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Literature Review

Implementation of Virtual Reality Simulation in Psychiatric Nursing Education: A Literature Review

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A R T I C L E I N F O

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A B S T R A C T

Schizophrenia is one of the mental health diagnoses commonly addressed in psychiatric nursing education. This field of study provides essential knowledge about mental disorders and equips students with skills to manage various challenging behaviors. The anxiety experienced by psychiatric nursing students is common but often subsides after initial patient interactions. This literature review aims to explore the effectiveness of virtual reality (VR)-based simulations in enhancing nursing students' competencies in caring for individuals with mental health disorders. The review includes journal articles published between 2015 and 2024, sourced from Wiley Online, ScienceDirect, and Google Scholar. Article selection followed the PRISMA protocol, including identification, screening, and eligibility phases, resulting in 10 articles for analysis. VR simulations offer immersive, realistic environments that allow students to safely practice therapeutic communication, perform mental health assessments, and strengthen critical thinking. Research findings demonstrate that VR simulations significantly improve students' knowledge, skills, and empathy in psychiatric nursing. Despite their advantages, VR-based learning also presents challenges, such as technical issues and resource limitations. Nevertheless, the evidence supports VR as a promising educational tool for enhancing psychiatric nursing competencies and promoting equitable, high-quality mental health care among future nurses.

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INTRODUCTION

One of the key medical diagnoses addressed in psychiatric nursing education is schizophrenia. Schizophrenia was considered dangerous and uncontrollable, which also caused wild behaviors (Videback, 2020). According to Mansouri & Darvishpour (2024), the progression from fear of schizophrenia to disinterest in psychiatric nursing and heightened anxiety about interacting with patients with mental illness presents a significant concern in nursing education. This apprehension can diminish their interest in pursuing psychiatric nursing careers and heighten anxiety when interacting with patients experiencing mental health disorders. Given the

complexity of this disease and the concerns of student nurses, adequate training and clinical exposure are essential. A lack of preparation may compromise the quality of care and negatively impact both patients and nursing students (Lee, Y., et al., 2020). To address these issues, it is essential to provide comprehensive education that demystifies mental illnesses and offers positive clinical experiences.

Psychiatric nursing education includes theoretical knowledge of mental disorders and skills training to manage a range of challenging behaviors (Halter, 2014). Anxiety among psychiatric nursing students is common, but it typically subsides after initial contact with patients (Videbeck, 2020). Therefore, educators must ensure that students' first experiences in clinical practice are positive. Simulation-based education can serve as a safe and effective tool in this regard, offering students the opportunity to apply theoretical knowledge before engaging in real clinical settings. This can also improve students' skills in caring for patients with mental disorders. In accordance with the National League for Nursing Board of Governors (2015), simulation provides a learning opportunity for students to integrate theory with practice while making real-time clinical decisions in an environment that does not pose a risk to patients.

One of the techniques of simulation is Virtual Reality (VR). In health professions education, VR is defined as a technology that enables users to explore and interact with computer-generated environments, offering immersive experiences that enhance learning outcomes (Kyaw et al., 2019). Virtual Reality (VR) technology has the potential to transform the field of education by offering students a more immersive and engaging learning experience (Al-Ansi et al., 2023). Nursing students report several positive aspects of VR and recommend the use of this technology in various health care settings and contexts (Saab et al., 2022). VR can be used for simulation-based education, allowing students to practice clinical skills in a controlled environment. Since the 1960s, VR has encompassed a variety of technologies, including the Sensorama Simulator (Heilig 1962), online virtual worlds (e.g. Second Life), massively multiplayer online role-playing games (MMORPGs, such as World of Warcraft), surgery simulators, rooms where all walls are covered in displays (Cave Automatic Virtual Environments, CAVE), as well as a wealth of different Head-Mounted Displays (HMDs) (Jensen & Konradsen, 2018).

