and the post-self-development plan.

H7: There is a significant mean difference in Vicarious Experiences (VE) between the self-development plan and the post-self-development plan.

H8: There is a significant mean difference in Social Persuasion (SP) between the self-development plan and the post-self-development plan.

H9: There is a significant mean difference in Regulation of Emotions (RE) between the self-development plan and the post-self-development plan.

H10: There is a significant mean difference in Anxiety (AN) between the self-development plan and the post-self-development plan.

H11: There is a significant mean difference in Self-Efficacy (SE) between the self-development plan and the post-self-development plan.

4.2 Self-development Plan Intervention Stage

The Self-development Plan Intervention, lasting 14 weeks, aimed to enhance nursing students' self-efficacy. This plan was shaped by a mix of quantitative and qualitative data collected prior to its implementation (pre-self-development plan stage). The researcher outlined the chronological sequence of the intervention activities, as shown in Figure 2 of the study.

Figure 2: Self-development Plan Intervention Stage

4.3 Results Comparison between Pre-IDI and Post-IDI

The researcher conducted a paired-sample t-test analysis on all five variables to determine if there were any differences in nursing students' self-efficacy between the pre-self-development plan and post-self-development plan phases. The tables below illustrate the results of the paired-sample t-test analysis for the five variables:

Table 4: Paired-Sample T-Test Results

Variables	Mean	SD	SE	p-value
Mastery Experience				
The control group	3.691	0.488	0.082	0.033*
The intervention group	3.807	0.574	0.1048	
Vicarious Experience				
The intervention group	3.884	0.5516	0.1038	0.009**
The control group	4.227	0.478	0.0875	
Social Persuasion				
The control group	3.704	0.425	0.0805	0.041*
The intervention group	3.961	0.641	0.1169	
Regulation of Emotions				
The control group	3.8192	0.6764	0.1273	0.008**
The intervention group	4.108	0.615	0.1122	
Anxiety				
The control group	3.6506	0.757	0.1381	0.002**
The intervention group	3.806	0.953	0.1740	
Self-efficacy				
The control group	3.6488	0.6469	0.1167	0.006**
The intervention group	4.000	0.546	0.0998	

Table 4 presents the results of the paired-sample t-test analysis comparing the control group and the intervention group as follows:

There was a significant increase in Mastery Experience, with the control group showing a mean of M=3.691 (SD=0.488, SE=0.082) and the intervention group at M=3.807 (SD=0.574, SE=0.1048), resulting in a mean difference of 0.116 (P<0.05). Thus, H6: There is a significant difference in Mastery Experiences (ME) between the control group and the intervention group.

Similarly, Vicarious Experience showed a significant increase, with the control group at M=3.884 (SD=0.5516, SE=0.1038) and the intervention group at M=4.227 (SD=0.478, SE=0.0875), yielding a mean difference of 0.343 (P<0.05). Therefore, H7: There is a significant difference in Vicarious Experiences (VE) between the control group and the intervention group.

In terms of Social Persuasion, the control group had a mean of M=3.704 (SD=0.425, SE=0.0935), while the intervention group had M=3.961 (SD=0.641, SE=0.1169), leading to a mean difference of 0.257 (P<0.05). Hence, H8: There is a significant difference in Social Persuasion (SP) between the control group and the intervention group.

The Regulation of Emotions also showed a significant increase, with the control group at M=3.8192 (SD=0.425, SE=0.0805) and the intervention group at M=4.108 (SD=0.615, SE=0.1122), resulting in a mean difference of 0.2888 (P<0.05). Thus, H9: There is a significant difference in Regulation of Emotions (RE) between the control group and the intervention group.

Anxiety levels increased significantly as well, with the control group at M=3.6506 (SD=0.757, SE=0.1381) and the intervention group at M=3.806 (SD=0.953, SE=0.174), showing a mean difference of 0.1554 (P<0.05). Therefore, H10: There is a significant difference in Anxiety (AN) between the control group and the intervention group.

Lastly, Self-Efficacy demonstrated a significant increase, with the control group at M=3.6488 (SD=0.6469, SE=0.1167) and the intervention group at M=4.000 (SD=0.546, SE=0.0998), resulting in a mean difference of 0.3512 (P<0.05). Thus, H10: There is a significant difference in Anxiety (AN) between the control group and the intervention group.

Table 5: Paired-Sample T-Test Results (**The control group)**

Variables	Mean	SD	SE	p-value
Mastery Experience				
0-week	3.642	0.7095	0.1214	0.067
14weeks	3.691	0.488	0.082	
Vicarious Experience				
0-week	3.856	0.7279	0.1295	0.079
14weeks	3.884	0.5516	0.1038	
Social Persuasion				
0-week	3.554	0.7222	0.1305	0.0390*
14weeks	3.704	0.425	0.0805	
Regulation of Emotions				
0-week	3.8006	0.7271	0.1317	0.083
14weeks	3.8192	0.6764	0.1273	
Anxiety				
0-week	3.57	0.6919	0.1217	0.059
14weeks	3.6506	0.757	0.1381	
Self-efficacy				
0-week	3.584	0.7155	0.1296	0.064
14weeks	3.6488	0.6469	0.1167	

Table 6 displays the results of the paired-sample t-test analysis comparing the control group at week 0 and week 14 as follows:

For Mastery Experience, the control group at week 0 had a mean of M=3.642 (SD=0.7095, SE=0.1214), while at week 14, the mean was M=3.691 (SD=0.488, SE=0.082). Although there was an increase, the difference between the two time points was not significant, P>0.05.

