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Clinical Simulation for Psychiatric Nursing Students: A Systematic Review

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ABSTRACT

Clinical simulation is increasingly used in the education and training of healthcare professionals. Such professionals include physicians, nurses, respiratory therapists, and paramedics. Nurse educators must employ evidence-based practices to ensure high-quality clinical training for nursing students. The purpose of the current review attempted to compile the available research evidence on using and effectiveness of simulation for nursing students. The relevant literature was extracted by searching electronic databases (MEDLINE, PsycINFO, and CINAHL) and hand-checking reference lists of past similar reviews. The search strategy revealed 1544 records. After removing duplicates and screening the titles and content of the abstract, the total number of articles was 19. This article advocates using simulation as a teaching strategy in undergraduate psychiatric nursing education. The review discussed the benefits and ways of enhancing simulation use in the psychiatric nursing specialty.

1. Introduction

Clinical simulation is increasingly used in the education and training of healthcare professionals. Nurse educators need to employ evidence-based practices to provide nursing students with high-quality clinical training [1]. The pandemic of COVID-19 has forced many educational institutions to use more innovative and applicable approaches to teach and train students in a risk-free environment [2]. Therefore, simulated labs have been proposed for health specialties, especially nursing and medicine, to compensate for the loss of opportunities that enable them to learn skills and manage patients' needs [3]. The traditional models that

depend primarily on learning by doing affect patients' safety, which may influence a nursing student's ability to develop the necessary skills and competencies in actual clinical areas [4], [5]. As one proposed approach, high-fidelity simulation has significantly contributed to clinical nursing training [6]. Simulation is defined by the Society for Simulation in Healthcare as "a technique that utilizes a condition or setting to permit persons to experience a representation of a real occasion for practice, learning, evaluation, testing, or to obtain an understanding of systems or human actions" [7].

Background

The military has been the most constant simulation customer [8]. There is verification of simulation being used to train soldiers in battle strategies dating back to 1000 B.C. From the mentally challenging board games that were utilized to illustrate army movements to a physically demanding barrel with wooden sticks protruding that a swordsman could exercise his skills upon [9], simulation has been used in an assortment of historical training applications. For this purpose, mannequins were developed to teach obstetrical and basic clinical skills, such as nasogastric tubes and urinary catheters [10]. However, nursing students still use low-tech forms of simulation to learn other clinical skills [11].

The technological revolution in the 20th century brought forth advancements in simulation. For example, in the late 1960s, a simulator was designed for training anesthesia students. This simulator, known as *Sim One*, was programmed to have a heartbeat, measure blood pressure, and have spontaneous breathing [12]. Researchers discovered that residents trained using the simulator performed better than residents who learned solely in the field [9]. Since 1980, various national educational institutions have developed and utilized simulation in education and training and conducted academic research for medical, nursing, respiratory therapy, and pharmacy students [13]. For example, Winter Institute for Simulation Education and Research (WISER) features sixteen full-size patient simulators (14 adults and two children) that can be programmed to exhibit natural features. The mannequins can have a palpable pulse, a chest that rises and falls with the breath, and even a voice. The mannequins can be intubated and have intravenous lines inserted. Today, human patient simulators are used extensively in training various healthcare professionals, including nurses. However, nursing students and psychiatric nursing need to become more familiar with clinical simulation at the undergraduate level. Due to risks and issues related to psychiatric care and management, many nursing education institutions sought alternatives for direct students' training in psychiatric units; simulation was one proposed solution. This has been offered an effective model of teaching and learning during the COVID-19 pandemic, where nursing students in psychiatric courses are forced to online education. There were promising results for eLearning and online education in general [14-15]. Nevertheless, simulation is still one approach that needs to be more emphasized in nursing education, especially for psychiatric courses.

Clinical simulation might teach physical and psychological assessment, clinical procedures, team-based learning, and technology. Though contemporary simulation has been used in the medical fields of anesthesiology, critical care, and medical-surgical skills, the area of psychiatric nursing is in the early stages of routinely using simulation. Due to the COVID-19 pandemic, intensive online nursing education has focused on physical skills and competencies such as vital signs. However, nursing students have been deprived of appropriate training at inpatient and outpatient psychiatric units. Therefore, simulation is an opportunity that should be considered to train nursing students equally in all subspecialties.