VR simulation is increasingly recognized as an effective alternative to traditional nursing simulations (Lee, Y., et al., 2020). It allows nursing students to engage with interactive scenarios in which they can apply theoretical knowledge while interacting with virtual patients. These experiences not only improve clinical skills but also help reduce the stigma often associated with mental illness among nursing students. As Brown (2015) notes, VR case scenarios are student-driven, enabling learners to make clinical decisions within a simulated environment. The affective components included in the design of this virtual patient simulation help improve the simulation experience and real students' engagement. his educational approach supports the development of critical thinking, decision-making, communication, and empathy. Therefore, this literature review aims to explore the effectiveness of VR-based simulations in enhancing the skills of nursing students in caring for patients with mental health disorders.

METHOD

This study employed a literature review approach guided by the PICO framework (Population or Patient, Intervention, Comparison, Outcome). For Population: students, Intervention: virtual reality, Comparison: no comparison, and Outcome: improved communication skills, increased empathy and enhanced knowledge of mental health disorder. Literature sources were obtained from three main databases: Wiley Online, ScienceDirect, and Google Scholar. The search was conducted using the following keywords: (("simulation", "virtual reality" OR "virtual world") AND ("psychiatric nursing education")).

Table 1. Framework Research Question PICO

P	I	C	O
Psychiatric nursing students	Virtual Reality	No comparison	Improved communication skills, Increased Empathy, and Enhanced knowledge of Mental Health disorders

This literature review specifically focuses on the use of virtual reality simulation in psychiatric nursing education. The literature search was carried out between November 2024 and December 2024. A total of ten articles were selected for analysis based on predefined inclusion and exclusion criteria. The selection of literature sources is determined based on inclusion and exclusion criteria. Inclusion criteria are literature published in the last ten years that discusses virtual reality simulation in education, especially psychiatric nursing education, using quantitative and qualitative research designs, full text in Indonesian and English. Exclusion criteria are focused on medical students rather than nursing students, do not include full text, and have inappropriate titles. To manage references and avoid duplication, all selected articles were imported into Mendeley Desktop, where duplicates were automatically identified and removed

