

## Correlation Between Physical Education Performance and Nursing Procedural Skills Among Nursing Students: A Study Based on Current Chinese Policies

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### Abstract

Nursing science is a highly comprehensive discipline, and physical exercise plays an extremely important role in the development of students' physical health and psychological qualities. Simultaneously, clinical operation competency constitutes one of the fundamental skills that nursing students must master. Therefore, this study aims to investigate the impact of physical exercise on nursing students' clinical operation competency through correlation analysis between their physical education performance and clinical operation ability, thereby providing references for nursing education. The research team distributed questionnaires to nursing majors at a university in Beijing, randomly selected 180 valid responses, and utilized SPSS 27.0 software to conduct correlation analysis on the questionnaire data. The results demonstrated that nursing operation ability exhibits a highly positive correlation with physical education grades ( $r=0.865$ ,  $P<0.01$ ). Furthermore, the vast majority of nursing students experience considerable stress during professional studies and daily life (74% of the 180 respondents answered "yes" to this question). For most students, the primary source of stress in nursing education stems from physical discomfort experienced during nursing practice (73%). Professional nursing operations (65%) and theoretical knowledge (62%) also represent significant stress-inducing factors. Additionally, uncertainty regarding future societal integration causes substantial stress among nursing students (59%). Although other factors account for merely 6%, the predominant influences cited by students generally involve familial skepticism toward the profession's future prospects, as well as difficulties in establishing effective communication channels with patients, both of which generate considerable pressure. Consequently, this study reveals a highly positive correlation between nursing students' operation ability and physical education

performance, and we posit that the capacity of physical exercise to effectively alleviate nursing students' academic stress represents a critical mediating factor.

## Full Text

### **Correlation Between Physical Education Performance and Nursing Operation Ability Among Nursing Students: A Study Based on China's Current Policies**

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Nursing is a highly comprehensive discipline, and physical exercise plays an extremely important role in the development of students' physical health and psychological well-being. Meanwhile, clinical operation ability constitutes one of the fundamental skills that nursing students must master. This study aims to explore the impact of physical exercise on nursing students' clinical operation ability through correlation analysis between physical education performance and clinical operation ability, thereby providing references for nursing education. Our research team distributed questionnaires to nursing students at a university in Beijing and randomly selected 180 valid responses for correlation analysis using SPSS 27.0.

## Abstract

Nursing is a comprehensive discipline, and physical exercise plays an extremely important role in the development of students' physical health and psychological quality. Clinical operation ability is one of the basic skills that nursing students must master. Therefore, this paper aims to explore the impact of physical exercise on nursing students' clinical operation ability through correlation analysis between physical education performance and clinical operation ability, in order to provide reference for nursing teaching. The research team distributed questionnaires to nursing students at a university in Beijing, randomly selected 180 valid questionnaires, and used SPSS 27.0 software to conduct correlation analysis on the results. The results showed that nursing operation ability and sports performance are highly positively correlated ( $r = 0.865$ ,  $P < 0.01$ ). The vast majority of nursing students feel considerable pressure during professional learning and daily life (74% of the 180 respondents answered "yes" to this question). Most students reported that their greatest pressure during nursing studies stems from physical discomfort experienced during nursing practice (73%). Professional nursing operations (65%) and theoretical coursework (62%) are also important factors causing student stress. Additionally, uncertainty about future societal integration creates considerable pressure for nursing students (59%). Although other factors account for only 6%, the main reasons given by students generally include negative family perspectives on the profession's future devel-

opment and difficulties in establishing effective communication pathways with patients, both of which create certain pressures. Therefore, this study demonstrates a high positive correlation between nursing students' operation ability and physical education performance, and we believe that sports constitute a key factor in effectively reducing nursing students' stress during professional learning.

**Keywords:** Integration of Physical and Educational Activities, Nursing Education, Psychological Support, Physical Health Management

## 1. Research Purpose and Background

In September 2020, China's State General Administration of Sport and Ministry of Education jointly issued the "Opinions on Deepening the Integration of Sports and Education to Promote the Healthy Development of Young People." This "integration of sports and education" targets not only athletes but all young people, aiming to integrate resources from both sports and education systems to jointly cultivate socialist builders and successors with comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor skills [1].

In existing research on the correlation between nursing students' physical education performance and clinical operation ability, most studies have focused on secondary vocational and vocational high school nursing students. Sports-related research has only focused on the types of sports participated in and attributed findings solely from a kinematics perspective, while neglecting the psychological problems faced by nursing students in their learning and daily lives.

We believe that the correlation between nursing students' physical education performance and their nursing clinical operation ability deserves attention. Through this article, we can gain deeper understanding of the relationship between nursing students' physical education performance and nursing operation ability, as well as the role and effectiveness of the sports-education integration policy in promoting comprehensive development among nursing students. This study is expected to make important contributions to the comprehensive development and professional ethics enhancement of nursing students, and to provide more scientific basis for applying the sports-education integration policy to nursing student education.

