



Doctorate Program
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026801



New technology in psychiatric mental health nursing education, practice and research

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Objectives

- **At the end of this discussion, every candidate will be able to:**
- Analyze the Historical Overview of Artificial Intelligence (AI)
- Discuss the Challenges in Psychiatric Mental Health Nursing Education
- Explain the concept of Virtual reality (VR)
- Differentiate the various types VR Training
- Explain the Need for a VR-Based Solution
- Analyze the significance of Implementation of Virtual Reality in Psychiatric Nursing Education

Objectives, cont.

- Explain the concept of Simulation
- Analyze the Conceptual models support the use of simulation in education
- Differentiate between various types of simulation modalities in psychiatric nursing
- Application of simulation in psychiatric mental health nursing

Outlines

- The Historical Overview of Artificial Intelligence (AI)
- The Challenges in Psychiatric Mental Health Nursing Education
- Definition of Virtual reality (VR)
- Types VR Training
- Need for a VR-Based Solution

Outlines

- Implementation of Virtual Reality in Psychiatric Nursing Education
- Definition of Simulation
- Conceptual models support the use of simulation in education
- Types of simulation modalities in psychiatric nursing
- Simulation in psychiatric mental health nursing

Introduction

- In recent years, rapid technological advancements have significantly transformed the field of psychiatric mental health nursing. These innovations are reshaping not only how nurses are educated, but also how mental health care is delivered and how research is conducted. As the global burden of mental health disorders continues to increase, traditional approaches alone are no longer sufficient to meet the growing demand for effective, accessible, and high-quality care.

Introduction

- In psychiatric nursing education, emerging technologies such as simulation, virtual reality (VR), and artificial intelligence (AI) are enhancing learning by providing immersive, interactive, and experiential environments. These tools allow students to develop clinical skills, improve communication, and gain confidence in managing complex and high-risk situations in a safe and controlled setting.

Introduction

- In clinical practice, digital technologies including telepsychiatry, mobile health applications, AI-driven systems, and wearable devices are improving access to care, supporting early diagnosis, and enabling continuous patient monitoring.

Historical Overview of Artificial Intelligence (AI)

1. Early Foundations (1950s–1970s)

- Artificial Intelligence emerged with the development of computer science
- Key pioneers:
 - Alan Turing
 - Newell & Simon
- The main goal:
- To simulate human thinking and problem-solving using machines

Historical Overview of Artificial Intelligence (AI)

- **Early Milestone:**

- **ELIZA (1960s)**

One of the first chatbots simulating a psychotherapist

- Although simple, it introduced the idea of: AI in mental health interaction

Historical Overview of Artificial Intelligence (AI)

2. Rule-Based Systems (1980s)

- Development of **Expert Systems**
- Based on:
 - “If–Then” rules

Applications:

- Diagnosis
- Decision support

Historical Overview of Artificial Intelligence (AI)

Limitations:

- Rigid
- Limited adaptability

3. Computer-Based Therapy (1990s–2000s)

- Emergence of:
 - Computerized Cognitive Behavioral Therapy (CBT)

Purpose:

- Increase access to mental health care
- Provide structured digital interventions

However:

- Limited intelligence
- Lack of personalization

Historical Overview of Artificial Intelligence (AI)

4. Data-Driven AI Era (2010s)

- Rise of:
 - Machine Learning
 - Big Data analytics

AI capabilities expanded to:

- Analyze patient data
- Predict outcomes
- Personalize treatment

This marked a major shift toward: Intelligent mental health systems

Historical Overview of Artificial Intelligence (AI)

5. Modern AI in Mental Health (2020s–Present)

Current Applications:

- AI chatbots (e.g., Woebot, Wysa)
- Speech and emotion analysis
- Predictive algorithms
- Digital phenotyping

Used for:

- Early detection
- Continuous monitoring
- Personalized interventions

AI is now:

- An integral component of modern mental healthcare

Challenges in Psychiatric Mental Health Nursing Education

1. Limited Clinical Exposure

- One of the most significant challenges is the **limited availability of real psychiatric cases** for student training.
- Students may not encounter:
 - Severe mental disorders
 - Crisis situations (e.g., suicidal patients, aggression)

