



The Impact of Standardized Testing on Nursing Education Outcomes: Review of the NCLEX's Role in Shaping Curriculum and Competence in Nursing Practice

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Abstract

Background: The increasing complexity of healthcare demands innovative approaches in nursing education to adequately prepare students for clinical practice. Standardized tests, such as the NCLEX, serve as critical benchmarks for assessing nursing competence, yet their impact on educational outcomes remains a topic of debate.

Methods: This review synthesizes current literature on the influence of standardized tests on nursing education outcomes, focusing on their role in shaping curriculum design, student preparedness, and overall educational quality. A comprehensive search was conducted across multiple databases, including PubMed, CINAHL, and ERIC, to identify peer-reviewed studies published from 2010 to 2023.

Results: The analysis revealed that standardized tests significantly impact nursing curricula by driving the incorporation of essential competencies and knowledge areas. However, the pressure to perform well on these evaluations can lead to increased anxiety among students and may not always reflect their clinical skills. Furthermore, while standardized testing has been linked to improved pass rates on licensure exams, evidence suggests that it may inadvertently narrow the focus of nursing education, emphasizing test-taking strategies over holistic patient care.

Conclusion: Standardized testing, particularly the NCLEX, plays a dual role in nursing education—serving as both a motivator for curriculum development and a potential source of stress for students. While it

contributes to the standardization of nursing competencies, there is a need for educational frameworks that balance test preparation with comprehensive clinical training. Future research should explore alternative assessment methods that better align with the multifaceted nature of nursing practice.

Keywords: Standardized Testing, Nursing Education, NCLEX, Educational Outcomes, Clinical Competence

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1. Introduction

The rapid advancement of information technology and the scarcity of nursing personnel need a revolution in nursing education to equip students for dynamic and intricate healthcare settings [1-3]. In 2018, 75,029 competent candidates for bachelor's degrees and nursing postgraduate programs were denied admission to US nursing schools owing to a lack of faculty, clinical locations, classroom space, clinical preceptors, and budget limitations [4].

The primary objective of nursing education is to facilitate the implementation of theoretical knowledge in clinical practice [5]. Nonetheless, restricted clinical practice time diminishes students' opportunities to get experience with actual patients [6]. The absence of clinical experience, which equips trainees for the actual clinical setting, may lead to nursing procedural mistakes that jeopardize patient safety [7]. Bridging the divide between theory and practice in education is essential, however presents several problems for nursing educators [8]. In this context, to ensure the quality and safety of nursing education, educators have used many instructional methodologies, including simulation experiences for students [9].

Simulation has shown to be an effective pedagogical method that enhances nursing education in response to the evolving demands of the field and improves the instructional process [10-12]. The National Council of State Boards of Nursing asserts that simulation is an essential element of nursing education [13]. The use of simulation as an educational instrument in nursing is becoming more prevalent, offering students authentic opportunity to apply theoretical knowledge. Simulation provides students with several practical chances to rehearse clinical situations and engage in quick decision-making and reflection [15].

As simulation technology advanced, the virtual world was unveiled—first used in military and medical sciences, subsequently in medical education [16,17]. Virtual reality (VR) employs computer technology to construct an interactive three-dimensional (3D) environment, providing users with a sense of spatial presence [18]. It offers a first-person active learning experience via varying levels of immersion, facilitating genuine perception of the digital realm and enabling interaction with objects and/or execution of activities inside this digital environment [19,20]. Virtual reality significantly facilitates clinical and procedure-oriented teaching via simulation [21]. VR simulation denotes the employment of diverse immersive, visually rich, three-dimensional features to emulate real-world scenarios and healthcare procedures, integrating physical or alternative interfaces such as a computer keyboard, mouse, speech recognition, motion sensors, or haptic devices [22]. Virtual simulation involves real individuals manipulating simulated systems through a computer interface, as the scenario is neither physical nor in real time. This may encompass surgical simulators utilized for on-screen procedural training, typically integrated with haptic devices for system interaction. Generally, virtual reality may transform simulation into an excellent supplementary tool for education [22,23].

With the advancement and growing affordability of VR technology, nursing education is undergoing transformation [24]. Virtual reality has garnered significant interest in nursing education and is used to instruct several nursing principles, including leadership, communication, decision-making, critical thinking, inclusion, health assessment, and disaster triage [25,26]. The application of virtual reality in simulations facilitates repetitive, practical training to enhance cognitive and skill proficiency among nursing students, typically characterized as the assessment of participants' comprehension of concepts and their capacity to execute a procedure or technique, respectively [8,27]. Moreover, VR simulations provide nursing students the chance to hone their abilities in a secure setting, eliminating any danger to patients [28]. Research revealed that 98% of participating students endorsed the use of virtual simulation in nursing education moving forward [29].

