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**DIGITAL TRANSFORMATION,  
ARTIFICIAL INTELLIGENCE AND MENTAL HEALTH:  
critical issues and preconditions for successful  
outcomes – a strategic review**

Dissertation

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## Abstract

This strategic review explores the complex and multifaceted aspects of the digital transformation in mental health care, including the integration of Artificial Intelligence (AI)-based tools within psychiatric practice. There is broad agreement among key international organizations and academic experts that this transformation has the potential to significantly improve access to mental health services. Additionally, AI can enhance diagnostic and therapeutic processes, offering many positive contributions. However, there are also concerns regarding potential drawbacks, including ethical, legal, clinical, and socio-cultural challenges. These issues can only be effectively addressed through the development of appropriate policies, regulatory frameworks, and robust evaluation procedures. For countries, the critical question is whether they can mobilize the necessary political will and resources to implement such innovations in a thorough and systematic manner.

## Introduction – scope and purpose of the dissertation

Digital transformation (DT) involves the use of digital technologies to create new processes, replace existing ones, or enhance current systems across various aspects of human activity, including public health and healthcare. In recent years, Artificial Intelligence (AI) has significantly transformed how health and related disciplines address key areas of health development and service delivery. This dissertation aims to explore and discuss the multiple dimensions (political, governance, scientific, technical, ethical, and legal) at the intersection of digital transformation and AI in promoting mental health and well-being, as well as in the prevention and treatment of mental health disorders.

Mental health represents a global challenge. 13.9% of the world's population experienced mental health disorders in 2021 with staggering impacts on the wellbeing of affected people, their families and societies as a whole. The global economic value associated with the burden of mental disorders was estimated at about USD 5 trillion in 2022. In line with WHO guidance policies (World Health Organization, 2021), strategies and plans addressing mental health disorders need to be value-based, comprehensive, responsive, personalized, continuous and accessible to all. Recognizing the critical importance of mental health, particularly in the wake of the unprecedented crises of recent years, the European Union launched a new comprehensive mental health approach in 2023 (A comprehensive approach to mental health - European Commission, n.d.). With a budget of €1.23 billion, the initiative includes a broad range of flagship projects and emphasizes the substantial cost of inaction, estimated at €600 billion annually.

The dissertation will aim at addressing the following questions: What is the emerging landscape and potential of digital transformation and AI in mental health promotion and care today? What are the critical issues could hinder, distort or undermine their widespread integration into daily life? Applying a 21<sup>st</sup> century lens (THE 17 GOALS | Sustainable Development, n.d.) on values and principles, what should be the recommended preconditions for effectively leveraging digital transformation and AI in practice? and to what extent are these preconditions

reflected in the relevant policies and practices in Greece, considering its unique social, cultural, economic, and geographical characteristics?

### **Mental health in the 21<sup>st</sup> century and the post pandemic era**

Mental health has become one of the most pressing global issues of the 21<sup>st</sup> century, with the COVID-19 pandemic acting as a significant catalyst in amplifying pre-existing challenges. The mental health of individuals and communities worldwide has been significantly affected by the pandemic, with rising cases of anxiety, depression, and post-traumatic stress disorders (PTSD).

### **Key Issues in Mental Health in the 21st Century**

Global Mental Health Crisis: The prevalence of mental health conditions has surged in recent decades. Anxiety disorders, depression, and other mood disorders are now the leading causes of disability worldwide. According to the World Health Organization (WHO), one in four people globally will be affected by mental or neurological disorders at some point in their lives. This increase in mental health problems can be attributed to numerous factors, including societal changes, rapid urbanization, economic crises, climate change, and the widespread use of digital technology, which can exacerbate issues such as social isolation, cyberbullying, and addiction (Mental health, n.d.).

1. Impact of the COVID-19 Pandemic (World Health Organization, 2022): The COVID-19 pandemic has further exacerbated the mental health crisis, highlighting the vulnerability of populations under stress. Social isolation, fear of illness, loss of livelihoods, and grief from losing loved ones have led to increased rates of mental health disorders globally. In addition, the closure of schools, workplaces, and community spaces has disrupted social support systems that individuals depend on for emotional well-being. In many parts of the world, mental health services

were disrupted, leaving individuals without necessary support during a time of acute distress.

