

Technology-Enhanced Counseling Interventions for Mental Health: A Review of Effectiveness, Challenges, and Future Directions

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Abstract

A global public health challenge, mental disorders impact more than 1 billion people worldwide, resulting in high numbers of years lived with disability. Rates continue to increase for such issues as anxiety, depression, and posttraumatic stress disorder, but access remains far too limited. Shortages of mental health professionals, stigmatization, and accessibility limitations are systemic obstacles to treatment, which were only further amplified by COVID-19, encouraging adoption of technology-enhanced counseling as a solution. This study presents a high-impact summary of available evidence for technology-enhanced counseling approaches, which includes teletherapy, mobile mental health applications, VR therapy, artificial intelligence (AI) chatbots, and just-in-time adaptive interventions. Findings summarized were concerning clinical effectiveness, accessibility, barriers to implementation, and the future of these approaches in modern mental health services. It is concluded that current technology-enhanced approaches are moderately to highly effective for conditions such as depression and anxiety, with clinical outcomes equal or nearly equivalent to those seen in face-to-face therapy and significant gains in accessibility and scalability. Nevertheless, issues such as risks to data privacy, algorithmic biases, the digital divide, issues with empathy and responsibility when using non-human providers, as well as the need for therapist training and regulations, remain a challenge. Future approaches that are based on hybrid models with human intervention are viewed as the most promising, and technology developments in adaptive AI, biosensors worn by the patient, and advanced large language models could allow for the prediction and early treatment of mental illness. Ensuring fair and responsible development of these tools will be essential.

Keywords: Counselling, Technology, Mental health, Public health, and Patients

INTRODUCTION

The most significant public health challenges of the 21st century concern mental health disorders. Today, hundreds of millions of people worldwide suffer from mental disorders which account for a huge number of Years Lived with Disability. The World Mental Health Report indicates that an estimated 125.3 million DALYs worldwide were attributed to mental disorders in 2019, making it one of the leading diseases globally and no reduction had been observed since 1990 (Torous *et al.*, 2020)). Among young people, prevalence is even higher: globally, an estimated

293 million people aged 5–24 (more than one in ten) experienced at least one mental disorder (Kieling *et al.*, 2024). These diseases decrease people's life quality, functional performance and result in immense economic losses as well as heavy burden on society everywhere, no matter their socioeconomic status.

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This widespread mental health crisis is exacerbated by a critical treatment gap, with exceeding 50–75% of patients with mental disorders, not receiving appropriate treatment (Rathod *et al.*, 2017). In LMICs, the treatment gap is of 85–90% or higher, and in high-resource settings only a fraction of the affected population less than half is treated (Sweetland *et al.*, 2014). The critical factor for the gap is the perennial lack of mental health professionals including psychologists, psychiatrists and counselors, as well as the disproportionate allocation and high cost of treatment with waiting lists often too long, and geographic concentration of specialists to urban regions. The urgent need for scalable and accessible interventions has therefore intensified. While traditional face-to-face counseling remains effective, its resource-intensive nature limits reach amid rising demand. This limitation has prompted exploration of innovative delivery models capable of expanding care without requiring proportional increases in specialist workforce (Philippe *et al.*, 2022).

The COVID-19 pandemic dramatically accelerated the integration of technology into mental health services. Lockdowns, social distancing, and strained healthcare systems forced a rapid shift to remote delivery. Telehealth and digital tools, already emerging pre-pandemic, experienced widespread adoption as safe and practical alternatives (Li *et al.*, 2023; Torous *et al.*, 2020). Post-pandemic, this shift has persisted, supported by growing evidence that digital formats can maintain therapeutic benefits while enhancing accessibility, reducing barriers related to location, mobility, and stigma, and supporting timely intervention during periods of heightened mental distress (Li *et al.*, 2023).