Impact:

- Inconsistent clinical experience
- Unequal skill development among students

Challenges in Psychiatric Mental Health Nursing Education

2. Ethical and Safety Constraints

- Psychiatric settings impose strict ethical limitations:
- Students cannot freely engage with:
 - High-risk patients
 - Vulnerable individuals

Impact:

- Reduced hands-on learning
- Learning becomes observational rather than active

Challenges in Psychiatric Mental Health Nursing Education

3. Student Anxiety and Fear

- Psychiatric nursing students commonly experience:
- Fear of patient interaction
- Anxiety about unpredictable behaviors

Impact:

- Avoidance of engagement
- Poor communication skill development
- Reduced confidence

Challenges in Psychiatric Mental Health Nursing Education

4. Unpredictability of Patient Behavior

Psychiatric patients may present with:

- Rapid mood changes
- Aggression
- Psychosis

Impact:

- Difficulty in standardizing training
- Challenges in assessing student performance

Challenges in Psychiatric Mental Health Nursing Education

5. Theory–Practice Gap

A major issue in nursing education:

- Students understand theory but struggle to apply it in real clinical situations
- **Causes:**
- Limited practice opportunities
- Lack of experiential learning

Challenges in Psychiatric Mental Health Nursing Education

6. Stigma Toward Mental Illness

- Some students hold negative attitudes or misconceptions about psychiatric patients.

Impact:

- Reduced interest in psychiatric nursing
- Weak therapeutic relationships

Challenges in Psychiatric Mental Health Nursing Education

7. Limited Clinical Resources

- Shortage of psychiatric training sites
- Limited supervision by experienced professionals

Impact:

- Overcrowded training environments
- Reduced quality of education

Challenges in Psychiatric Mental Health Nursing Education

8. Traditional Teaching Limitations

- Conventional teaching methods rely on:
- Lectures
- Observation

Impact:

- Passive learning
- Limited skill development
- Poor critical thinking

Challenges in Psychiatric Mental Health Nursing Education

9. Lack of Standardization

Each student may experience different:

- Patients
- Situations

Impact:

- Inconsistent learning outcomes
- Difficulty in evaluation

Challenges in Psychiatric Mental Health Nursing Education

10. Emotional and Psychological Burden

- Psychiatric training can be emotionally demanding:
- Exposure to:
 - Trauma
 - Suicide
 - Severe mental illness

Impact:

- Stress and burnout
- Emotional withdrawal

Key Technological Innovations in Psychiatric Nursing Education

Virtual Reality (VR):

Virtual Reality (VR): is **A computer-generated, immersive, and interactive environment** that simulates real-life scenarios, allowing users to engage through sensory experiences such as vision, sound, and movement.

It creates a **safe, controlled simulation of reality** without exposing users to actual risk.

Key Concept:

Users are aware the environment is artificial

However, their brain responds as if it is real

This is known as:

Sense of Presence

Key Technological Innovations in Psychiatric Nursing Education

Virtual Reality (VR):

Virtual Reality (VR) is an advanced digital technology that:

Creates a fully or partially immersive, computer-generated environment that simulates real-life experiences and allows users to interact with virtual elements in real time.

Core Components of VR

Core Components of VR:

1. Immersion

Degree to which the user feels “inside” the environment

Achieved through:

- Head-mounted displays (HMDs)

- 3D visuals

- Surround sound

2. Interaction

User can:

- Move

- Speak

- Make decisions

System responds in real time

Core Components of VR

3. Presence (MOST IMPORTANT)

The psychological feeling of “being there”

- Even if the environment is artificial
The brain reacts as if it is real

Why This Matters in Psychiatry?

Because psychiatric care depends on:

Emotional response

Behavioral reaction

VR triggers **real emotional and cognitive responses**

Types of VR Training

1. Immersive Virtual Reality (IVR)

Immersive Virtual Reality refers to:

A fully immersive digital simulation where the user is completely surrounded by a virtual environment using head-mounted displays (HMDs) and motion-tracking systems.

