

Technology and mental healthcare: Benefits and challenges for future directions in mental health nursing

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Abstract

In mental healthcare, significant advances have been made in technologies that assess, diagnose, treat, monitor, promote, and enhance mental health and well-being. These innovations offer flexible, personalized support, lower access barriers, and provide valuable insights into individual and population mental health. Technology has significantly transformed the delivery of psychiatric nursing services, making them more accessible, efficient, and personalized. Nurses should know that individuals with mental health issues may not have access to these technologies. They should have the choice to use these solutions, which should complement—not replace—existing services and not divert resources from other essential care. Significant challenges include data privacy, leaks, and misuse. Regulatory issues arise from a lack of clear, specific rules to safeguard data and promote ethical use of technology. It is also important to create suitable regulatory frameworks for users, professionals, and developers, and involve potential users, families, and caregivers in development and regulation.

Keywords: benefits; challenges; future directions mental health; nursing; technology

Technology is advancing quickly, with many expecting it to offer innovative solutions to mental health challenges. Research indicates a worldwide rise in mental distress. Reports show an increase in mental health issues among children and young people, including more cases of self-harm and suicidal thoughts. Anxiety, stress, and social isolation have impacted many people's mental health. The demand for technological mental health support has grown in recent years, with a significant increase in searches for mental health apps (ITC & Health, 2025). As the use of digital technology increases, research in this area remains somewhat limited (Löchner et al., 2025). A key benefit and possible risk of digital technologies is the vast amount of patient data they generate. This information supports diagnosis, therapy planning, and clinical decision-making. These datasets can forecast behavioral changes and help minimize biases like memory errors and social desirability bias (Seizer et al., 2024).

The future of mental health technology envisions broader access through teletherapy and virtual platforms, enhanced care with AI and machine learning for personalized diagnostics and chatbots, and continuous tracking via wearables and biometrics. It also employs immersive tools like VR and AR to support, not replace, human care, while tackling challenges related to validation, data privacy, and equitable access. In today's hyper-connected world, technology influences not just work and communication but also mental health management. Although often seen as a stressor, technology offers innovative, accessible ways to support emotional well-being. This article discusses how technology can improve mental health, with real-life

Subu, M. A., et al. (2025)

examples (Sari, 2024). Its purpose is also to provide insights into the role of technology in mental health and nursing services, barriers, facilitators, and prospects.

Some Technological Advancements in Mental Healthcare

Telemedicine or telenursing

As telemedicine becomes more embedded in clinical practice, including mental health services, a study by Wilcock et al. (2023) suggests it may be even more vital for preventive and follow-up care than previously thought. Telemedicine impacts the quality of mental health care by analyzing changes in mental health visits, medication adherence, hospitalizations, post-discharge follow-up appointments, and patient mortality rates among patients treated by practices with higher telemedicine use during the first year of the pandemic, compared to those relying mainly on in-person care. Examples include Talkspace, which offers therapy via video or text messaging, and ReGain, which focuses on couples therapy to strengthen relationships without in-person visits. Benefits of teletherapy include greater privacy, especially for those who are uncomfortable visiting clinics, and the provision of a safer emotional space. Overall, telemedicine or telenursing could be an effective way to boost patient-clinician engagement and maintain continuity of care for mental health populations (Wilcock et al., 2023).

Smartphone Apps

Providing sufficient access to mental health services remains a global challenge. Almuqrin et al. (2025) indicate that smartphone apps can present an affordable, accessible, and convenient way to monitor, support, and treat mental health issues. Though many target mild depression and anxiety, some are designed for more severe mental health problems (Löchner et al., 2025). These apps often incorporate therapeutic principles such as cognitive-behavioral therapy (CBT) and relaxation techniques. Smartphone apps are revolutionizing mental health nursing by offering tools for patient self-management (such as mood tracking and coping strategies), enhancing nurse support through communication and data analysis, and increasing access to care for conditions such as depression, anxiety, and psychosis (Almuqrin et al., 2025).