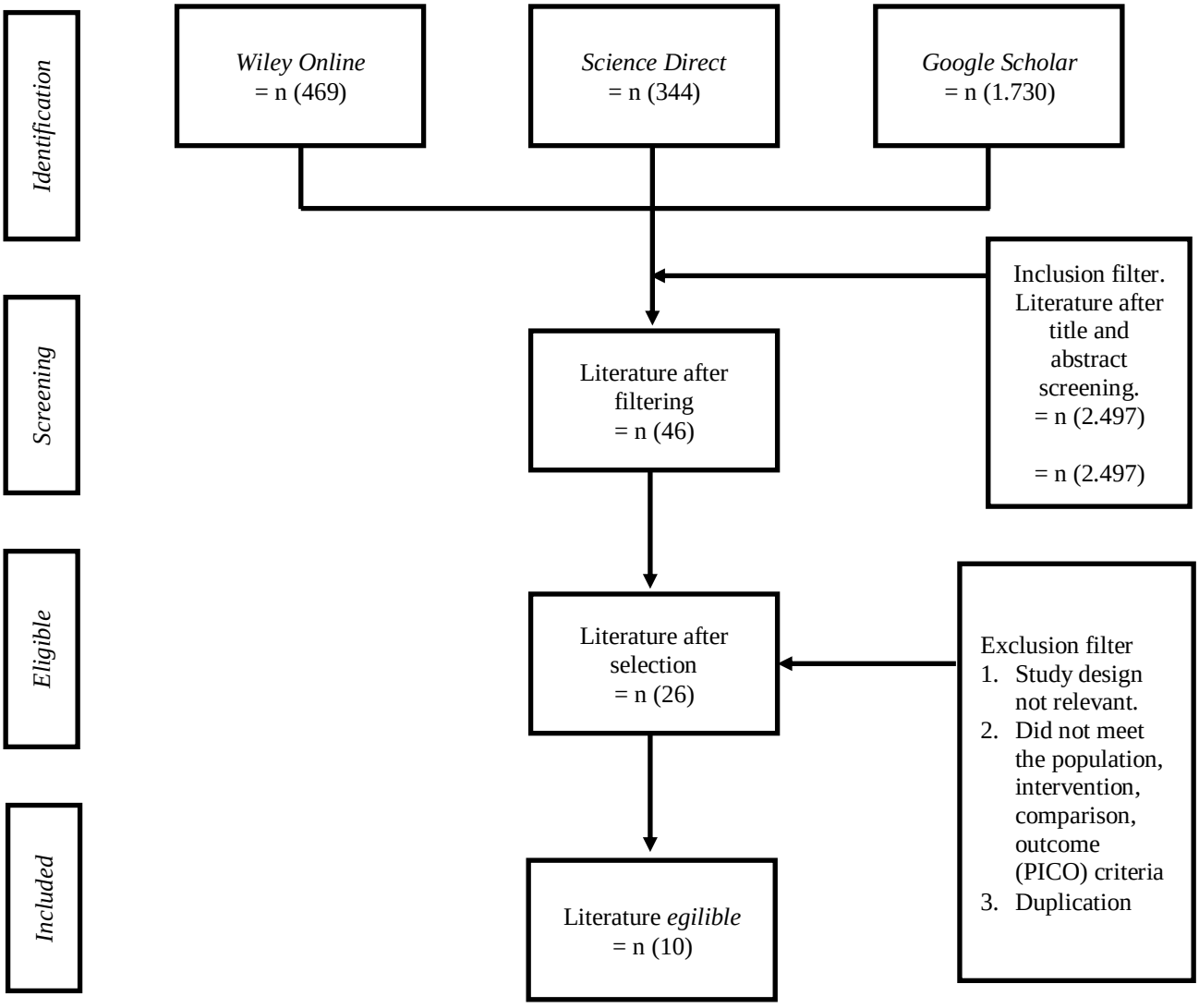

Fig 1. PRISMA Flow Diagram

RESULT

Table 2. Results of literature characteristics

No	Title	Participants (n)	Author, Year & Country	Competency	Research Design	Results
1	Usability of mental illness simulation involving scenarios with patients with schizophrenia via immersive virtual reality: A mixed methods study	Nursing students (n=60)	Lee et al., 2020 & Korea	Therapeutic Relationship and Skills	A mixed-methods study	A useful learning strategy that can be an effective alternative to previously used nursing simulations. Students find this form of education interesting and useful.
2	Virtual patient simulation in psychiatric care A pilot study of digital support for collaborate learning	Volunteering students (n=24)	Sunnqvist et al., 2016 & Sweden	Nursing skills and Therapeutic relationship	Quasi-experimental	Help students overcome their fears and gain important components for building a therapeutic relationship.
3	Supporting student mental health nurses in clinical placement through virtual in-practice support (VIPS): Innovation uptake and the 'VIPS' project	Involved two academic institutions working with the same mental health care service. Student nurses in their final year. (n=NA)	Hardy et al., 2016 & United Kingdome	Maximise student learning	An evaluation of the use of video conferencing sessions created for students to conduct online (i.e., virtual) group tutorials is presented.	Some students reported experiencing issues with sound quality and, in particular, audio feedback that interfered with their participation in discussions.
4	Nursing students' views of using virtual reality in healthcare: A qualitative study	Nursing students (n= 26)	Saab et al., 2022 & Ireland	Positive Experience	Qualitative Study	Nursing students reported several positive aspects and recommended the use of this technology in a variety of healthcare settings and contexts.
5	Nursing students' perceptions of interaction in a multiplayer virtual reality simulation: A qualitative descriptive study	Nursing students (n = 24)	Piispanen et al., 2024 & Finland	Essential skills in nursing practice.	Qualitative Study	Provides nursing students with the opportunity to practice nurse-to-nurse interactions and interactions related to nurse collaboration, which are essential skills in nursing practice. Several students stated that the simulation would have been difficult to complete successfully without the opportunity to seek guidance from the simulation facilitator during the simulation session.
6	Expanding virtual reality simulation with reflective learning to improve mental health nursing skills of undergraduate nursing students	Nursing students (n=59)	Sun Kyung Kim, Mihyun Lee, Youngho Lee, Younghye Go & Mi Hyeon Park., 2024	Communication competency	Mix Method Design	After the simulation, communication competency scores increased in both groups. Overall scores for deep learning and satisfaction were higher in the intervention group compared to the control group.