2. Purpose of the Review

A systematic review has been conducted to understand the effectiveness of simulation on students' clinical skills in the field of psychiatric nursing. This would illustrate simulation's benefits and potential

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employment in psychiatric nursing curricula. Therefore, the purpose of the current study was to compile the available research evidence on using and effectiveness of simulation for nursing students. This systematic review was intended to answer the following research questions:

1. What are the benefits of using simulation in undergraduate psychiatric nursing education?
2. What are the possible applications of simulation in undergraduate psychiatric nursing education?

The present review was written following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) 2020 statement [16].

Objectives

1. Systematically identify, analyze, describe, and collate studies that employed clinical simulation in undergraduate psychiatric nursing education.
3. Evaluate the nature and strength of evidence for using clinical simulation in undergraduate psychiatric nursing education.

3. Methods

3.1 Eligibility Criteria

The inclusion criteria for considering relevant materials in this review were: 1) published in English language only, 2) articles employed clinical simulation, and 3) targeted undergraduate nursing students only as participants. On the other hand, incomplete reports, editorial papers, conference proceedings, opinion papers, abstracts, posters, unpublished materials, and grey literature were excluded from this review.

3.2 Information Sources

The relevant literature was extracted by searching electronic databases. The following electronic databases were exhaustively searched to extract the relevant literature: PsycINFO, CINAHL, and MEDLINE. These databases were the most frequently searched in appropriate studies. No time limit was set to retrieve the maximum number of relevant materials.

3.3 Search Strategy

A search strategy was used to include all relevant studies focused on nursing students in the mental health and psychiatric care field. The keywords used in this study were: simulation, nursing simulation, psychiatric nursing, psychiatric care, high fidelity simulation, and clinical nursing training. Then, the Boolean operators (AND, OR) were then used between these keywords to retrieve relevant materials.

3.4 Study Selection

Two researchers (M.A., L.H.) independently screened titles and abstracts of the records for eligibility. In case of disagreement over eligibility, a third researcher (A., H-M) is consulted to make the final decision of including or excluding a particular record.

3.5 Data Collection Process

Two independent reviewers (M.A., L.H.) designed a data extraction form to extract data from eligible studies. Any disagreement about the collected data was resolved through discussion.

3.6 Data Items

One researcher (A.H-M) read the included studies in this review and summarized them in the following table (Table 1). Table 1 consists of the following: author, title, aim, design, sample, and results.

3.7 Study Risk of Bias Assessment

Two researchers (M.A. and A. H-M) assessed the risk of bias in all studies. The Quality Assessment Tool (QAT) checklist was used to evaluate the quantitative studies, while the Critical Appraisals Skills Program (CASP) index was used to assess the qualitative studies. Any disagreement was resolved by a third reviewer (EA).

3.8 Synthesis Methods

Data were analyzed and synthesized by three researchers (M.A. MBH and A.H-M). Data were presented in table 1 and the narrative synthesis below.

4. Results

4.1 Study Selection

This search yielded 1544 records. After removing duplicates and screening the titles and content of the abstract, the total number of articles was 19. The PRISMA 2020 flow diagram (Figure 1) explains the search and selection strategy.