In terms of Vicarious Experience, the control group at week 0 had a mean of M=3.856 (SD=0.7279, SE=0.1295), and at week 14, the mean was M=3.884 (SD=0.5516, SE=0.1038). Again, while there was an increase, the difference was not statistically significant, P>0.05.

For Social Persuasion, the control group had a mean of M=3.554 (SD=0.7222, SE=0.1305) at week 0 and M=3.704

(SD=0.425, SE=0.0805) at week 14. There was a significant increase, with P<0.05 and a mean difference of 0.15.

Regarding Regulation of Emotions, the control group at week 0 had a mean of M=3.8006 (SD=0.7271, SE=0.1317), while at week 14, it was M=3.8192 (SD=0.425, SE=0.0805). Although there was an increase, the difference was not statistically significant, P>0.05.

For Anxiety, the control group had a mean of M=3.57 (SD=0.6919, SE=0.1217) at week 0 and M=3.6506 (SD=0.757, SE=0.1381) at week 14. The increase was not significant, P>0.05.

5. Conclusions, Recommendations and Limitations

5.1 Conclusions & Discussions

The study explored the impact of five independent variables—mastery experience, vicarious experience, social persuasion, regulation of emotions, and anxiety—on the dependent variable of students' self-efficacy. It employed a thorough research design, data collection, and methodology to derive meaningful insights.

The research design utilized the Index of Item-Objective Congruence (IOC) for validity and Cronbach's Alpha in a pilot test to ensure the reliability of the measurement tools. This meticulous approach enhanced the study's credibility. Data were gathered from 435 valid responses from students at a vocational college in Shanghai and analyzed using multiple linear regression to validate significant relationships between the independent and dependent variables. Additionally, a 14-week Self-Development Plan Implementation was conducted with a group of 60 selected students. Post-self-development plan data were collected and compared with pre-self-development plan data using a paired-sample t-test.

The results indicated that several factors significantly affected nursing students' self-efficacy. Specifically, mastery experience, vicarious experience, social persuasion, regulation of emotions, and anxiety were found to notably influence nursing students' self-efficacy. This implies that focusing on these areas can enhance self-efficacy among nursing students.

The findings from the paired-sample t-test comparison revealed a significant difference in academic achievement between the intervention group and the control group, which did not receive any intervention measures. There was also a significant difference in students' academic performance between the pre- and post-self-development plan stages. However, no significant difference was observed in the control group's academic performance before and after the intervention. This indicates that the implementation of the 14-week self-development plan positively impacted the self-efficacy of nursing students.

This study is important as it identifies strategies to enhance self-efficacy—confidence in one's abilities—among nursing students at a vocational college in Shanghai. By concentrating on mastery experience, vicarious experience, social persuasion, regulation of emotions, and anxiety, the research presents practical steps to improve self-efficacy among students. The study's robust methodology provides comprehensive insights and actionable recommendations, clarifying how to boost self-efficacy in nursing students, which can inform educational strategies aimed at developing essential skills and preparing students to succeed in a competitive and innovative environment.

5.2 Recommendations

Institutions should enhance hands-on learning experiences, including simulations, practical exercises, and clinical rotations. These opportunities should be structured to gradually increase in complexity, allowing students to gain confidence through successful performance.

Facilitate peer learning and mentoring initiatives where students can observe and learn from the experiences of more advanced peers or professionals in the nursing field. Video demonstrations of skills and the sharing of success stories can also enhance vicarious learning.

Implement a supportive communication strategy that emphasizes positive feedback, verbal encouragement, and constructive criticism. Faculty and mentors should receive training to effectively deliver motivational communication that strengthens students' belief in their abilities.

Develop workshops and courses centered on emotional intelligence, stress management, and coping strategies. These programs should equip students with the skills to manage their emotional responses and remain composed in challenging situations, which is vital for nursing practice.

Introduce interventions aimed at reducing anxiety, such as mindfulness, relaxation techniques, and cognitive-behavioral strategies. Creating a learning environment that recognizes and addresses the sources of student anxiety can enhance self-efficacy.

Tailor educational programs to meet the diverse levels of student self-efficacy. Differentiated instruction and additional support can be offered to those who need extra help in building their self-efficacy.

Foster a culture of teamwork and collaboration among students. A collaborative atmosphere can enhance social persuasion and provide more vicarious experiences, ultimately boosting self-efficacy.

5.3 Limitations for Future Research

Despite the thorough research design and methodology used in this study to explore the factors affecting nursing student self-efficacy at a vocational college in Shanghai, China, several limitations should be acknowledged. These limitations present opportunities for future research to expand upon the findings of this study.

The results were obtained from a single vocational college in Shanghai, which may restrict the generalizability of the findings to other settings. Future studies could replicate this research across multiple vocational colleges and locations to improve the external validity of the results.

The study sample comprised 435 students, which may not adequately represent the broader population of nursing students. Furthermore, the self-development plan was applied to a selected group of 60 students. Future research could utilize a larger and randomly selected sample to reduce selection bias and strengthen the reliability of the findings.

While the study mainly employed quantitative methods, integrating qualitative approaches such as in-depth interviews or focus groups could provide deeper insights into how and why specific factors influence self-efficacy from the students' viewpoints.

Anxiety was one of the psychological factors examined in this study. Other emotional and psychological variables, such as stress levels, resilience, and mental health, could also influence self-efficacy and should be explored in further research.

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