Key Features:

360-degree visual environment

Head and body tracking

Real-time interaction

High sense of presence

Types of VR Training

Educational Mechanism:

Immersive VR creates a **realistic clinical experience** where students:

Feel physically present

React emotionally

Engage cognitively

Applications in Psychiatric Nursing:

Suicide risk assessment training

Managing aggressive or psychotic patients

Crisis intervention scenarios

Therapeutic communication practice

Types of VR Training

Advantages:

- High realism and engagement
- Strong emotional and behavioral responses
- Enhances empathy and clinical confidence

Limitations:

- Expensive equipment
- Risk of cybersickness (dizziness, nausea)
- Requires technical infrastructure

Types of VR Training

2. Non-Immersive Virtual Reality (Desktop VR)

Non-immersive VR is:

A computer-based simulation where users interact with a virtual environment through a screen without being fully immersed.

Key Features:

Displayed on standard monitors

Limited interaction

No full sensory immersion

Types of VR Training

Educational Mechanism:

Focuses on **cognitive learning** rather than emotional immersion

Suitable for:

- Basic training

- Concept introduction

Applications:

- Case-based simulations

- Clinical decision-making exercises

- Virtual patient interviews

Types of VR Training

Advantages:

- Cost-effective
- Easy to implement
- Accessible to large groups

Limitations:

- Lower engagement
- Limited emotional realism
- Reduced sense of presence

Types of VR Training

3. Simulation-Based VR Training

Simulation-based VR training is:

The use of virtual scenarios and simulated patients to replicate real clinical situations for training purposes.

Key Features:

- Structured clinical scenarios
- Standardized learning experiences
- Safe practice environment

Types of VR Training

Educational Mechanism:

Allows students to:

- Apply theoretical knowledge
- Practice clinical reasoning
- Develop decision-making skills

Applications:

- Mental status examination
- Patient assessment
- Communication training
- Diagnosis and care planning

Types of VR Training

Advantages:

- Safe environment (no risk to patients)
- Repeatable scenarios
- Consistent training across students

Limitations:

- May lack full realism
- Depends on scenario quality
- Limited emotional complexity compared to real patient

Types of VR Training

4. Virtual Reality Exposure Training (VRET)

Virtual Reality Exposure Therapy (VRET) is:

A training approach that uses VR to gradually expose users to anxiety-provoking or stressful stimuli in a controlled environment.

Key Features:

- Gradual exposure (graded difficulty)
- Controlled simulation
- Repeatable experiences

Types of VR Training

Educational Mechanism:

Based on:

Behavioral therapy principles

Process:

- Exposure to stimulus
- Emotional activation
- Adaptation and coping
- Anxiety reduction

Types of VR Training

Applications:

- Phobia training (e.g., crowds, confined spaces)
- PTSD simulation
- Anxiety management
- Emotional regulation training

Types of VR Training

Advantages:

- Safe exposure to difficult situations
- Controlled environment
- Enhances coping skills

Limitations:

- May not fully replicate real-life unpredictability
- Requires supervision in some cases

The Need for a Virtual Reality (VR)

1. The Core Problem: Limitations of Traditional Psychiatric Nursing Education

1.1 Limited Clinical Exposure

One of the most significant challenges in psychiatric nursing education is the **limited availability of diverse clinical cases**.

Students are not exposed to:

- Rare psychiatric conditions

- High-risk situations (e.g., suicidal behavior, severe psychosis)

As a result:

Learning becomes inconsistent

Clinical competence varies among students

The Need for a Virtual Reality (VR)

1.2 Ethical and Safety Constraints

Psychiatric training is heavily restricted by ethical considerations:

Students cannot freely interact with:

- Suicidal patients

- Aggressive or unstable individuals

Due to:

- Patient safety

- Legal responsibility

Impact:

Learning becomes:

- Observational rather than participatory

- Passive rather than experiential

The Need for a Virtual Reality (VR)

1.3 Unpredictability of Psychiatric Patients

Psychiatric patients often present with:

Variable behaviors

Unpredictable emotional responses

Even the same diagnosis may present differently across patients

Consequence:

Difficult to standardize training

Challenging to assess student performance objectively

The Need for a Virtual Reality (VR)

1.4 Student Anxiety and Fear

Research shows that psychiatric nursing students often experience:

Anxiety

Fear of patient interaction

Emotional discomfort

Effect on Learning:

Reduced engagement

Avoidance of patient interaction

Poor development of communication skills

The Need for a Virtual Reality (VR)

1.5 The Theory–Practice Gap

A well-documented issue in nursing education:

Students understand theoretical concepts but struggle to apply them in real clinical settings.