Technology enhanced counseling intervention denotes a form of method or strategy of giving psychological assistance and therapeutic services by using digital tools and gadgets. From broadest perspective, the spectrum of technology enhanced counseling intervention includes: telehealth-televideo and telephone delivery of therapy; iCBT; m-Health apps; digital therapeutics; virtual reality-based intervention; and blended/hybrid intervention involving computer with clinician support (Philippe *et al.*, 2022). The modalities of interventions can be self-help without any human involvement or a supplement to therapy delivered by a clinician, or remotely given by a credential professional. The features of technology enhanced counseling intervention, such as real-time communication, automated response, progress tracking, immersion, can facilitate prevention, assessment, treatment, and management of mental health conditions in the long-term period (Torous *et al.*, 2020).

This review examines a wide variety of high impact

and evidence-based data on technology enhanced counseling intervention concerning their effectiveness, implementation and contribution to meet the global mental health need. It reviews technology-delivered and hybrid modalities applied to the treatment and management of common mental health conditions such as depression, anxiety and stress-related disorders in varied populations and settings, the relative efficacy of technology interventions compared to well-established traditional approaches; various obstacles such as digital divide and digital literacy, and the implementation strategies for counseling context.

TYPES OF TECHNOLOGY-ENHANCED COUNSELING INTERVENTIONS

Digital mental health interventions are commonly classified according to delivery mode, degree of human involvement, and technological complexity. As summarized in Table 1, core technologies range from synchronous video and audio platforms used in teletherapy and telepsychiatry, to sensor-enabled mobile applications that support self-monitoring and psychoeducation. More immersive modalities include virtual and augmented reality environments, which enable controlled exposure and skill practice, while artificial intelligence-powered conversational agents provide automated dialogue and real-time feedback. Finally, just-in-time adaptive interventions (JITIs) leverage sensor-driven mobile systems to deliver context-aware, personalized support based on real-time user data (Huang *et al.*, 2025).

One of the most established forms involves teletherapy and telepsychiatry, which deliver counseling and psychiatric services through synchronous videoconferencing or telephone platforms. As Shaker *et al.* (2023) observed, During the last 2 decades, there has been increasing interest in and publication of research studies addressing the effect of telemedicine on psychiatric patients. Research has highlighted several potential advantages of using telemedicine in mental health services. Some of the most apparent advantages of integrating telemedicine in mental health services are enabling clinicians to reach out to patients living in rural areas and patients with mental health difficulties who find it challenging to attend treatment in person (Li Pira *et al.*, 2023). These approaches operate on principles of real-time interactive communication that closely replicate in-person dynamics while removing geographic and logistical barriers. Therapeutic models commonly integrated include CBT, prolonged exposure therapy, and cognitive processing therapy, demonstrating particular utility for conditions such as posttraumatic stress disorder, depression, and anxiety disorders. A meta-analysis by the same authors

further noted, this meta-analysis provided new knowledge on individual telemedicine interventions that were considered equivalent to in-person treatment regarding efficacy, patient satisfaction, working alliance, and attrition rates across diagnoses (Shaker *et al.*, 2023).

Building on remote delivery models, mobile mental health applications extend support through smartphones, offering self-guided or minimally supported interventions featuring mood tracking, psychoeducation, and interactive skill-building exercises (Li Pira *et al.*, 2023). These applications function through principles of high accessibility and sustained user engagement, often utilizing push notifications, gamification elements, and continuous data logging. Many incorporate core CBT principles, mindfulness practices, or solution-focused techniques, enabling users to rehearse therapeutic skills with varying levels of clinician oversight (Haque *et al.*, 2023; Huang *et al.*, 2025).

Advancing further into immersive technologies, virtual reality (VR) and augmented reality (AR) therapy generate controlled digital environments for therapeutic exposure and skill rehearsal. Zeng *et al.* (2025) reported in their meta-analysis that compared with conventional interventions, virtual reality therapy significantly improved the symptoms. Similarly, Massanneck *et al.* (2026) highlighted that Immersive virtual reality psychotherapy for children and adolescents. Emerging immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR) offer new possibilities for providing novel, engaging, playful, and fun experiences. These systems rely on principles of customizable, safe simulations that facilitate graduated exposure while preserving therapeutic safety. Integrated therapeutic models typically center on exposure therapy for phobias and PTSD, mindfulness training, and social skills development, showing strong potential for anxiety, depression, and certain neurodevelopmental conditions (Bell *et al.*, 2020; Li Pira *et al.*, 2023).