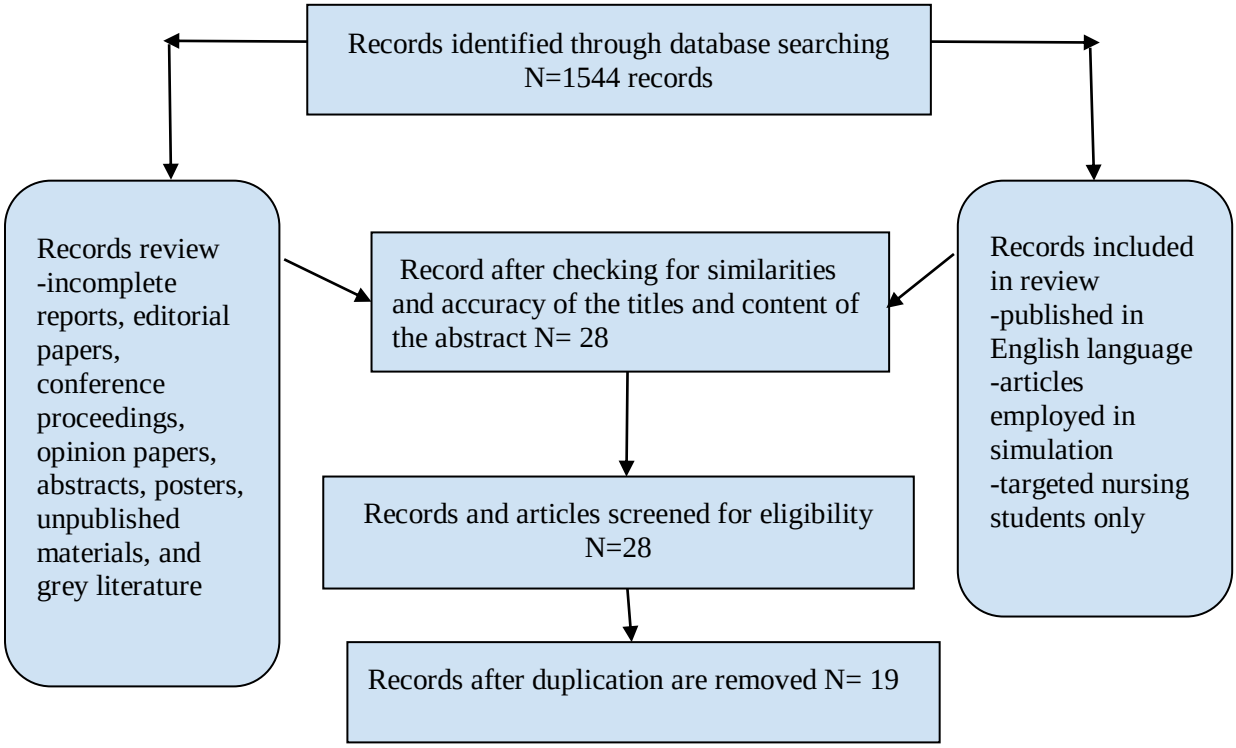

Figure 1 PRISMA 2020 flow diagram

4.2 Study Characteristics

Nineteen articles published between 2008 and 2022 were included in the final review. Most of the selected studies were quantitative research studies, followed by qualitative research studies, and lastly, mixed-methods studies. The research studies utilized different types of simulation. Of the 19 studies, only one study used meta-analysis, three used systematic review, six used quasi-experimental, six used a qualitative approach and one mixed methods design. The other two studies have used cross-sectional to assess perception and learning experiences. Each included analysis in this review was summarized and described in terms of authors, year of publication, aim, methodology, and main results. Table 1 shows a summary of the included studies.

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Table 1 Summary of the included studies.

Reference	Aim	Methodology	Main results
[17]	The study aims to evaluate the effect of concept mapping on problem-solving skills, competence in clinical settings, and knowledge among undergraduate nursing students.	A quasi-experimental design was used to collect data from 60 students from the medical, surgical, and community health nursing departments.	The study showed significant improvements in students' knowledge about concept maps, simulation, case study rubrics, and problem-solving skills; moreover, students had positive perceptions regarding the application of concept mapping in clinical settings.
[18]	The study aims to assess students' clinical judgment at different stages of their nursing program.	A descriptive cross-sectional study collected data from 55 junior nursing students.	The study showed that many junior nursing students were capable of critical analysis and classifications of error, risks, and associated factors. Study results on error classification, associated risk, and potential contributors, the general agreement of the students was moderate.
[19]	The meta-analysis investigates the effectiveness of different scaffolding types and technology in simulation-based learning environments to facilitate complex skills.	A meta-analysis Summarizes 145 empirical studies.	The meta-analysis concluded that (1) simulations are among the most effective means of learning complex skills across domains and (2) different scaffolding types can facilitate simulation-based learning during different phases of developing knowledge and skills.
[20]	This study aimed to examine the impact of high-fidelity simulation on developing clinical judgment and motivation among nursing students.	A quasi-experimental design was used to collect data from 56 nursing students.	The study showed that nursing students exhibited significant clinical judgment and motivation improvement from exposure to high-fidelity simulation.
[21]	This study aimed to explore students' experience of the benefits of high-fidelity simulation in nursing education.	A qualitative study using an open-ended questionnaire to collect data from eight nursing students.	The study results revealed four major themes were identified: "Bridging Theory to Clinical Practice," "Developing Critical Thinking and Decision-making," "Practicing Safely Leads to Enhancing Confidence," "Teamwork Spirit and students' motivation to earn and practice more."
[22]	This study aims to assess the effect of high-fidelity	A quasi-experimental design was used with	The study's results revealed that the mean HESI test scores