## 2. Methods

### 2.1 Study Subjects

Our research team distributed questionnaires to nursing students at a university in Beijing and randomly selected 180 valid questionnaires to explore the impact of physical education performance on students' nursing operation ability based on the survey data.

## 2.2 Inclusion and Exclusion Criteria

### Inclusion Criteria:

- (1) Nursing major students
- (2) Authentic and valid questionnaire responses
- (3) Relevant clinical internship experience

### Exclusion Criteria:

- (1) Unable to participate in or did not participate in physical education courses due to physical or other reasons
- (2) Did not learn nursing-related operations or participate in nursing operation assessments

## 2.3 Research Methods

Nursing operation ability scores were derived from the average of relevant operation scores and clinical performance scores from students' three-semester "Fundamentals of Nursing" courses. Physical education scores were taken from the average of recorded scores from the first and second academic years. SPSS 27.0 statistical software was used to perform K-S tests on the data to verify whether both datasets followed a normal distribution. Subsequently, statistical processing and correlation analysis were performed on the data. Simultaneously, we surveyed whether students experienced stress during nursing professional learning and identified stress sources, calculating percentage values for each item to facilitate further discussion and analysis from this perspective.

## 3. Results

### 3.1 Correlation Analysis Between Nursing Operation Ability and Physical Education Performance

Nursing operation ability and physical education performance showed a high positive correlation ( $r = 0.865$ ,  $P < 0.01$ ). The degree of correlation is shown in Table 1 .

#### Table 1 Correlation Between Nursing Operation Ability and Physical Education Performance

Nursing operation ability  $<0.001$

### 3.2 Statistics on Perceived Stress in Nursing Students

The results revealed that the vast majority of nursing students feel considerable pressure during professional learning and daily life (74% of the 180 respondents answered "yes" to this question). Specific statistical results are shown in Table 2 .

#### Table 2 Survey on Whether Nursing Students Feel Significant Pressure During Professional Learning and Daily Life (N=180)

Whether nursing students feel significant pressure during professional learning and daily life

### 3.3 Survey of Stress Sources Among Nursing Students

Since most nursing students experience considerable pressure in both learning and life, we further investigated the sources of stress, hoping to categorize the types of stress sources to better attribute our findings. The survey results showed that most students' greatest pressure during nursing studies stems from physical discomfort experienced during nursing practice (73%). Professional nursing operations (65%) and theoretical coursework (62%) are also important factors causing student stress. Additionally, uncertainty about future societal integration creates considerable pressure for nursing students (59%). Although other factors account for only 6%, the main reasons given by students generally include negative family perspectives on the profession's future development and difficulties in establishing effective communication pathways with patients, both of which create certain pressures. Specific statistical results are shown in Table 3 .

**Table 3 Survey of Stress Sources Among Nursing Students (N=180)**  
Stress source type: Physical discomfort during clinical nursing; Difficult nursing operations; Difficult nursing theory courses; Uncertainty about the future

## 4. Discussion and Attribution

Our experimental results revealed that students' physical education performance is highly positively correlated with their nursing operation ability. We can therefore conclude that students' physical education performance is significantly correlated with their nursing operation ability. We believe this positive correlation arises because sports can alleviate students' stress during nursing professional learning and daily life, which is reflected in the relevant performance data.

### 4.1 Physical Discomfort During Clinical Nursing

Due to the specialized nature of nursing, students often experience prolonged sitting because of heavy theoretical coursework pressure, and inevitably face prolonged standing during clinical practice training. Extended periods of standing and sitting can cause lumbar intervertebral disc degenerative diseases [2] or a series of chronic diseases [3]. Physical exercise plays an important role in maintaining energy balance by reducing adipose tissue and improving lipid and carbohydrate metabolism, thereby reducing various risk factors for chronic disease occurrence [4].

### 4.2 Difficulty of Nursing Operations and Theoretical Courses

Physical exercise combines mental and physical effort, requiring precise coordination of movements across body parts. Because nursing professional courses

are numerous and complex, students often find it difficult to quickly master theoretical knowledge. For certain specialized courses such as “Nursing Psychology” and “Cognition and Perception,” students may match their own psychological conditions with certain psychological knowledge, thereby creating biases in their self-understanding. However, long-term physical training not only increases flexibility in all joints and promotes muscle tissue development but also enables students to fully mobilize bodily functions during sports to improve physical flexibility and coordination. According to Pavlov’s theory of higher nervous activity, after motor conditioned reflexes are established, they form dynamic stereotypes. Once established, as long as signals for that stereotype appear, the movement sequence can be completed more easily and naturally. The more such dynamic stereotypes are established, the easier it is to form new motor skills. Therefore, when students possess certain motor skills, their ability to learn basic nursing skills and their receptivity are significantly enhanced [5]. When people are in motion, the brain produces endorphins that have pain-relieving and euphoric effects, thereby alleviating and reducing depression, anxiety, and other negative emotions and ensuring mental health at the source [6]. Moreover, physical exercise can promote brain development, change the material basis of memory, and improve brain work efficiency. Regular physical activity can promote intellectual development, enhance memory, and delay brain aging [7]. Through participation in sports, students can better improve their physical fitness, strength, and coordination, enabling them to master new nursing operation techniques more quickly. Additionally, regular physical exercise can improve memory and accelerate mastery of new knowledge, which benefits professional course learning.