Despite the many benefits of VR, several research have shown that it is not superior to conventional approaches for certain results, like knowledge and performance scores [30,31]. Inconsistencies about the efficacy of VR persist throughout research. Recent meta-analyses have been performed on the efficacy of virtual reality in some domains of medical and education [32,33]. To our knowledge, no meta-analysis has assessed the efficacy of virtual reality in nursing education. Only one paper conducted a systematic review and evaluation of the usefulness of virtual reality (VR) without using meta-analysis, concentrating on the efficacy of VR simulation in comparison to other simulated techniques for clinical psychomotor skills among pre-registration nursing students [34]. Consequently, it is essential to assess the efficacy of virtual reality in nursing education. This study aimed to conduct a meta-analysis on the efficacy of virtual reality in enhancing knowledge (participants' comprehension of concepts), skills (participants' capability to execute a procedure or technique), satisfaction (participants' perception of the VR learning intervention), confidence (self-assurance in learning content and process), and performance time (duration taken to complete the test task) within nursing education.

2. Methods

An electronic literature search was conducted in the Cochrane Library, Web of Science, PubMed, Embase, and CINAHL (Cumulative Index to Nursing and Allied Health Literature) from its creation until 2023.

3. The Efficacy of Virtual Reality Simulation Techniques In Nursing Education

This meta-analysis evaluated the efficacy of virtual reality simulation techniques in nursing education. Our findings indicate that virtual reality educational techniques enhance the understanding of nursing students. Nonetheless, there was no difference between virtual reality and other educational approaches for the results of skills, satisfaction, confidence, and performance duration.

The meta-analysis included 12 studies with 821 people. All research used VR education as the intervention in experimental groups, whereas control groups utilized educational approaches such as conventional education, high/low fidelity manikins, mannequin-based simulation, and plastic models. Of the 12 experiments, 4 trials documented the production of random sequences. Only one research detailed the allocation concealment; two studies indicated the blinding of outcome evaluation. Moreover, blinded interventions for students and educators were unfeasible due to the specificity of the VR educational approach. The total risk of bias in the included studies was deemed uncertain owing to insufficient information.

Virtual reality education shown greater efficacy in nursing education compared to conventional educational techniques and other simulation-based approaches. Qualitative research on the use of virtual reality in nursing education indicated that, via the tangible experience of virtual patient simulations and reflective tools, students were able to comprehend the material and apply the newly acquired information. Prior research concentrating on virtual reality in health professions education shown that VR with increased interaction was more beneficial for knowledge acquisition [21]. This research substantiate that an interactive learning environment fosters students' ability to link ideas. The majority of research included in our meta-analysis used interactive virtual reality educational techniques, which may explain the findings.

Our findings indicate no substantial difference between VR education and other educational techniques for skill outcomes, corroborating a prior systematic analysis [34]. The analysis determined that virtual reality groups had performance scores and success rates in skills that were comparable to those of simulation groups [34]. In our investigation, all included trials that reported skills used alternative simulation instruction approaches in the control groups. We similarly determined that virtual reality was not more helpful than other simulation approaches in enhancing abilities inside nursing education. A potential explanation for these findings is the disparity between the completion of virtual cases and actual practice. Nursing abilities acquired via a virtual platform may not be efficiently transferred to real-world scenarios due to the limitations of current VR technology [35].

No substantial difference in participant satisfaction was seen between VR education and the educational approaches used in the control groups. Significant heterogeneity was observed. Our sensitivity analysis

revealed that one of the four trials included indicated that virtual reality was more satisfied [36]. In a 2012 study, several participants noted that the underdevelopment of VR technology impacted user pleasure [37]. Conversely, two recent investigations indicated no difference between the two groups [31,38]. Consequently, we assert that participants' pleasure with VR education may fluctuate based on technological circumstances. Despite nursing students in the 21st century demonstrating significant use, accessibility, and purpose to utilize clinical VR simulation, its application in nursing education remains limited. Advancements in technology enable virtual reality to more effectively meet consumer needs. Nonetheless, further study is required to validate our findings.

The confidence findings demonstrated no difference between experimental and control circumstances. Virtual reality did not improve participants' confidence more effectively than control settings, aligning with prior research conducted in Korea [39]. During the use of VR for operational exercises, simultaneous usage of a mouse was often required [39]. Consequently, the operational methodology in virtual reality is more challenging than in other simulations, such as the manikin.