Artificial intelligence

Artificial intelligence (AI) is increasingly integrated into global mental healthcare, transforming and challenging traditional roles of mental health nurses with new AI-powered tools in practice (Milasan & Scott-Purdy, 2025). AI's presence is now widespread in everyday digital activities, including healthcare. The growing interest among AI developers has resulted in a variety of mental health solutions, such as chatbot applications and virtual therapists for

depression and anxiety (Anmella et al., 2023), AI-powered VR therapies for phobias (Gomes et al., 2023), AI-assisted diagnoses and treatments, and personalized care plans created by AI (Koutsouleris et al., 2022). These innovations in AI aim to advance mental health nursing practices. Collaboration among mental health nurses, patients, and AI developers is essential to develop AI tools that foster person-centered care, empowerment, and active engagement (Milasan & Scott-Purdy, 2025). These AI chatbots are designed for emotional assistance: Woebot, grounded in cognitive-behavioral therapy (CBT), helps users manage stress, anxiety, and depression through engaging dialogues (Milasan & Scott-Purdy, 2025).

Immersive Technologies

Virtual Reality (VR) and Augmented Reality (AR) are immersive technologies that are especially effective for exposure therapy, enabling patients to face their fears in a safe, controlled, and immersive environment (Rosebrock et al., 2024). Augmented reality (AR) enhances mindfulness and relaxation exercises by overlaying calming visuals onto the real world. VR and AR—computer-generated 3D environments or enhancements of real settings—are increasingly employed in mental health treatment. This technology enhances both accessibility and cost-efficiency in psychotherapy, often preferred by users over traditional approaches. VR setups usually involve head-mounted displays that deliver visual and auditory stimuli, complemented by tactile and olfactory cues, creating realistic, interactive environments that simulate real-life situations through specialized electronic devices (Emmelkamp & Meyerbröker, 2021).

Wearable Devices/Technology: Monitoring mental health in real-time

Wearable devices such as smartwatches and health bracelets now include tools to monitor mental health indicators. Examples, Fitbit and Apple Watch track heart rate, sleep patterns, and physical activity—key factors influencing mental well-being. These devices collect extensive long-term data on behavior, environment, and physiology. Smartwatches and fitness trackers track indicators such as heart rate, sleep, and activity levels, acting as digital biomarkers for stress, anxiety, and depression. This real-time data enables users and clinicians to monitor progress and take proactive measures (Löchner et al., 2025).

Digital Therapeutics and Neurotechnology

Many software programs that often require a prescription offer evidence-based treatments for specific health conditions. Devices for brain recording and stimulation, once limited to clinicians and researchers, are now accessible to consumers. These devices aim to improve well-being, reduce stress and anxiety, and elevate mood. Furthermore, other neurotechnology tools claim to address

psychiatric and psychological concerns (Borrione et al., 2020).

Ethical Considerations in Technology Mental Health

Many countries have established regulations for mental health technologies. To be considered a medical device, software, tools, and instruments must serve a 'medical purpose'. The same product might not be classified as a medical device in different contexts. The use of technology in mental health nursing raises various ethical issues. These issues emerge with the use of health information systems (HIS), telehealth, and electronic medical records.

Rapport, trust & acceptability

Certain mental health technologies employ intensive monitoring, which can sometimes be perceived as overly invasive. This perception may erode trust in mental health services and the organizations that offer digital tools, leading to reduced utilization. Additionally, if misused, remote monitoring might increase distress and anxiety among individuals with mental health issues, harm the patient-clinician relationship, and infringe on the fundamental human right to privacy. There are ongoing concerns about whether individuals can genuinely provide informed consent for mental health monitoring and support tools, particularly with direct-to-consumer devices. To foster public trust and acceptance, it is essential to involve service users, their families, and care professionals in the research and development of mental health technologies, as well as in the establishment of future regulations and research priorities.

Human connections: Effectiveness and safety

Technology plays a crucial role in connecting people, especially those who are geographically separated but share similar needs and experiences. This is particularly important for individuals with rare conditions, who may have limited opportunities to meet others. As mental health services increasingly adopt contactless, automated approaches, it is vital to consider how reduced human interaction could impact those seeking support. Digital interventions tend to be highly effective because individuals with phobias might prefer addressing their fears virtually rather than in person. This makes VR treatments a convenient and attractive option for many. Although millions use these tools, most commercial applications lack rigorous scientific validation, and existing studies typically involve small samples and lack follow-up data (Woodward et al., 2020).