	simulation on student knowledge, retention of knowledge, and perception.	37 senior-level nursing students. /	decreased following the simulation intervention, although an analysis of variance (ANOVA) determined that the difference was not statistically significant.
[11]	The study explores the influence of simulation experiences on nurses' clinical judgment.	The qualitative thematic approach was performed using in-depth interviews.	The study results showed that high-fidelity simulation provided students with opportunities to think and act in the nursing role, thus supporting their ongoing development of clinical judgment. It also contributed to enhanced learning in clinical settings.
[23]	The study aims to develop and assess simulated voice hearing as an alternative learning tool.	The qualitative thematic approach for eighty nursing students' responses undertaking a mental health course.	The results showed three primary learning outcomes: developing an understanding of voice-hearing, increasing students' awareness of its impact on functioning, and considering the communication skills necessary to engage with consumers who hear voices.
[24]	The study aimed to describe the clinical psychiatric nursing experiences of undergraduate students.	A mixed-method design was used with 160 nursing students.	One hundred sixty respondents reported concerns such as the availability and quality of clinical sites, poor nursing role models, number of clinical hours, and lack of valuing their expertise. Only a small number of respondents reported using simulated experiences to help develop clinical skills.
[25]	The article aims to describe various simulators and simulated experiences, including role-playing, standardized patients, partial task trainers, complex task trainers, integrated simulators, and complete mission simulations. And to present the use of simulation in undergraduate nursing programs, continuing education programs, interdisciplinary team training, and competency	This review article describes simulation techniques currently used in healthcare education and identifies future directions for using simulation in healthcare.	The author concludes that the next steps in using simulation to strengthen healthcare provision include providing healthcare educators with the motivation and competencies needed to create and use meaningful simulation learning experiences and initiating more research regarding the benefits of simulation in healthcare education.

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	assessment.		
[26]	Examine the effect of high-fidelity simulation (HFS) intervention on clinical	The pretest-posttest control design was conducted with hundred fifty students.	The results showed that the control and intervention groups noticed a significant change in clinical decision-making after implementing the intervention. Therefore, high-fidelity simulation intervention was effective.
[27]	This study aims to investigate the experience of baccalaureate nursing (BSN) students with the clinical simulation of hearing distressing voices and derive themes from the written reflective data of students' evaluative statements.	A qualitative study was used with 74 baccalaureate nursing (BSN) students.	The findings support the simulation's value in promoting active and practical learning in BSN students as they enter psychiatric-mental health clinical rotations.
[1]	The study aims to examine simulation in a problem-based Course.	A descriptive qualitative research design with a convenience sample of 19 nursing students.	The study's findings highlighted the educational value of integrating simulation-based learning in a problem-based theoretical nursing course. Students commented on the importance of understanding new knowledge in the classroom context with the following thematic perceptions: 1) bridging theory and practice, 2) integrating knowledge from other courses, 3) enhancing confidence for practice, 4) learning together, and 5) learning in a safe environment.
[28]	This systematic literature aims to review the literature on various simulation techniques utilized in undergraduate mental health nursing education.	Systematic literature review using 15 eligible articles.	The findings indicate that the simulation effectively increases students' skills in therapeutic communication, critical thinking, problem-solving, decision-making, and risk assessment in mental health nursing practice.
[9]	This systematic review critically appraised the scientific articles that covered the effect of utilizing high-fidelity simulation on nursing students' anxiety and self-confidence during	A systematic review of scientific articles was reviewed.	This review provides updated evidence on the efficacy of high-fidelity simulation in reducing anxiety and enhancing self-confidence among nursing students when performing nursing duties.

	undergraduate nursing education.		
[29]	To examine nursing students' perceptions and satisfaction after participating in a targeted mental health course in which primary specialist skills were acquired via clinical simulation.	A quantitative, descriptive, transversal study	The participants reported high satisfaction with the OSCE procedure and observed that this method should be implemented more frequently.
[30]	The purpose of this paper was to describe the utilization of simulated psychiatric nursing situations involving drug or alcohol abuse that the practicing nurse may encounter in a general hospital setting.	The research design for this study is a descriptive, post-test-only design.	High-fidelity clinical education simulations effectively facilitate student learning of psychiatric and mental health clinical experiences. Students found simulation to be a valuable and engaging way to learn to care for clients with drug or alcohol abuse disorders.
[31]	This study aimed to describe nursing students' perceptions of simulations in preparation for their clinical placement in mental health nursing.	A qualitative descriptive design was selected—twenty-four undergraduate nursing students.	The results showed three main themes: (1) a preview into everyday life in a psychiatric ward, (2) adjusting assumptions and apprehensions regarding mental health nursing, and (3) mutual respect during the nurse-patient meeting.
[32]	This article aims to introduce therapeutically communication simulations with particular emphasis on symptoms related to psychiatric disorders as a part of mental health theory and clinical courses.	A quasi-experimental, one-group, pre-posttest design using simulation during a mental health clinical orientation.	This study's results indicate that students self-reporting their confidence in their communication skills improved to post a standardized patient mental health simulation.