Table 1. *Types of Technology-Enhanced Counseling Interventions*

Type	Core Technology	Operational Principles	Integrated Therapeutic Models	Primary Applications
Teletherapy & Telepsychiatry	Videoconferencing platforms	Real-time synchronous audio-visual interaction	CBT, Prolonged Exposure Therapy, Cognitive Processing Therapy	Depression, Anxiety, PTSD
Mobile Mental Health Applications	Smartphone apps with notifications & sensors	Self-monitoring, psychoeducation, gamification	CBT, Mindfulness-Based Interventions, Solution-Focused Therapy	Mood tracking, General wellness, Stress management
Virtual Reality & Augmented Reality Therapy	Immersive VR/AR environments	Controlled simulated exposure and skill practice	Exposure Therapy, Mindfulness, Social Skills Training	Phobias, PTSD, Anxiety disorders, ADHD
Artificial Intelligence & Chatbot-Assisted Counseling	Natural Language Processing & Conversational AI	Automated dialogue, real-time feedback	CBT, Acceptance and Commitment Therapy (ACT), Motivational Interviewing	Accessible support, Emotional regulation, Mild depression & anxiety
Just-in-Time Adaptive Interventions (JITAI)	Sensor-driven mobile systems with real-time data	Context-aware, personalized intervention delivery	Behavioral Activation, CBT techniques, Stress Management	Momentary mood regulation, Substance use, Behavioral change

Sources: Rahsepar Meadi *et al.* (2025) Zeng *et al.* (2025); Massanneck *et al.* (2026)

In addition to immersion, CAI/AI-chatbot facilitated counseling uses NLP and machine learning algorithms to simulate therapeutic interactions. According to Rahsepar Meadi *et al.* (2025): Conversational artificial intelligence

(CAI) is emerging as a promising digital technology for mental health care. CAI apps, such as psychotherapeutic chatbots, are available in app stores... Their responses are modeled after therapeutic interventions such as cognitive

behavioral therapy or acceptance and commitment therapy. They continued: Some authors however, think the anonymity could make users feel they avoid stigma, and therefore, some users would prefer opening up to CAI compared to human therapists. In practice, CAI/AI-chatbots create a real-time, conversational-style interaction based on trained models and frequently include safety monitoring. The primary therapeutic models are those of CBT, Motivational Interviewing, and Dialectical Behavior Therapy, focusing on management of symptoms and emotional regulation (Lenartowicz and Alhuwaydi, 2026).

Just-in-time adaptive interventions (JITIs) represent a strongly personalized type, presenting an intervention that occurs when context-based information is received in real-time from sensors or user entry. Henry et al (2025) accurately defined this form of intervention as; The objective of just-in-time adaptive interventions (JITIs) is to employ mobile, digital devices to make individuals available to context-tailored interventions when they are needed most while stating its underlying components were six specific things; (1) distal outcome, (2) proximal outcome, (3) tailoring variable, (4) decision point, (5) decision rule, and (6) intervention options. (Henry et al, 2025). These interventions combine EMA with dynamically driven adaptation to momentary shifts in state and usually include cognitive-behavioral therapeutic components

as well as behavioral activation and stress management principles to address emergent needs (Carpenter *et al*, 2020; Guan *et al*, 2026). All modalities are a powerful example of technology-enhanced counseling showing the capability to scale while maintaining fidelity to empirically proven techniques. Recent systematic reviews show these interventions have the capability to serve as adjunct or replacement services to traditional counseling in increasing accessibility and mitigating workforce shortages (Anser *et al*, 2025; Lchner *et al*, 2025; Torous *et al*, 2025).