Aspects concerning data privacy and data security

Data privacy and security are vital concerns in

mental health technology. These apps often gather sensitive information such as sleep patterns, moods, and personal notes. If this data is mishandled or hacked, it can cause serious harm. Developers are required to comply with privacy laws such as GDPR in the EU and HIPAA in the US, but many apps lack transparency about their data use, raising user concerns. Data leaks may also occur due to insufficient security measures, as demonstrated by recent hacks targeting online therapy apps, underscoring the importance of digital security. Clear privacy policies are essential when handling personal data in mental healthcare. The rising adoption of mental health tech in various settings raises concerns about misuse, discrimination, coercion, or commercial exploitation without consent (Burr et al., 2020). There is a growing demand for stronger security measures to safeguard users and victims, as well as increased research into the effects of mental health data breaches.

Challenges and Future Directions

Implementing and utilizing technology in mental healthcare and psychiatric nursing faces several challenges. For example, data security and privacy are primary concerns, as sensitive health data is at risk of cyberattacks, leaks, and misuse. Regulatory issues arise from a lack of clear, specific rules to safeguard data and promote ethical use of technology. Infrastructure and connectivity gaps, especially in rural areas, pose additional challenges. The costs of adopting new technology can be substantial. Resistance from staff and community, along with low digital literacy, requires training and adaptation efforts. Lastly, system integration remains difficult because the mental health sector is still fragmented and lacks proper cohesion. Mental health nurses need ongoing education and skill development in health informatics to ensure that technology serves as a helpful tool rather than an obstacle to delivering high-quality care.

Solutions and adaptations involve competency enhancement, requiring psychiatric nurses to engage in continuous education and training in health technology and informatics. Additionally, psychiatric nurses serve as patient advocates, translating data into meaningful insights and educating patients in the digital age. Robust regulations are crucial for establishing policies that ensure data security and uphold the ethical application of technology in psychiatric nursing. Enhancing health data protection regulations and policies is essential for future solutions. Users should select health apps that have transparent privacy policies. Developers are responsible for implementing strong encryption and performing regular security audits. Digital literacy plays a key role in enabling safe and effective technology use, helping users navigate apps, platforms, and devices with confidence, while also identifying trustworthy sources and avoiding misinformation online. Managing and reducing

screen time can help decrease stress and improve well-being. Devices like apps and wearables offer valuable opportunities for mental health support, and when used responsibly, they can significantly enhance emotional well-being. The future of more inclusive and accessible mental health support depends on technological advancements (Sari, 2024).

Conclusions

Technology does not replace nurses' roles; rather, it enhances them through various digital innovations. Emerging technologies in mental health assessment, monitoring, and treatment are rapidly advancing. They aim to expand treatment options and enhance well-being for individuals and communities. To serve everyone effectively, efforts should focus on building evidence for safety and effectiveness, establishing regulatory frameworks for users, clinicians, and developers, and involving users, families, and care professionals in the development process. Technology must address existing disparities in access to care and prevent them from worsening. It should also ensure resources are not diverted from other critical mental health interventions, such as promoting social interactions and addressing social determinants of mental health issues. The role of technology in mental health nursing involves improving quality and accuracy. Tools like EEG, brain imaging, and CT scans enable earlier and more precise diagnoses. Accessibility is vital; for example, tele-nursing can deliver mental health services to remote areas. Operational efficiency can be enhanced with Electronic Health Records (EHRs), which streamline administrative tasks and data management. Patient engagement is increasingly important, with digital apps and platforms allowing individuals to manage their mental health independently. Decision-making is supported by real-time data and information, helping stakeholders develop effective mental health policies. Moreover, ongoing training for mental health professionals and increasing public digital literacy are vital. Building an integrated digital ecosystem and fostering collaboration among government, private sector, and academia are also key strategies. Finally, technological innovation should be adapted to local needs and emphasize a more humane approach.

Declaration of Interest

The author declares that he has no conflict of interest.

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Data Availability

De-identified data and the study instruments will be made available by the corresponding author upon reasonable request for research purposes, subject to institutional approvals.

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