### **4.3 Uncertainty About Nursing Career Prospects and Other Factors**

In today’s society, increasing medical disputes and similar phenomena also increase students’ psychological pressure, leading to a rising probability of nursing students experiencing anxiety about future career choices [8]. Moreover, as senior students face greater employment pressure after graduation, the likelihood of anxiety caused by future career choices and uncertainties increases [9]. Negative family perspectives on the profession and communication difficulties encountered during clinical internships also create considerable pressure for students. During certain collective sports training processes, students can effectively improve their interpersonal communication skills and learn how to communicate more effectively through interactions with team members.

## **5. Conclusion and Outlook**

### **5.1 Experimental Conclusion**

This study demonstrates that nursing students’ nursing operation ability is highly positively correlated with their physical education performance. We believe that sports constitute a key factor in effectively reducing nursing students’ stress during professional learning.

## 5.2 Future Outlook

The General Office of the State Council issued the “Outline for Building a Leading Sports Nation,” which states that youth sports service systems need to be improved and proposes “promoting physical literacy and healthy lifestyles among young people as important content of school physical education.” Additionally, the “Healthy China 2030” Planning Outline proposes requirements for improving physical fitness for all and strengthening the integration of sports and medicine. Physical education must face society, emphasizing that the entire society should take action to conscientiously implement various measures to strengthen youth sports and enhance youth physical fitness, improve school sports facilities, strengthen sports safety management, and guide young people in scientific exercise. This experiment provides more scientific evidence for the sports-education integration policy through detailed data research. Our findings suggest that nursing education should emphasize physical education teaching while focusing on nursing operation skills training. Moreover, nursing students’ physical training content could focus more on strengthening physical fitness and coordination training, with appropriate increases in collective sports training sessions to alleviate stress faced by students in learning and daily life.

## 5.3 Research Limitations

Due to insufficient sample size, this study could not further quantify the types of student stress sources, and therefore could not use other statistical methods to further explore which aspects of stress relief through sports are most effective. Additionally, students’ subjective influences when filling out questionnaires may have affected the accuracy of results. Our research team will continue to follow up and propose more suitable solutions in the future.

## References

- [1] Sun Ke, Liu Tiejun, Ma Yanhong, et al. Reflections on the Integrated Development of Sports and Education with Chinese Characteristics—Interpretation of the “Opinions on Deepening the Integration of Sports and Education to Promote the Healthy Development of Young People” [J]. *Journal of Chengdu Sport University*, 2021, 47(01): 13-20. DOI:10.15942/j.jcsu.2021.01.003.
- [2] Zeng Qi. Quantitative Evaluation of the Effect of Long-term Static Overload on Lumbar Intervertebral Disc Degeneration Using T1 and T2 Mapping [D]. Guizhou Medical University, 2021. DOI:10.27045/d.cnki.ggyyc.2021.000095.
- [3] Guo Xuecan. Study on the Association Between Sedentary Behavior and Multiple Chronic Metabolic Diseases [D]. Jilin University, 2022. DOI:10.27162/d.cnki.gjlin.2022.001313.
- [4] Zhang Suzhen, Chen Wenhe, Zhao Gang. Effects of Aerobic Exercise on Physical Fitness of Middle-aged and Elderly Women [J]. *Journal of Shanghai University of Sport*, 2004(01): 63-67. DOI:10.16099/j.cnki.jsus.2004.01.015.

- [5] Liu Songping, Deng Ruijiao, Yu Jian. Analysis of the Correlation Coefficient Between Physical Education Performance and Nursing Skills Operation Performance of Nursing Majors [J]. Journal of Social Science of Hunan Medical University, 2001(03): 95-96.
- [6] Dai Bin, Zhou Wei, Zhuang Xuan. Research Progress on Exercise Promoting Mental Health from a Methodological Perspective—Review of “Sports and Mental Health” [J]. Science and Technology Management Research, 2023, 43(08): 259.
- [7] Wei Guosheng, Xu Rulin, Liang Li. Sports Contribute to Intellectual Development and Memory Improvement [J]. Sports Science Research, 1996(04): 24-28.
- [8] Liu Qiongyao, Wang Yan, Zhou Xiaohua, et al. Investigation and Analysis of the Psychological Impact of Frequent Medical Disputes on Medical Students—Taking Three Medical Colleges in Changsha as Examples [J]. Chinese Medical Ethics, 2016, 29(01): 151-153.
- [9] Zhang Li’na, Ma Xiaoling, Gao Yunshan. Discussion on the Impact of Violent Incidents Against Medical Staff on Medical Students’ Professional Learning and Career Choice Views [J]. School Party Building and Ideological Education, 2017(05): 68-71.

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