ORIGINAL RESEARCH

Analysis of the Correlation between Research Ability, Self-efficacy, and Challenging Blocking Stress in Undergraduate Nursing Students

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ABSTRACT

Objective • Our study aimed to explore the connections between scientific research capabilities, self-efficacy, and challenging and blocking stressors among nursing undergraduates. The goal was to derive insights that could enhance clinical nursing teaching and collegiate nursing education.

Method • We conducted a cross-sectional study with [number of participants using a nursing undergraduate stressor scale, a general self-efficacy scale (GSES), and a research cognition and behavioural scale developed by our team.

Results • The average research ability score among nursing undergraduates was found to be (28.05 ±3.55), with the average self-efficacy score being (26.64 ±3.54). We found a positive correlation between the scientific research ability and self-efficacy of nursing undergraduates, as well as challenging-blocking stress ($P < .05$).

Conclusion • Our findings indicate that self-efficacy and stress from challenges significantly impact the ability of nursing undergraduates to conduct scientific research. Therefore, it is vital to promote self-efficacy and cognitive and behavioural capabilities related to scientific research among these students, while also mitigating stressors. These interventions can help nursing undergraduates to better understand their field and their personal potential. (*Altern Ther Health Med.* [E-pub ahead of print.])

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INTRODUCTION

Scientific research ability refers to an individual's ability to explore new areas in science using appropriate methodologies. It encompasses the depth and breadth of one's professional knowledge, reflecting their ability to identify, acknowledge, and resolve problems. The Council for the Advancement of Nursing Science acknowledges career development in nursing science as a key aspect of its mission.[1] Self-efficacy is the individual's perception and judgment of their ability to perform a specific behavior. The concept of challenging-blocking pressure was introduced by Cavanaugh et al, who categorized it into challenging pressure and blocking pressure based on its nature. Challenging pressure includes work-related factors that contribute to individual career development, such as work responsibility, workload, and time constraints. On the other hand, blocking pressure refers to work-related stressors that negatively impact the individual, such as job insecurity, role ambiguity, and organizational policies. Using the Bronfenbrenner ecological framework, the promotion of research is categorized into microsystems (individual), mesosystems (multiple setting), exosystems (program), and macrosystem (institutional culture) levels. The macrosystem includes a supportive and encouraging environment. By working together, each system contributes to the student's zest for nursing research and interest in graduate studies in nursing to pursue the nurse researcher role.[2]

In recent years, the growing population has led to the rise of various medical institutions. In order to keep up with the development trend of society, the scale of higher nursing education colleges in China is also expanding. This increase in the number of medical institutions has created new development opportunities for the nursing profession.Major medical institutions are in urgent need of a group of high-quality and high-quality nursing personnel. .The undergraduate nursing degree programme is a challenging one and places high demands both professionally and personally on students.[3] Undergraduate junior nursing student teams chose a clinical question, gathered evidence from the literature, synthesized results, demonstrated practice application, and developed practice recommendations.[4]

Faculty are constantly challenged to find interesting classroom activities to teach nursing content and engage students in learning. Nursing students and graduates need to use research skills and evidence-based practice as part of their professional care. Finding creative and engaging ways to teach this material in undergraduate nursing programs is essential.[5] The scientific research abilities of nurses directly impact the advancement of individual departments, entire hospitals, and the nursing discipline as a whole. Finding effective ways to enhance the scientific research skills of nursing staff is a pressing issue.[6] This study examines the correlation between scientific research abilities, self-efficacy, and challenge-blocking stress among nursing undergraduates, aiming to illuminate the interplay among these factors and inform quality nursing education.

METHODS

Participants

For our study, we employed a convenient sampling method to select a total of 234 nursing undergraduates from a university in Taizhou, Zhejiang province. We distributed 234 questionnaires and successfully recovered all of them, resulting in a recovery rate and response rate of 100.0%.

Inclusion criteria: Participants were full-time 4-year nursing undergraduate students.

Exclusion criteria: Non full-time nursing undergraduate students.

Nursing Undergraduate Stressor Scale

This study employs a design based on individual experience, considering factors such as schooling duration, the correspondence between grades and efforts, time spent on interpersonal communication, family obligations, financial constraints, and the accumulation of scientific research knowledge.

The General Self-efficacy Scale (GSES)

We utilized the General Self-Efficacy Scale (GSES), initially compiled by Schwarzer et al.[7] and later translated by Wang Caikang et al.[8] in 2001. This scale contains 10 items and is a unidimensional measure. Its reliability and validity have been confirmed.9 We used the Likert 4-point scoring method, ranging from 1 to 4 points for responses from 'complete disagreement' to 'complete agreement'. Higher scores indicate higher self-efficacy.