EFFECTIVENESS OF TECHNOLOGY-ENHANCED COUNSELING INTERVENTIONS

Technology-enhanced counseling interventions have demonstrated promising clinical outcomes across a range of mental-health conditions, including anxiety, depression, post-traumatic stress disorder (PTSD), stress, and substance-use disorders (Crocamo *et al*, 2025). Systematic reviews and meta-analyses consistently highlight their potential while also noting variability in effect sizes depending on intervention type, population, and implementation context. These approaches offer advantages in patient engagement, adherence, accessibility, and scalability compared with traditional models, though comparative effectiveness versus face-to-face therapy remains an area of ongoing investigation (Crocamo *et al*, 2025).

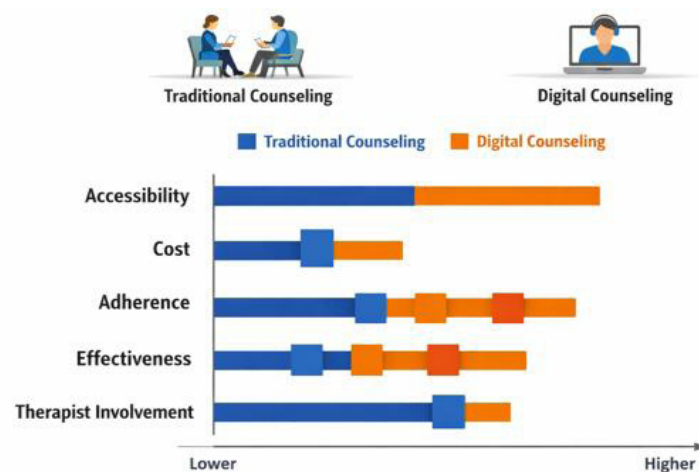


Fig1. Comparative outcomes of traditional vs digital counseling

Source: Crocamo *et al*. (2025)

EFFECTIVENESS IN ANXIETY AND DEPRESSION

Digital interventions have shown consistent benefits for anxiety and depression. The results of Meta-analysis showed that compared with conventional interventions, virtual reality therapy significantly improved the symptoms and level of anxiety in patients with anxiety disorder [SMD

= -0.95, 95%CI (-1.22,-0.69), Z = 7.05, P < 0.00001] (Zeng et al., 2025). For broader digital tools, Chatbots produced statistically significant reductions in depressive (g = 0.31, 95% CI [0.17, 0.46]) and anxiety symptoms (g = 0.28, 95% CI [0.05, 0.51]) compared with controls. Subgroup analyses for depressive symptoms showed larger effects

in clinical and subclinical than in nonclinical samples ($p = 0.001$) (Sohn et al., 2026). In low- and middle-income settings, digital mental health tools also reduce symptoms effectively, supporting their role in addressing global disparities.

TECHNOLOGY-BASED CBT INTERVENTIONS

Internet-delivered and technology-supported cognitive behavioral therapy (CBT) forms a core component of many digital platforms. In our analysis of 18 randomized controlled trials involving 3477 participants, we observed noteworthy improvements in depression ($g = -0.26$, 95 % CI = $-0.34, -0.17$) and anxiety ($g = -0.19$, 95 % CI = $-0.29, -0.09$) symptoms. The most significant benefits were evident after 8 weeks of treatment. However, at the three-month follow-up, no substantial effects were detected for either condition (Zhong et al., 2024). Comparisons with face-to-face CBT indicate comparable short-term outcomes in many cases. The meta-analyses had low heterogeneity and showed that technology-assisted CBT was non-inferior to f2f CBT for anxiety and depression in CYP ($d = 0.06$ and 0.12 respectively) (Bevilacqua et al., 2024). For substance use, for drinking quantity, digital CBT showed a significant pre-post effect (SMCR = 1.21, 95% confidence interval [CI]: 0.38 to 2.04; $p = 0.004$) (Kim et al., 2025).

VR-BASED EXPOSURE THERAPY

Virtual reality (VR) applications excel in exposure-based treatments, particularly for anxiety disorders and PTSD.