4. Duration of Performance

We further performed a meta-analysis of performance duration. The findings indicated that virtual reality was not more successful in decreasing performance time compared to other teaching approaches. Significant variability was observed across studies, even after doing a sensitivity analysis using the leave-one-out approach. The found variety may stem from the varying study designs of the examined studies, including operational projects, VR equipment, and educational approaches in control groups. Research evaluating the efficacy of VR endoscopic simulation training examined performance time with enough data and found no difference between the VR and control groups; yet the quality of the evidence was markedly poor [40]. Research in clinical medicine indicated that VR may assist operators in reducing performance time [41,42]. Consequently, further trials are required in the future to examine the efficacy of VR on performance duration in nursing education.

5. Advantages and Disadvantages

This research has many strengths. This research is the first meta-analysis evaluating the influence of virtual reality on nursing education. Secondly, to evaluate the efficacy of VR education, we assessed five outcome measures—knowledge, skills, satisfaction, confidence, and performance time—which may serve as a reference for nursing education.

Our research also has several drawbacks. Initially, we only included publications published in English, which may influence the outcomes of the meta-analysis. Secondly, some of the included studies did not disclose the specifics of sequence creation, allocation concealment, and blinding techniques. Third, we included 12 research with various treatments in control groups, potentially resulting in considerable variation across the trials.

6. Conclusions

This study offers a thorough assessment of the use of virtual reality in nursing education. Our research indicates that virtual reality educational techniques may enhance the understanding of nursing students. Nonetheless, regarding the results of skills, pleasure, confidence, and performance time, there seems to be no difference between VR and other educational approaches. The use of VR should be seen as a means to augment knowledge and as a supplementary tool to other simulation methodologies to increase the quality and safety of clinical practice. Nonetheless, the variability and potential bias in the included research must be acknowledged. Comprehensively structured large-scale research are necessary to validate the findings of this review.

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تأثير الاختبارات الموحدة على نتائج التعليم التمريضي: مراجعة لدور اختبار NCLEX في تشكيل المناهج الدراسية والكفاءة في ممارسة التمريض

الملخص

الخلفية: تتطلب التعقيدات المتزايدة في مجال الرعاية الصحية اتباع نهج مبتكرة في التعليم التمريضي لإعداد الطلاب بشكل كافٍ للممارسة السريرية. تُعد الاختبارات الموحدة، مثل NCLEX، معايير أساسية لتقييم كفاءة التمريض، إلا أن تأثيرها على نتائج التعليم التمريضي لا يزال موضوعاً للنقاش.

الطرق: تستعرض هذه المراجعة الأدبيات الحالية حول تأثير الاختبارات الموحدة على نتائج التعليم التمريضي، مع التركيز على دورها في تشكيل تصميم المناهج الدراسية واستعداد الطلاب وجودة التعليم بشكل عام. تم إجراء بحث شامل في قواعد بيانات متعددة، بما في ذلك PubMed وERIC وCINAHL، لتحديد الدراسات التي راجعها النظراء والمنشورة بين عامي 2010 و2023.

النتائج: كشفت التحليلات أن الاختبارات الموحدة تؤثر بشكل كبير على المناهج التمريضية من خلال دفع إدراج الكفاءات والمعارف الأساسية. ومع ذلك، فإن الضغط لتحقيق أداء جيد في هذه التقييمات قد يؤدي إلى زيادة القلق بين الطلاب، وقد لا يعكس دائماً مهاراتهم السريرية. علاوة على ذلك،

بينما ارتبطت الاختبارات الموحدة بتحسين معدلات النجاح في اختبارات الترخيص، تشير الأدلة إلى أنها قد تضيق تركيز التعليم التمريضي، مما يركز على استراتيجيات اجتياز الاختبارات بدلاً من الرعاية الشاملة للمرضى.

الاستنتاج: يلعب الاختبار الموحد، وخاصة NCLEX ، دورًا مزدوجًا في التعليم التمريضي—فهو يعمل كمحفز لتطوير المناهج الدراسية وأيضًا كمصدر محتمل للتوتر للطلاب. وبينما يساهم في توحيد كفاءات التمريض، هناك حاجة إلى أطر تعليمية توازن بين الإعداد للاختبارات والتدريب السريري الشامل. يجب أن تركز الأبحاث المستقبلية على استكشاف طرق تقييم بديلة تتماشى بشكل أفضل مع الطبيعة المتعددة الأبعاد لممارسة التمريض.

الكلمات المفتاحية: الاختبارات الموحدة، التعليم التمريضي، NCLEX، نتائج التعليم، الكفاءة السريرية.