Scientific Research Cognition and Behavioral Scale

The scale includes ten items, such as "I can search the literature and data I want,", "I can propose meaningful research questions and hypotheses based on the subject field," and "I want to engage in work related to scientific research."Each item adopts a similar Likert 4-point scoring method, with "completely inconsistent" scoring 1 point, "relatively inconsistent" scoring 2 points, "relatively compliant" scoring 3 points, and "fully conforming" scoring 4 points.

Table 1. General situation comparison of nursing undergraduate students (Points, $\bar{x} \pm s$)

Item	Stress source scale	The Self-efficacy Scale	Scientific Research Cognition and Behavioral Scale	Total Points
College level				
Level 19 (n=90)	22.52±2.52	20.07±3.03	27.33±3.24	76.23±5.69
Level 20 (n=144)	23.49±2.71	27.00±3.78	28.50±3.68	80.79±7.28
F value	7.483	3.906	6.098	25.505
P value	.007	.049	.014	.000

Table 2. analyses the relationship between the scientific research ability of nursing undergraduates and self-efficacy and challenge-blocking stress.

Item	Total scientific research capacity	The sum of the self-efficacy feelings	Challenging-blocking stress sum
Total scientific research capacity	1	0.455	0.146
The sum of the self-efficacy feelings	0.455	1	0.009
Challenging-blocking stress sum	0.146	0.009	1

Research Method

After obtaining consent from the school leaders and research subjects, Investigators visited each classroom, explained the survey's purpose and gave necessary instructions for filling out the questionnaire, which was then distributed and collected on-site. They explained the purpose of the survey and any important instructions before distributing and collecting the questionnaires on the spot. A total of 234 questionnaires were distributed, and all 234 collected questionnaires were deemed valid, resulting in a 100.0% effective recovery rate.

Statistical Analysis

Statistical analysis was conducted using SPSS 19.0 software. The measurement data were characterized by mean and standard deviation ($\bar{x} \pm s$). We employed one-way ANOVA for analysis, with data described by mean and standard deviation ($\bar{x} \pm s$). $P < .05$ was considered statistically significant Pearson correlation analysis was used to examine the relationship between nursing undergraduates' scientific research abilities, self-efficacy, and challenging-blocking stress, with a significance level of $\alpha = .05$

RESULTS

Table 1 summarizes the general run of things of the sophomore and junior nursing undergraduatesincluding stressors, self-efficacy, scientific research cognition, and behavioral scores.

DISCUSSION

Current State of Scientific Research Capabilities among Nursing Undergraduates

According to our survey, the scientific research capabilities of nursing undergraduates are markedly insufficient.Senior nursing undergraduates generally demonstrate stronger scientific research capabilities compared to their junior counterparts. This can be attributed to several factors. Firstly, senior students have a higher level of knowledge than lower grade students and more opportunities to engage in scientific research. Secondly, as senior students are about to enter clinical

practice, the school provides them with more scientific research activities to enhance their research skills. Lastly, senior students have a higher cognitive level and learning consciousness. They possess a belief that they can complete tasks better over time and demonstrate good initiative and consciousness.

Current Status of Self-Efficacy among Nursing Undergraduates

Nursing undergraduates demonstrate moderate self-efficacy, potentially due to the improved employment prospects and advantages associated with their degree This indicates that nursing students understand their abilities well and do not shy away from or slack off in the face of the complexities of professional learning. Most of the time, they can rely on their abilities to overcome difficulties. While self-efficacy is widely studied in education, there is limited research on higher education and even less on self-efficacy in nursing. However, self-efficacy plays a crucial role in students' learning abilities, motivation, problem-solving skills, particularly for nursing undergraduates who form a unique group. Nursing students with a higher level of hardiness would have higher self-efficacy, and more positive and stable academic emotions to obtain the better SRL ability.[11]

Current State of Stress Challenges among Nursing Undergraduates

Nursing students encounter a range of stressors, including personal, academic, and practice-related, which subtly impact their mental health[12] In the learning process, nursing research projects often contribute to the stress experienced by students. The results suggest that nursing undergraduates encounter pressures from various sources, including both challenging and blocking stress. Challenging stress can be beneficial as it helps students develop confidence in their career path and enhances their motivation to perform well. On the other hand, blocking stress has detrimental effects, leading to feelings of insecurity and a loss of direction. Challenging stressors have been positively associated with several work outcomes.[13]

It is emphasized that employees learning and vitality are two equally important components of thriving and that thriving is facilitated by contextual features and available resources. [14]challenge stressors have a positive effect on innovation performance, positive emotional atmosphere mediates the relationship between challenge stressors and innovation performance; hindrance stressors have a negative effect on innovation performance, and negative emotional atmosphere mediates the relationship between hindrance stressors and innovation performance.[15] Some evidence emerged for the moderating role of resilience in the hindrance-strain relationship. The implications of these findings and directions for future research are discussed.[16]Medical school is a challenging environment that requires students to deal effectively with stress borne out of the medical education environment and their personal lives.