7	Positioning virtual reality as means of clinical experience in mental health nursing education: A quasi-experimental study	Nursing students (n=68)	Lee, M., et al., 2024	Comprehensive understanding	Quasi-experimental, pre- and post-test	The findings of this study demonstrate the potential to optimize mental health nursing simulation.
8	The Effects of Virtual Simulation on Undergraduate Nursing Students' Beliefs about Prognosis and Outcomes for People with Mental Disorders	Nursing students (n=299)	Liu, W., 2021 & United States (Amerika Serikat)	Nursing students' optimistic beliefs	Prospective cohort design	Nursing students gained better insight into the prognosis of people with depression after receiving virtual simulation.
9	Assessing the Effectiveness of a Virtual Reality- Based Simulation Program for Mental Health Nursing Practicum	Nursing students (n=54)	Kim et al., 2023 & Korea	Educational and Therapeutic Nursing	Quasi-experimental research	Effective in providing knowledge about mental disorders and improving learning flow and learning satisfaction.
10	Virtual reality simulation for nursing education: effectiveness and feasibility	Nursing students (n=675)	Kiegaldie & Shaw, 2023 & Australia	Educational and Therapeutic Nursing	A mixed-methods quasi-experimental design study	Students highly appreciated the interprofessional team's communication and collaboration skills, as well as the opportunity to practice essential tasks such as documenting handovers and conducting patient assessments

Analysis of the impact of using virtual reality (VR) in psychiatric nursing education was obtained through a review process of ten selected journal articles. From this process, two major themes emerged, namely the **positive impact** and the **negative impact** of the VR application. These themes were identified by analyzing the key concepts discussed in each article. Recurring patterns across the literature allowed these concepts to be classified into distinct thematic categories.

Positive Impact

The use of simulation in nursing education provides an approach to nursing science that is taught and learned. Simulations facilitate the conceptual understanding of nursing principles for both educators and students. They also serve as preparatory tools, helping students gain confidence before entering clinical practice, especially to increase knowledge and experience in providing nursing care for mental disorders. The integration of simulation into psychiatric nursing education is considered an innovative strategy for teaching the complex skills required to provide holistic care for individuals with mental illness. The application of simulation techniques to psychiatric nursing education can also help identify bias, stigma, anxiety, and fear, and areas that require further skill development among students (Brown, 2015).

Negative Impacts

One of the negative impacts is that students find it difficult to complete the simulation without guidance from the facilitator. Piispanen et al. (2024) noted that several students expressed difficulty in navigating the simulation sessions successfully without the ability to seek support during the experience. To mitigate these challenges, it is crucial to implement structured guidelines for VR usage within psychiatric nursing curricula. Providing regular breaks and limiting the duration of VR sessions can help reduce the physical discomfort that may arise from extended use. Moreover, integrating debriefing sessions post-VR simulations allows students to reflect on their experiences, addressing any psychological distress and reinforcing the application of empathetic communication in real-world scenarios. By adopting these strategies, educational institutions can enhance the effectiveness of VR as a teaching tool while safeguarding the well-being and professional development of psychiatric nursing students.

DISCUSSION

Positive Impact: Improve Skills

VR-based simulations have been shown to increase students' knowledge, which serves as a foundational step in preparing for clinical interactions with patients. As Formosa et al. (2018) explained that VR simulations effectively provide content-based understanding for students. Similarly, Neale (2019) noted that simulation training fosters realistic learning environments and is particularly beneficial for teaching communication, which is an essential skill in psychiatric nursing. Research has shown that various skills and attitudes can be taught or targeted through simulation. Brown (2015) found that some nursing students who had participated in these simulation exercises provided positive feedback, recognizing its effectiveness in improving their ability to assess mental disorders and communicate with patients. Students also expressed increased self-awareness and attention characteristics, which are key elements in delivering quality psychiatric nursing care. VR simulation helps improve content-based knowledge and communication skills needed in psychiatric nursing. This approach creates a realistic, effective learning environment to develop the ability to assess mental disorders, increase self-awareness, attention, and support the practice of psychiatric nursing care.