2. Stigma and Lack of Awareness: Mental health stigma continues to be a pervasive issue worldwide, hindering people from seeking help. Many individuals in both developed and developing countries fear discrimination and marginalization, which can prevent them from accessing mental health services. Furthermore, there is often a lack of understanding about mental health issues, both in terms of the general population and even among some healthcare providers. This gap in knowledge impedes early diagnosis and intervention, leading to worsening symptoms and, in some cases, permanent disability.
3. Mental Health in Vulnerable Populations: Certain groups are particularly vulnerable to mental health problems. These include people who are homeless, refugees, migrants, individuals living in poverty, children, the elderly, and those with pre-existing physical health conditions. Mental health issues in these populations are often compounded by a lack of access to healthcare, social isolation, discrimination, and exposure to trauma or violence. For instance, refugees and displaced persons frequently experience PTSD and anxiety as a result of the traumatic events they have endured, including war, persecution, and separation from family members.

### **Determinants of Mental Health**

Mental health is shaped by a complex interplay of biological, psychological, and social determinants. Understanding these factors is crucial for developing effective strategies to address mental health issues in the 21<sup>st</sup> century (Patel et al., 2018).

1. Biological Factors: Genetics and neurobiology play significant roles in determining an individual's vulnerability to mental health conditions. For example, individuals with a family history of mental illnesses such as schizophrenia or bipolar disorder may be at a higher risk. Additionally,

changes in brain chemistry and structure can lead to conditions like depression and anxiety.

2. Psychological Factors: Psychological well-being is influenced by an individual's coping mechanisms, personality traits, and life experiences. Traumatic events, abuse, neglect, and stressors such as job loss or relationship breakdowns can trigger mental health disorders. Resilience, however, can buffer the effects of these stressors, and individuals with strong coping skills or social support are better able to manage adversity.
3. Social Determinants: Social factors, including socioeconomic status, education, employment, and social connections, play a vital role in shaping mental health. People living in poverty or facing economic instability often experience higher levels of stress, which can lead to mental health issues. Social support networks, including family, friends, and community, provide a critical buffer against mental health problems. Isolation, on the other hand, can increase the risk of developing conditions such as depression and anxiety.
4. Cultural and Environmental Factors: The cultural context and environment in which individuals live also influence their mental health. In some societies, mental health issues may be less acknowledged or even stigmatized, preventing individuals from seeking care. Additionally, environmental stressors, such as living in overcrowded or unsafe conditions, can contribute to mental health deterioration. In recent years eco-anxiety due to the climate crisis has become increasingly prevalent amongst the young.

### **Needs of Vulnerable Populations in Remote Areas and Poor Countries**

Vulnerable individuals, especially those living in remote areas or in poverty-stricken countries, face significant barriers to mental health care. Addressing their needs requires a multi-faceted approach that considers the unique challenges they face.

1. Limited Access to Mental Health Services: In many remote areas and poor countries, mental health services are scarce, and there is often a lack of trained mental health professionals. Rural areas, in particular, experience shortages of psychiatrists, psychologists, and social workers. This lack of access means that people suffering from mental health conditions often go untreated, exacerbating their symptoms. In some cases, healthcare providers in these areas may not have the proper training to recognize or address mental health issues.
2. Economic Barriers: The cost of mental health care is another significant barrier for individuals in low-income settings. Even when mental health services are available, they may not be affordable, and many individuals living in poverty cannot bear the costs of private therapy or medications. Public mental health systems in many developing countries are underfunded, and resources are often directed toward physical health services, leaving mental health care as a lower priority.
3. Cultural and Social Barriers: In many remote or low-income areas, mental health issues are often misunderstood or stigmatized. Cultural beliefs and taboos surrounding mental illness can prevent individuals from seeking help. Moreover, there may be a lack of awareness about the nature of mental health disorders and available treatment options. This makes education and awareness campaigns crucial for overcoming the barriers to mental health care.
4. Trauma and Displacement: Vulnerable populations in remote areas and poor countries are often disproportionately affected by trauma. War, natural disasters, displacement, and violence can lead to long-lasting psychological effects, including PTSD, anxiety, and depression. Refugees and displaced persons, in particular, face the added burden of cultural adaptation and the trauma of leaving behind their homes and families. Addressing the mental health needs of these groups requires trauma-informed care and services tailored to their specific experiences.
5. Social Isolation and Loneliness: In rural or impoverished settings, people may experience social isolation due to limited social networks and