Causes:

Limited hands-on practice

Insufficient exposure to real scenarios

The Need for a Virtual Reality (VR)

2. Why VR is a Necessary Solution

2.1 Controlled and Structured Learning Environment

Virtual Reality provides:

A fully controlled, standardized, and risk-free clinical environment

✓ Educators can control:

Scenario complexity

Patient behavior

Learning objectives

The Need for a Virtual Reality (VR)

2.2 Safe Exposure to High-Risk Scenarios

VR allows students to train in situations that are:

Dangerous

Ethically restricted

Rare in clinical settings

Examples:

Suicide risk assessment

Managing aggressive patients

Acute psychotic episodes

Key Insight:

VR enables exposure to critical scenarios without compromising patient safety.

The Need for a Virtual Reality (VR)

2.3 Repetition and Mastery-Based Learning

In traditional settings:

Students may encounter a scenario once or not at all

In VR:

✓ Scenarios can be repeated indefinitely

Until competence is achieved

This supports:

Mastery learning, where performance improves through repetition and feedback.

The Need for a Virtual Reality (VR)

2.4 Standardization of Clinical Training

Traditional education:

Different students encounter different cases

VR-based education:

✓ All students experience:

The same scenario

The same level of difficulty

This ensures:

Fair assessment

Consistent learning outcomes

The Need for a Virtual Reality (VR)

2.5 Experiential Learning Approach

VR shifts learning from:

☐ Passive observation



☐ Active participation

Students:

- Make decisions
- Experience consequences
- Reflect and improve

The Need for a Virtual Reality (VR)

2.6 Emotional and Psychological Skill Development

Psychiatric nursing is not only cognitive—it is deeply emotional.

VR allows students to experience:

- Stress
- Anxiety
- Emotional pressure

In a safe environment

Key Insight:

VR trains both cognitive and emotional competencies simultaneously.

The Need for a Virtual Reality (VR)

2.7 Integration of Knowledge, Skills, and Behavior

VR training integrates:

- Theoretical knowledge
- Clinical skills
- Behavioral responses

Example:

A student:

Asks an inappropriate question

Observes patient reaction

Adjusts behavior in real time

The Need for a Virtual Reality (VR)

2.8 Evidence-Based Effectiveness

Research demonstrates that VR improves:

Clinical knowledge

Communication skills

Self-efficacy

Confidence in psychiatric practice

Key Components of VR Implementation

Key Components of VR Implementation

1- Technology Infrastructure

Required Elements:

VR headsets (HMDs)

Software platforms

Simulation scenarios

Computer systems

Key Components of VR Implementation

Optional Enhancements:

Motion tracking

Audio interaction

AI-driven virtual patients

2- Scenario Design

Critical Element:

The effectiveness of VR depends on the quality of scenario design.

Scenarios should include:

Realistic psychiatric cases

Clear learning objectives

Progressive difficulty levels

Decision points

Key Components of VR Implementation

Examples:

Suicidal patient interview

Psychotic episode management

Anxiety disorder assessment

Key Components of VR Implementation

3. Instructional Design

Structured Learning Process:

1. Pre-Briefing

Introduce objectives

Explain scenario context

Prepare students emotionally

2. Simulation Experience

Students interact with virtual patients

Perform assessments and interventions

Key Components of VR Implementation

3. Debriefing (MOST IMPORTANT)

Reflection phase where learning is consolidated

Includes:

Feedback

Discussion

Error analysis

Debriefing is essential for:

transforming experience into learning

Key Components of VR Implementation

4- Learner Engagement

Students should:

Actively participate

Make decisions

Reflect on actions

Passive observation reduces effectiveness

Key Components of VR Implementation

5- Assessment and Evaluation

Methods:

Performance evaluation

Skill checklists

Reflection reports

Instructor feedback

Outcomes measured:

Knowledge

Communication skills

Confidence

Clinical reasoning

Challenges in Implementation of VR

1- Cost and Resources

Equipment and software

2-Technical Issues

System errors

Hardware limitations

3- Faculty Training

Educators need digital skills

4- Limited Realism

Cannot fully replace real patients

5- Accessibility Issues

Not all institutions can afford VR

Blended Learning Model

The Ideal Approach: Blended Learning Model

Optimal Educational Model:

VR-Based Simulation

Real Clinical Practice

Concept:

VR = Preparation

Clinical practice = Application

Key Statement:

VR prepares students for clinical reality, but real-world experience completes their professional competence.

Simulation in Psychiatric Mental Health Nursing Education

1. Definition of Simulation

Simulation is: The artificial representation of a real-world clinical situation designed to replicate essential aspects of practice, allowing learners to develop knowledge, skills, and decision-making abilities in a safe, controlled environment without risk to patient

Simulation in Psychiatric Mental Health Nursing Education

Key Characteristics of Simulation:

1. Realism (Fidelity)

The degree to which simulation reflects real clinical situations

2. Interactivity

Learners actively participate, make decisions, and observe outcomes

3. Safety

No risk to patients

Errors become learning opportunities

4. Repeatability

Scenarios can be repeated multiple times

Supports mastery learning

Key Insight:

Simulation is not just a teaching tool—it is a structured learning methodology grounded in educational theory

Conceptual Models Supporting Simulation

1 Experiential Learning Theory (Kolb)

Core Principle:

Learning occurs through experience and reflection

Learning Cycle:

Concrete Experience → engaging in simulation

Reflective Observation → analyzing performance

Abstract Conceptualization → understanding concepts

Active Experimentation → applying improved behavior

Conceptual Models Supporting Simulation

Application:

Simulation allows students to:

- Experience clinical situations
- Reflect on their actions
- Improve performance

Conceptual Models Supporting Simulation

Application:

Simulation allows students to:

- Experience clinical situations
- Reflect on their actions
- Improve performance

Conceptual Models Supporting Simulation

2 Transformative Learning Theory (Mezirow)

Core Principle:

Learning occurs when learners face a **disorienting dilemma**

In Simulation:

Students encounter challenging situations

Experience uncertainty or discomfort

Re-evaluate their assumptions

Result:

Deep learning and critical thinking development

Conceptual Models Supporting Simulation

3 Constructivist Learning Theory

Core Principle:

Knowledge is actively constructed through experience

In Simulation:

Students:

- interact

- explore

- build their own understanding

Insight:

Learning becomes learner-centered, not teacher-centered

Conceptual Models Supporting Simulation

4 Situated Learning Theory

Core Principle:

Learning is most effective when it occurs in context

In Simulation:

Students learn within realistic clinical environments

Result:

Improved transfer of knowledge to real practice

Application of Simulation in Psychiatric Mental Health Nursing

Application of Simulation in Psychiatric Mental Health Nursing

Unique Nature of Psychiatric Nursing

Psychiatric nursing focuses on:

- Communication
- Emotional interaction
- Behavioral assessment

Challenges:

- Patients are unpredictable
- Situations are high-risk
- Ethical limitations restrict student involvement

Application of Simulation in Psychiatric Mental Health Nursing

Role of Simulation:

Simulation enables:

- Safe practice of complex interactions
- Exposure to critical scenarios
- Development of clinical judgment
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Application of Simulation in Psychiatric Mental Health Nursing

Core Applications

1 -Therapeutic Communication

Establishing trust

Active listening

Managing difficult conversations

2- Mental Health Assessment

Mental Status Examination (MSE)

Behavioral observation

3- Crisis Intervention

Suicide risk management

Aggressive patient handling

Acute psychosis

Application of Simulation in Psychiatric Mental Health Nursing

4- Clinical Decision-Making

Selecting interventions

Evaluating patient responses

5- Empathy Development

Understanding patient emotions

Developing emotional intelligence

Evidence:

Simulation improves:

- Clinical skills
- Communication
- Confidence

Simulation Modalities in Psychiatric Nursing

Simulation in psychiatric mental health nursing education relies on multiple modalities to replicate clinical reality.