Moreover, VR simulation is considered an ethical and safe strategy in mental health education. Kim et al. (2023) emphasized that VR-based programs are effective in delivering knowledge about mental health disorders and enhancing learning flow and satisfaction. Students can also interact with VPs, which can improve students' nurse-patient interaction skills (Piispanen et al., 2024). Saab et al. (2022) also found that students perceive VR positively and recommend its use across healthcare education settings. Thus, VR-based simulations in mental health nursing education are considered safe, ethical, and effective in improving knowledge about mental disorders, learning flow, and learning satisfaction. Students can interact with VPs to hone their nurse-patient interaction skills and recommend the use of this technology in various health care settings.

Compared to traditional simulation-based education (SBE), VR offers a more immersive and scalable experience. These simulations are highly scalable, accommodating a larger number of students simultaneously and supporting further research. Additionally, VR technology allows remote access, offering greater flexibility for students who may have limited access to physical simulation labs. This remote accessibility saves time and eliminates travel requirements, unlike SBE, which typically necessitates in-person attendance at a designated location (Kiegaldie & Shaw, 2023). While both VR and traditional simulation-based education (SBE) provide valuable hands-on learning experiences, VR offers greater flexibility by allowing students to access realistic training scenarios remotely, whereas SBE typically requires physical presence in a designated lab. While SBE remains valuable for hands-on training, VR's accessibility and scalability offer a flexible alternative that enhances student engagement and learning efficiency.

Positive Impact: Enhanced Knowledge and Increased Empathy

VR simulation has proven to be an effective tool in helping students master mental health nursing material. Students can learn communication with patients, empathy, assess signs and symptoms, and also establish nursing diagnoses. Lee et al. (2024) found that students trained with VR had the ability in symptom management, violence risk management and nurse-patient interactions. Nursing students also gained better insight into the prognosis of depression sufferers and had improved communication skills after receiving

virtual simulation. Interactions related to nurse collaboration are important skills in nursing practice (Wei Liu, 2021; Kim et al., 2024; Piispanen et al., 2024). This particular finding suggests that the acquisition of empathy for individuals diagnosed with schizophrenia or other psychotic disorders. Formosa et al. (2018) emphasized its role as a valuable training tool for mental health professionals, while Saab et al. (2022) recommended its use specifically for enhancing empathy in nursing education.

Sunnqvist et al. (2016) noted that simulations involving virtual patients or simulated voices effectively reduce students' fear and improve their therapeutic communication techniques. In line with this, Brown (2015) found that VR helps identify stigma, anxiety, and skill gaps among students. By creating a psychologically safe and realistic space, VR enables students to practice without the pressure of real-life consequences, enhancing confidence, empathy, and clinical reasoning in mental health scenarios.

Based on the literature reviewed, the implementation of VR in mental health nursing faculties in Indonesia is recommended. VR has been shown to improve student competencies and reduce anxiety surrounding psychiatric care. The Second Life virtual simulation platform, for instance, offers a safe, accessible, and engaging environment for learning. Lee et al., (2020) reported that participants found VR simulations easy to use, interesting, and fun. When students enjoy learning and experience reduced stigma and anxiety, better clinical outcomes can be expected. Other findings suggest that this method has significant implications for educators working in mental health who want to teach core competencies in a safe, practical, and cost-effective way, as well as for students who want to work with individuals with mental health disorders (Formosa et al., 2018).

Negative Impact and Solutions

Despite its benefits, the implementation of VR in nursing education presents certain limitations. Some students reported frustration, often stemming from unfamiliarity with the technology. Hardy et al., (2016) added some issues experienced by the students such as poor sound quality and disruptive audio feedback that become barriers to effective participation. Additionally, students expressed difficulty completing simulations without real-time guidance from facilitators (Piispanen et al., 2024). In other words, the implementation of VR in education also presents certain drawbacks that must be taken into account. These include student frustration caused by limited technological proficiency, issues with sound quality, and audio interference that disrupts discussions. Additionally, some students reported difficulty completing the simulations without support from a facilitator during the session.