The results demonstrated that the analysis were statistically significant [SMD = -0.95 , 95%CI ($-1.22, -0.69$), $Z = 7.05$, $P < 0.00001$] for anxiety symptoms with VR therapy (Zeng et al., 2025). In PTSD contexts, Overall, VRET demonstrated significant and clinically meaningful effects across multiple domains. It reduced phobia symptoms (Hedges' $g = -0.98$; 95% confidence interval (CI) = $-1.37, -0.60$, $P < 0.001$), and mitigated PTSD symptoms (Hedges' $g = -0.51$; 95% CI = $-0.72, -0.30$, $P < 0.001$) (as reported in innovative VRET review, 2026). VR approaches often match or exceed traditional exposure methods in controlled simulations while improving patient acceptability.

AI AND PERSONALIZED COUNSELING SYSTEMS

AI-driven chatbots and personalized systems provide scalable, on-demand support. This meta-analysis highlights the promising role of AI-based chatbot interventions in alleviating depressive and anxiety symptoms among adults (Zhong et al., 2024). Direct evidence shows Both the structured generative AI chatbot and ChatGPT showed a significant reduction in depression scores compared to the control group with effect sizes around $d = -0.44$ to -0.47 (Kuta et al., 2026). These systems integrate real-time personalization, enhancing engagement for conditions like stress and mild-to-moderate depression, though long-term maintenance of gains requires further study.

CHALLENGES AND ETHICAL CONCERNS

While technology-enhanced counseling interventions offer

Table 2. Summary of clinical studies on digital counseling interventions

Technology	Mental Health Condition	Key Findings	Reported Outcomes
VR Therapy	Anxiety Disorders	Significant symptom improvement vs conventional	SMD = -0.95 (Zeng et al., 2025)
AI Chatbots	Depression & Anxiety	Moderate reductions, stronger in clinical samples	$g = 0.31$ depression, $g = 0.28$ anxiety (Sohn et al., 2026)
Technology-assisted CBT	Anxiety & Depression (youth)	Non-inferior to face-to-face	$d = 0.06$ anxiety, $d = 0.12$ depression (Bevilacqua et al., 2024)
Digital CBT	Substance Use (drinking)	Significant pre-post reductions	SMCR = 1.21 quantity (Kim et al., 2025)
AI Chatbots (short-course)	Depression & Anxiety	Improvements peak at 8 weeks	$g = -0.26$ depression, $g = -0.19$ anxiety (Zhong et al., 2024)

Sources: Zhong et al. (2024) Kuta et al. (2026)

substantial promise in addressing global mental-health needs, they also introduce significant challenges and ethical dilemmas that require careful scrutiny. These limitations span privacy risks, equity issues, erosion of human elements in therapy, regulatory gaps, and concerns related to algorithmic integrity (Crocamo et al., 2025). As illustrated in Fig. 2, in-person therapy retains unique

strengths that digital formats struggle to replicate. The infographic highlights how non-verbal cues can be missed in telehealth, how complex or high-risk trauma cases often require direct observation, and how technology barriers such as poor connectivity can disrupt continuity of care. It also notes that certain hands-on techniques like the EMDR are difficult to administer remotely, and that

patient preference may lean toward face-to-face sessions for comfort and safety. These operational limitations underscore the ethical responsibility to ensure that digital

counseling is deployed in contexts where it does not compromise therapeutic quality or patient safety.



Fig2. Limitations of Telehealth in Trauma Therapy

Sources: Crocamo et al. (2025)

DATA PRIVACY AND CONFIDENTIALITY

Data privacy and confidentiality represent core vulnerabilities in digital mental health platforms. The widespread use of AI chatbots and other mental health tools raises significant concerns about data privacy and security. Risks include improper storage. (Rezaei, 2026).

One of the primary concerns surrounding digital mental health tools is the potential for data breaches and the misuse of sensitive personal information. Mental health data is highly sensitive. (Lodha, 2025).