4.3 Impact of simulation on knowledge and mental skills

The analysis of the reviewed studies revealed significant improvements in students' knowledge about concept maps, simulation, case study rubrics, and problem-solving skills [17- 21]; students had positive perceptions regarding simulation as a valuable learning experience that enhanced their knowledge. Moreover, different studies [17- 21] found that nursing students exhibited significant improvement in clinical judgment and motivation, knowledge retention, and opportunities to think and act in the nursing role and thus supported their ongoing development of clinical assessment contributed to enhanced learning in clinical settings and significant change in clinical decision-making. The simulations were valuable in preparing students for mental health clinical placements by increasing their belief in their capability to act appropriately in clinical scenarios [18]. Nurse educators have published numerous studies outlining the use

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of simulation as part of the nursing curriculum, with evidence that knowledge is increased because of simulation exercises [17-19-22].

The qualitative data showed that faculty members found simulation more beneficial in students' evaluation and less stressful than their previous evaluation process. This support a very recent study that eLearning experiences were compelling among nursing students and that faculty members were able to identify success factors towards making online education effective [15], [16].

4.4 Impact of simulation on educational capacity

The reviewed studies showed that simulation generally has promising learning and teaching outcomes. Two studies [2732] reported that strengthening healthcare provision includes providing healthcare educators with the motivation and competencies needed to create and use meaningful simulation learning experiences and initiating more research regarding the benefits of simulation in healthcare education. In addition, these studies highlighted the educational value of integrating simulation-based learning in a problem-based theoretical nursing course. Students commented on the importance of understanding new knowledge in the classroom context with the following themes perceptions: 1) bridging theory and practice, 2) integrating knowledge from other courses, 3) enhancing confidence for practice, 4) learning together, and 5) learning in a safe environment. There was also evidence that simulation contributed to lower anxiety levels among students, allowing for better educational outcomes and exam performance. Literature found that self-confidence was one of the most identified benefits of simulation exercises for nursing students [9]. Within psychiatric courses, simulation featuring live actors has been well established to develop communication skills and decrease anxiety for undergraduate nursing students [9].

4.5 Impact of simulation on students' safety practice

The reviewed studies showed that simulation significantly improved safety practices and students' perception of comforting experience and learning through simulation and role modeling rather than routine clinical training. Students showed capability for critical analysis and classifications of error and risk factors [18]. The same study indicated that nursing students could critically analyze errors and risks [18]. There was also an agreement among students and instructors that simulations facilitate the learning of complex skills and simulation-based education safely [1], [19]. Another qualitative study revealed that practicing safe procedures enhances confidence and students' motivation to earn and practice more [20], [21]. The significant benefits of using simulation in nursing education are sustained by the principles of safety practices [23]. A meta-analysis study reported that the analyzed studies indicate that the simulation effectively increases students' communication skills, risk assessment, critical thinking, decision-making, and problem-solving in mental health nursing practice [28]. Using simulation can be very useful in the mental health field since it facilitates student training within a controlled, safe environment and simultaneously provides an opportunity for the active participation of students. It is focused on error prevention, immediate feedback, and the creation of an appropriate training environment where students will feel and be psychologically safe, will communicate among themselves, and be able to review the process [29].

5. Discussion

A systematic review has been conducted to understand the effectiveness of simulation on students' clinical skills in the field of psychiatric nursing. A total of 1544 studies, including original articles, dissertations, and grey papers, have been reviewed. Of these, 19 articles met the inclusion criteria. Although simulation has been used initially for technology and military services with various forms of application, simulation has become an essential need for nurses. Shifting to online education and the extensive reliance on