Despite advancements in Virtual Reality (VR) technology, its application in psychiatric nursing education still presents critical research gaps. For instance, while VR has demonstrated potential in simulating complex mental health scenarios, there is limited exploration of its long-term impact on students' clinical reasoning and empathy skills. Furthermore, inconsistencies in findings regarding its effectiveness in improving emotional preparedness and real-world application skills complicate its integration into standardized curricula. These challenges necessitate a detailed review to evaluate existing evidence and identify areas requiring further investigation. One potential solution is the adoption of a hybrid learning model that combines VR simulations with traditional hands-on clinical training. By combining VR with real-world clinical experiences, students can develop critical skills without over-reliance on immersive technology. Additionally, implementing adaptive VR environments that allow students to control their exposure levels based on individual comfort and learning progress can help reduce physical and psychological strain. Finally, providing mental health support, such as counseling services and peer discussion groups, can help students process their VR experiences and prevent potential emotional distress.

Scenario Application

In this simulation, students are presented with video-based scenarios to be analyzed and acted out through roleplay. The three short example movies include (1) an angry man at the office, (2) a self-presentation to a small group in a work setting, and (3) mindfulness on the beach with biofeedback. Students can move their heads to naturally direct their gaze, with the virtual environment adjusting accordingly based on real-time orientation data. Real-life executions such as speaking and expressing emotions to the avatar are encouraged as responses during conversation skills training and throughout emotional expression exercises. Certain sections of the simulation also offer multiple-choice response options, allowing participants to browse a list of possible answers and make selections using an input button (Ose et al., 2019; Park et al., 2011).

Fig 2. A screenshot of our 360-degree video while filming a scenario of schizophrenia patients' symptoms (Lee, Y., et al., 2020).

Highlight Research Gaps

In Indonesia, the integration of VR into psychiatric nursing education remains in its early stages, with several key research gaps requiring attention. One important area for future research is the feasibility and effectiveness of VR-based training in Indonesian nursing institutions, particularly considering the disparities in technological infrastructure across regions. Although VR has shown promise in enhancing nursing education globally, further research is needed to evaluate its accessibility, relevance, and outcomes within

Indonesia's unique healthcare and educational contexts. Additionally, cultural and social factors that influence the acceptance and application of VR-based training must be examined to ensure simulations are aligned with local practices and student needs.

Another crucial research gap is the development of localized VR simulation content tailored to Indonesia's healthcare environment. Future studies should focus on designing VR scenarios that reflect the country's mental health challenges, including community-based psychiatric care and region-specific patient cases. Moreover, research should assess the cost-effectiveness and sustainability of VR implementation in Indonesian nursing schools, considering financial constraints and the need for faculty training. By addressing these gaps, researchers and educators can optimize VR's role in psychiatric nursing education and contribute to improving mental health care across Indonesia.

CONCLUSION

The application of virtual reality simulation is an important method in psychiatric nursing education. The use of simulation in mental health nursing education is also an innovative way to teach nursing students. The use of this method can improve knowledge, communication skills, nursing care skills in critical thinking, therapeutic relationships between students as nurses and patients, and reduce stigma and fear of students in dealing with patients with mental disorders. In addition, this method is very safe, practical, and ethical to apply to mental health nursing education is also an interesting and fun method that can be applied.

Based on the findings of this literature review, the use of VR simulations is highly recommended for integration into psychiatric nursing education in Indonesia. However, challenges remain, particularly related to technological barriers and limited familiarity with VR tools. These issues can be addressed through the development of simulation training programs and the preparation of trained facilitators. With adequate resources and support, VR-based education can be effectively implemented, minimizing potential drawbacks while maximizing its educational impact. This review serves as a foundation for future development and adaptation of VR in Indonesian nursing curricula, contributing to more effective and empathetic mental health care education.

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