Privacy violations, algorithmic bias, unclear responsibility attribution. (relevant ethical framework paper, 2026). Mental health information is often viewed as particularly stigmatizing, amplifying the consequences of breaches compared to general health data.

ETHICAL ISSUES IN AI-ASSISTED COUNSELING

AI-assisted systems introduce unique ethical complexities around empathy, accountability, and potential harm. We included 101 articles. The following 10 themes were distinguished: (1) safety and harm (discussed in 52/101, 51.5% of articles); the most common topics within this theme were suicidality and crisis management, harmful or wrong suggestions, and the risk of dependency on CAI; (2) explicability, transparency, and trust (3) responsibility and accountability (4) empathy and humanness. (Rahsepar Meadi et al., 2025).

The study identifies 18 key ethical considerations,

including 6 ethical considerations associated with using AI interventions in mental health and wellbeing (privacy and confidentiality, informed consent, bias and fairness, transparency and accountability, autonomy and human agency, and safety and efficacy) (Saeidnia, 2024).

AI chatbots routinely violate core mental health ethics standards. systematically violate ethical standards of practice established by organizations like the American Psychological Association (Brown University study, 2025). These concerns highlight risks of reduced therapeutic empathy and unclear liability when AI provides advice.

ACCESSIBILITY AND DIGITAL LITERACY CHALLENGES

The digital divide exacerbates existing inequalities in mental health care access. The potential benefits of digital mental health tools can be limited by the digital divide the gap between those who have access to and utilize technology and those who do not (Lodha, 2025).

However, there is a growing concern about the digital divide and whether these technologies are reaching the people who need them most (Ozzxc, 2025). Ensuring AI-mental health applications are deployed equitably requires both attention to equal access and protection against bias (American Academy of Arts and Sciences, 2025). Limited digital literacy, device access, and broadband availability particularly affect low-income, rural, and elderly populations, potentially widening treatment gaps rather than closing them.

THERAPIST TRAINING AND CLINICAL OVERSIGHT

Effective integration demands enhanced training and oversight for mental health professionals. The mental health workforce training and education process may need to focus more on computational skills, understanding of how AI works, knowledge around AI bias relevant to mental health, and more (American Academy of Arts and Sciences, 2025). Clinicians themselves may need training

to understand the potential limitations of these digital tools (Psychiatric Times, 2021/updated contexts).

Providers and practices will have to become more knowledgeable about data and cybersecurity. (American Academy of Arts and Sciences, 2025). Insufficient oversight can lead to inappropriate reliance on technology, compromising care quality and professional accountability.

Table 4. Major challenges in technology-enhanced mental health care

Challenge	Description	Clinical Impact	Possible Solutions
Data Privacy & Confidentiality	Risks of breaches and misuse of sensitive mental health data	Erosion of trust, stigma, potential harm from exposure	Strong encryption, HIPAA-compliant practices, clear consent processes
AI Ethical Issues	Lack of empathy, accountability gaps, safety risks	Inappropriate advice, dependency, ethical violations	Human oversight, transparency in algorithms, ethical guidelines
Digital Divide & Accessibility	Unequal access due to technology, literacy, or infrastructure barriers	Widened health disparities, exclusion of vulnerable groups	Subsidized devices, digital literacy programs, offline options
Therapist Training & Oversight	Insufficient skills in technology and bias management	Reduced care quality, over-reliance on flawed tools	Specialized training, continuous professional development, regulatory standards

Sources: American Academy of Arts and Sciences, (2025).

FUTURE DIRECTIONS AND EMERGING INNOVATIONS

Technology enhanced counseling is a rapidly advancing area, influenced by advancements in artificial intelligence, sensors and an integrated care system. It has a future vision of enhancing personalized, real-time monitoring and integration into established healthcare systems. It encourages interdisciplinary teamwork of clinicians, data scientists, engineers, and ethicists to develop more effective and ethical mental health services. AI-driven personalized therapy is leading in this cutting edge technology field. A systematic review looks at AI in mental health in three areas of diagnosis, monitoring, and treatment (Cruz-Gonzalez *et al.*, 2025) and finds that AI-driven tools are very promising in making mental health services more accessible and effective (Ali *et al.*, 2025).