platforms have created and sustained the need for using simulation for nurses to compensate for clinical training [33]. This has been addressed as one significant need during the COVID-19 pandemic. We found that nurse educators have used simulation as a learning tool, which is effective for many gained outcomes [20], [21]. Simulation has been linked to positive health psychiatric nursing education, enhanced motivation for learning among students, sustained the principles of safety practices, and did allow for time and interaction between instructors and students in an anxiety-free learning environment [34], [35]. Such findings will encourage nurse educators to rely more on online modes such as simulation to enhance and integrate the theory and practice of psychiatric nursing care with nursing students. The international crises noted during the pandemic of COVID-19 showed the need to have and use blended learning for nursing students. Simulation with psychiatric nursing students was effective in this review [21]. Therefore, it might be advisable to sustain the use and develop the methods and enhance objectives that enable using simulation in psychiatric nursing. This needs to be integrated into nursing curricula and is essential to learning and teaching psychiatric nursing platforms. In particular, the focus on research addressing the mental health of nursing students mainly asserts relating academic factors and their well-being rather than their clinical training and simulation or using advanced technology in education and training [36], [37].

Three of the 19 studies implemented simulation to measure motivation for learning outcomes using a self-report questionnaire and active monitoring. Measuring the impact of simulation depended on students' perception of the learning experience [37]. Although the subjective measure is needed and can help explore the perception of students' experiences, using an objective standard, such as measuring the impact of using simulation on the quality of psychiatric care provided by students and the level of risk attained by students with emphasis on differences between those who used simulation and those are not one essential component [38], [39]. This will enable the nurse educators and curriculum development staff to integrate simulation and blended learning formats into nursing curricula. Since 2015, studies have remained the same and focused on using objectives rather than subjective measures of simulation outcomes [40]. One possible rationale is related to the fact that researchers and nurse educators were focusing mainly on measuring students’ experiences and the impact of nurses' skills and accumulated knowledge. It has been noticed that simulation use in psychiatric nursing care has ignored patient safety measures and directly impacted the effectiveness of psychiatric nursing training [39- 41]. Thus, there is a need to use subjective formats for evaluation, such as narratives, oral and written diaries, and observational methods, to evaluate the effectiveness of simulation on psychiatric nursing care. Observational methods could be essential to ensure patient safety and avoid international medical and nursing errors.

Although the review of the 19 studies reported positive outcomes of simulation use in psychiatric nursing education and training, we lack RCTs that might reveal a more robust and evaluative approach to simulation effectiveness. Our findings were inconclusive regarding the types of studies that have tailored simulation to nursing programs. Such an issue reveals that differences in nursing curricula might also interfere with the effectiveness of simulation in psychiatric nursing education and training, which has been reported in several studies and across health disciplines [41], [42]. Another issue was the availability of nursing informatics and simulation expertise, which was also recognized as a significant component in making simulation a successful learning experience for students [43], [44]. Most of the studies, the 19 ones, have recommended that there should be an expert who can trailer and manage students' needs for learning and training of course time. The need to integrate information technology such as nurse informatics and health informatics into nursing curricula enhances blended learning and creates a safe environment for training for students [45], [46].

There are several limitations to this study. First, short-term training and lack of longitudinal studies and

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RCTs have not been reported adequately because nurse educators were more encouraged to use simulation in basic nursing courses such as cardiac training (advanced cardiac life support) and clinical evaluation courses (physical examination and measuring vital signs). Another limitation was lacking comparative studies that examine the effectiveness of simulation in psychiatric nursing education and training according to gender, types of nursing courses, and time. On the other hand, resources and facilities capability, human and technical. Have not been addressed as part of the confounding factors that might influence the simulation outcomes in psychiatric nursing education and training.

6. Conclusion

In summary, this article advocates using simulation as a teaching strategy in undergraduate psychiatric nursing education. As technology evolves in our society, educational institutions must keep their methods of instruction current. Clinical simulation is one example of how educators can apply technology to healthcare. Undergraduate nursing students are becoming exposed to such technology in the educational setting, which translates into acquiring clinical skills. The psychiatric nursing specialty explores the practical applications of clinical simulation by using simulated and standardized patients, high-fidelity patients, immersion scenarios, and technological devices such as headphones, goggles, and avatars. Teaching methods that involve simulation are likely to engage students and help them to practice clinical skills in a safe environment. As students become more comfortable acquiring abilities, their confidence and interest in the field will grow. This sort of student interest and educational success is vital to the future and recruitment of students into the specialty of psychiatric nursing.

Using simulation, nurse educators can provide high-quality clinical experiences that prepare students to care for mental health patients. This is supported by the literature that shows simulation improves students' knowledge, confidence, and skill when providing mental healthcare. There is also a demonstrated association between using simulation and improving students' knowledge, attitudes, and empathy-related to mental illness.

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