Each simulation method targets different dimensions of learning: cognitive, behavioral, and emotional.

The three primary modalities are:

- High-fidelity mannequins
- Standardized patients (actors)
- Virtual simulation tools (VR and digital systems)

Simulation Modalities in Psychiatric Nursing

Simulation Modalities in Psychiatric Nursing

1- High-Fidelity Mannequins

High-fidelity mannequins are:

Advanced computerized patient simulators designed to replicate human physiological and, to a limited extent, behavioral responses in clinical scenarios.

Key Features:

Realistic physiological responses:

- Heart rate

- Breathing patterns

- Voice output (in some models)

Programmable scenarios

Real-time feedback

Simulation Modalities in Psychiatric Nursing

Applications in Psychiatric Nursing:

Although primarily used in medical training, they are applied in psychiatric contexts for:

Psychiatric emergencies (e.g., overdose, agitation with physical symptoms)

Combined physical and mental health scenarios

Medication management and side effects

Advantages:

1. High physiological realism

Simulates body responses accurately

2. Safe clinical environment

Students can practice without harming patients

3. Repetition and standardization

Same scenario can be repeated for all learners

Simulation Modalities in Psychiatric Nursing

Limitations:

1. Limited emotional realism

Cannot replicate:

- Emotions

- Facial expressions

- Complex human behavior

2. High cost

Expensive equipment and maintenance

Simulation Modalities in Psychiatric Nursing

Simulation Modalities in Psychiatric Nursing

2- Standardized Patients (Actors)

Definition:

Trained individuals who simulate real patients by acting out clinical scenarios in a consistent and controlled manner.

Key Features:

- Scripted behavior
- Controlled emotional responses
- Real human interaction

Simulation Modalities in Psychiatric Nursing

Applications in Psychiatric Nursing:

This is the **most important modality** in psychiatric education for:

1. Therapeutic Communication

- Active listening
- Verbal and non-verbal interaction

2. Psychiatric Assessment

- Mental status examination
- Behavioral observation

3. Managing Emotional Situations

- Anxiety
- Depression
- Aggression
- Suicidal ideation

Simulation Modalities in Psychiatric Nursing

Advantages:

1. High emotional realism

Realistic human responses

2. Development of interpersonal skills

Builds therapeutic relationships

3. Immediate feedback

Actors or instructors can evaluate performance

Simulation Modalities in Psychiatric Nursing

Limitations:

1. Variability

Different actors may perform differently

2. Resource-intensive

Requires training and coordination

3. Limited scalability

Difficult to use with large groups

Simulation Modalities in Psychiatric Nursing

3- Virtual Simulation (VR-Based)

Definition:

Virtual simulation tools include:

Computer-based or immersive technologies that create simulated clinical environments where learners interact with virtual patients.

Types:

- Immersive VR (headsets)
- Desktop-based simulation
- AI-driven virtual patients

Simulation Modalities in Psychiatric Nursing

Applications in Psychiatric Nursing:

1. High-Risk Scenario Training

Suicide assessment

Crisis intervention

Psychotic episodes

2. Clinical Decision-Making

Choosing appropriate interventions

Evaluating patient responses

3. Repetitive Skill Training

Practicing scenarios multiple times

Simulation Modalities in Psychiatric Nursing

Advantages:

1. Safe and controlled environment

No real patient risk

2. Standardization

Same experience for all learners

3. Scalability

Can be used for large numbers of students

4. Exposure to rare or dangerous situations

Situations not easily available in clinical settings

Simulation Modalities in Psychiatric Nursing

Limitations:

1. Limited human authenticity

Virtual patients cannot fully replicate real emotions

2. Technical challenges

System errors

Equipment limitations

3. Reduced interpersonal depth

Less spontaneous human interaction

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