The Impact of Self-Efficacy and Challenge-Blocking Stress on the Scientific Research Abilities of Nursing Undergraduates

Scientific research ability is an important indicator for measuring senior professionals. As the nursing discipline develops in China, higher education institutions increasingly focus on cultivating the scientific research abilities of nursing students, with emphasis on curriculum design, goal setting, teaching methodologies, and evaluation methods.[18] The participants of this study, primarily nursing undergraduate students, provide a representative sample. According to the data statistics, nursing undergraduates have low scores in scientific research ability, which may be attributed to all the participants being undergraduates. This suggests that educators in higher institutions should focus on cultivating students' scientific research abilities. This can be achieved by guiding students' thinking, behavior, and learning, enabling them to enhance their scientific research ability through specific training and prepare them for future clinical nursing scientific research work. The concept of self-efficacy was introduced by American psychologist Bandura in his 1977 article titled 'Self-efficacy: A Comprehensive Theory of Behavioral Change'. It refers to an individual's confidence or belief.[19] Self-efficacy plays a crucial role in an individual's ability to achieve behavioral goals in a specific field. Self-efficacy is a subjective assessment of individuals' self-ability and behavior. It is an important component of the self-control system and influences their thoughts and actions. Self-efficacy refers to an individual's belief, judgment, or self-perception of their ability to perform a behavior before actually doing it. It is widely accepted that having a higher sense of self-efficacy positively affects self-improvement. Individual-level variables, including job position, years of experience, employment status, self-efficacy and positive affectivity, were positively related to nursing performance.[20]

Challenging-blocking pressure, as categorized by Cavanaugh and others based on Selye's concept of benign and bad pressure, can be further divided into two categories: challenging pressure and blocking pressure. Challenge pressure primarily pertains to personal career development and the positive emotional experiences derived from work-related stress. Conversely, blocking pressure negatively affects work attitudes and behaviors in relation to stressors.but these two types of stressors will damage the physical and mental health of the individual .[21] Nursing students often face academic and personal stress [22] threatening their health promotion behaviors (HPB) and well-being.

The results revealed a significant prevalence of stress among school students, particularly those in nursing and teaching programs. This finding aligns with the global concern surrounding the psychological well-being of higher education students. It is important to acknowledge that this additional stress faced by nursing and teaching students may have detrimental effects on their physical and mental health. The way these students cope with stress will affect their health and academic performance in.[23] The analysis suggests that students face pressure from various aspects such as learning, social interaction, and family. This highlights the

need for college educators to appropriately adjust the challenging and obstructive pressures when setting student talent training goals. However, the outbreak of COVID-19 has rapidly transformed the landscape of nursing education, imposing multiple pressures on nursing students.[24] Not only did people emphasize the significance of nursing, but they also witnessed several underlying issues in clinical nursing.

Based on the data obtained from the Pearson correlation analysis, there is a positive relationship between scientific research ability and self-efficacy and challenging-blocking stress. The correlation between scientific research ability and self-efficacy is moderate, while the correlation with challenging-blocking stress is very weak. Additionally, there is a very weak correlation between self-efficacy and challenging-blocking stress. A couple of reasons can explain these findings. Firstly, the research subjects were all undergraduates, who may have higher self-efficacy compared to junior college students, which could also impact their scientific research abilities. Secondly, nursing undergraduates, being medical students, experience significant pressure from academic efforts, examination results, family expectations, and scientific research knowledge. These pressures are similar to the ones faced by medical college students investigated by Jiang Haiyan [25] and the pressure of nursing departments and clinical medicine girls investigated by Yang Qin.[26] 3. Nursing undergraduates' lack of scientific research ability may be related to the lack of relevant scientific research activities carried out by the university, the lack of scientific research knowledge reserve of students, and the low enthusiasm for scientific research.

Cultivate the scientific research and innovative thinking of nursing undergraduates.

According to social cognition theory, cognition has an impact on behavior, with thinking being the advanced stage of cognitive activity. Therefore, to enhance the scientific research abilities of nursing undergraduates, a potential approach is to focus on nurturing their innovative thinking in research. The university can offer relevant courses on scientific research thinking to foster the innovative mindset of nursing undergraduates. This will assist them in developing a sense of scientific research innovation and actively identifying problems during the research process, exploring the underlying mysteries, and discovering the enjoyment of scientific research. Both internal and external motivation play crucial roles in the success of every student. Rephrase for clarity and conciseness: "Universities should strive to admit highly qualified individuals, differentiate teaching based on student levels, and foster enthusiasm for scientific research.[27] Research proficiencies for nurses include the ability to search for and evaluate evidence, disseminate findings and apply findings to practice within caring.[28]

Enhance the sense of self-efficacy among nursing undergraduates.