Wearable biosensors and mental health monitoring can be used to monitor a person's physiological indicators of stress, continuously and in an objective way. A systematic review of AI models used to predict mental health conditions and symptoms from wearable biosensors data was conducted (Kargarandehkordi *et al.*, 2025). Compared to traditional means of mental health assessment, there are many benefits of using wearable sensors such as

convenience, lower cost and availability (Gomes *et al.*, 2023). These devices, combined with AI algorithms, offer just-in-time intervention by continuously tracking various factors such as electrodermal activity, sleep patterns, and heart rate variability to help manage and predict levels of depression and anxiety. Large language models in supportive psychotherapy applications are paving the way for advances in conversational care. In the field of psychotherapy, large language models are showing the potential for advances in mental health assessment, diagnosis, and treatment (). LLMs have been utilized for tasks ranging from the prediction and detection of mental illness to treatment support (Jin *et al.*, 2025). An example of future applications could be the development of an end-to-end conversational platform to bridge evaluation to individualized treatment. These LLMs could simulate therapist conversations, offer individualized exercises, and be used as scalability supplements with the integration of humans.

The integration of digital therapeutics in health systems and the emergence of hybrid counseling practices are examples of system-level advances. Hybrid counseling uses face-to-face or telehealth visits in conjunction with digital platforms (Chen *et al.*, 2024). Integration of both in-person therapy and digital tools is an emerging model

that aims to be a sustainable model. This can improve accessibility and access to quality mental health services and reduce waiting times (NextGen Invent, 2025 context). Combination hybrid models with both telehealth and async

digital health reflect current research and offer future potential (Torous *et al.*, 2025). These approaches make the integration between digital self-care and professional mental health services easier.

Table3. *Emerging technologies and future mental health applications*

Emerging Technology	Potential Application	Expected Benefits
AI-Driven Personalized Therapy	Adaptive intervention algorithms based on user data	Higher engagement, tailored treatment plans, improved outcomes
Wearable Biosensors	Real-time physiological and emotional state monitoring	Early detection of crises, objective progress tracking, proactive support
Large Language Models (LLMs)	Conversational psychotherapy support and content generation	24/7 accessibility, scalable adjunct therapy, personalized exercises
Digital Therapeutics	Seamless embedding into EHRs and clinical workflows	Better care coordination, reduced administrative burden, system-level scalability
Integration Hybrid Counseling Models	Blended in-person, telehealth, and digital delivery	Enhanced flexibility, continuity of care, optimized clinician time

Sources: Jin *et al.* (2025); Torous *et al.* (2025).

CONCLUSION

Technology-enhanced counseling interventions have proven to be a transformative approach in addressing the global mental health crisis. These digital tools, spanning teletherapy, mobile applications, virtual reality, artificial intelligence chatbots, and just-in-time adaptive interventions, demonstrate meaningful clinical effectiveness for anxiety, depression, PTSD, stress-related disorders, and substance use challenges. They offer strong potential to reduce treatment gaps, improve accessibility, and deliver scalable support, especially in underserved and low-resource settings, while maintaining outcomes often comparable to traditional therapy.

Despite these advances, significant challenges remain. Issues surrounding data privacy, algorithmic bias, the digital divide, reduced human empathy, and the need for proper therapist training highlight the importance of responsible implementation. Ethical considerations must guide every stage of development and deployment to protect vulnerable users and preserve the core human elements of counseling.

The future of mental health care lies in thoughtfully designed hybrid models that blend technological innovation with professional human guidance. Emerging developments in AI personalization, wearable biosensors, large language models, and integrated digital therapeutics promise more proactive, precise, and inclusive systems. Achieving this vision will require strong interdisciplinary collaboration among clinicians, technologists, ethicists, and policymakers.

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Conflict of Interest

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