Zhang Wei [29] and others have studied the self-efficacy of Chinese nursing undergraduates to deal with scientific research programs, and they have found that the self-efficacy of nursing undergraduates can cope with their scientific research projects, but the information of the project application process is not perfect, and meeting the needs of nursing undergraduates may need new training programs to support them.

The social cognition theory holds that human behavior will be affected by individual emotions, and that self-efficacy is an emotional expression of self-consciousness, which belongs to the emotional system.[30] Enhancing the self-efficacy of nursing undergraduates can be a starting point for improving their scientific research ability.

At the organizational level, it's crucial to offer students positive guidance and help them set practical academic goals. This can be achieved by encouraging students to explore their strengths, potential, and ultimately, bolster their self-assurance. Moreover, it is advantageous to provide various rewards to recognize students' exemplary performance in their studies. These rewards affirm their accomplishments and create additional avenues for personal growth. By serving as incentives, these rewards stimulate students' enthusiasm for learning and reinforce their belief in their academic abilities. Given the significant levels of stress and anxiety faced by nursing students, it is essential for educational institutions to offer support in promoting a healthy lifestyle. Student life is burdened with three main stressors: mentor-related stress, nurse behavior, and the perception of being untrustworthy. These stressors have adverse impacts on the physical and mental well-being of students, as well as their self-confidence. Thus, it becomes imperative to prioritize the well-being of nursing students, fostering their interest in pursuing a career in healthcare and ensuring their academic achievements.[31]

At the individual level, it is crucial for individuals to effectively address the challenges they encounter in their studies and interpret the potential positive implications of negative events. Believing in their problem-solving abilities and cultivating a positive mindset are key. Individuals can improve their academic performance by enhancing their sense of academic self-efficacy and cultivating self-confidence.[32]

Scientific research and training were conducted according to different individual differences

Nursing students are the main force in the future development of clinical nursing undertakings. Cultivating their scientific research skills and applying innovative methods can enrich students' experience with.[33]

This research project observed a noticeable difference in scientific research ability among nursing undergraduate students. Specifically, senior nursing undergraduates demonstrated a more outstanding scientific research ability. Therefore, it is important to tailor scientific research and training based on individual differences and analyze specific problems. For nursing students demonstrating strong scientific research abilities, advanced training could be

beneficial. Conversely, junior students with weaker research abilities could benefit from foundational training before progressing to advanced levels, based on their progress. Despite the inclusion of nursing research courses in most colleges and universities, there is a lack of emphasis on the practical cultivation of students' scientific research ability. Currently, students only acquire theoretical knowledge of scientific research in school, All English universities now offer an all-degree undergraduate nursing programme. Many currently use an individual supervision model to support final year dissertation students, but with increased numbers and limited resources, new models of supervision are needed.[34]The bachelor thesis is conceived as autonomous, personal and original academic work. But no homogeneity was observed in the key development elements.[35]

The learning environment quality significantly impacts students' emotions, with teacher roles, teaching methods, and academic expectations playing critical roles in influencing students' emotional well-being and academic performance. Additionally, institutional support plays a significant role in this regard. It is essential for schools to train supportive teachers who can effectively fulfill their supporting roles and create a positive learning environment that encourages students to think critically.[36]

CONCLUSIONS

Consider rephrasing this to avoid the term "challenging-blocking pressure" which is unclear. Try, "Self-efficacy and the ability to overcome research-related challenges significantly influence the scientific research abilities of undergraduate nursing students. This sentence is clear but somewhat vague. Consider specifying what kinds of measures might enhance self-efficacy and improve cognitive and behavioral abilities related to scientific research. The term "challenging and demanding learning objectives" may be overly broad. Consider specifying what types of challenges or learning objectives you're referring to. Also, stressors should be defined or exemplified. The term "challenging and demanding learning objectives" may be overly broad. Consider specifying what types of challenges or learning objectives you're referring to. Also, stressors should be defined or exemplified.These strategies may support nursing undergraduates in developing a comprehensive understanding of their field, as well as recognizing their potential and value..Consider clarifying what "this program" refers to, as it is currently vague. Also, add a comma after "such as this program".[37] Consider providing examples or a brief overview of what these predictors are.[38] This sentence is clear but could benefit from additional specificity about the role of nurse scientists.[39] This is a solid point but it could be strengthened by adding examples of how this might be accomplished.[40]

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AUTHOR DISCLOSURE STATEMENT

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