geographic barriers. The elderly, in particular, may experience loneliness, which is a significant risk factor for mental health issues such as depression. Social isolation is compounded by poor infrastructure, making it difficult for individuals to connect with others or access support services.

Mental health in the 21<sup>st</sup> century remains a critical issue, especially in the aftermath of the COVID-19 pandemic, which has further underscored the need for a more robust and accessible mental health infrastructure. Determinants such as biological, psychological, and social factors contribute to the development of mental health conditions, and vulnerable populations, particularly those in remote areas and low-income countries, face significant challenges in accessing care. Addressing these challenges requires a comprehensive approach, including the expansion of mental health services, increasing awareness and education, and tackling the social and economic barriers that prevent individuals from seeking help. Only by addressing these issues can we ensure that mental health becomes a global priority, leading to better outcomes for individuals and communities worldwide.

### **Framing the issue**

Thinking about or being exposed to the different digital and AI applications in mental health can evoke a range of conflicting feelings of awe, amazement, confusion and concern. While these feelings are not unique to this particular domain, they hold an added significance due to the stigma and challenges mental health faces in today's society. There is a growing need for mental health support and services in the light of rising rates especially of depression, anxiety and stress. At first glance, the transformation of the mental health care landscape through digital technologies and AI appears to be a huge blessing. However, as is the case in many other fields, the rapid pace of change not only solves existing problems but also introduces new dilemmas, often leaving enthusiastic users unprepared for the consequences of these digital applications. This dissertation aims to systematically explore and understand the various facets of digital and AI applications in mental health through the

lens of values and principles, as defined by the World Health Organization and other relevant agencies in the field. For this purpose, the following issues will be addressed:

- Identify, describe and categorize the key technologies and relevant services being introduced in this in mental health care within the broader context of the digital transformation of health services (Chapter 1).
- Contextualize how these technologies and services are perceived and addressed by the international community (Chapter 2).
- Explore and analyse the advantages, concerns and the risks associated with digital technologies and AI in mental health care (chapter 3).
- Review and synthesize the policies, strategies and actions proposed to address the digital transformation of mental health care (chapter 4).
- Identify critical preconditions for successful implementation (chapter 5).

Additionally, the dissertation will examine the case of Greece focusing on existing policies, plans and services provided (chapter 6).

### **Methodology and Research Hypothesis**

This is first and foremost a strategic review designed to synthesize existing literature, with a specific focus on conceptualizing and contextualizing the features and implications of introducing digital and AI-based technologies in mental health care. It is not intended to be a systematic review or a met-analysis; rather it is a conceptual thematic analysis. The review follows a logical and analytical sequence, beginning with the identification of key facts about the diverse benefits and challenges of digital and AI applications in mental health. It then explores how key policy and academic actors have shaped the path for their fair and practical implementation. For this purpose, a narrative review approach was adopted, focusing on a curated selection of literature. This study utilized four sources of information: grey literature (literature produced by organizations outside academic and commercial channels) retrieved via Google; academic journal articles accessed through Google Scholar; official websites of organizations such as the WHO, UNICEF, the Council of Europe,

the European Union, and the European and American Psychiatric Associations; and the Greek Ministry of Health website. The following key terms were systematically used in various combinations across all searches: “mental health”, “digital”, “digital transformation”, “AI applications”, “AI tools”, “review article”, “strategy”, “policy”. The search of academic journals covered the period from 2015 to 2024’. For international bodies, the focus was on the most recent relevant information, with the exception of materials related to charters of human rights or equivalent documents.

The strategic focus of the analysis in the present study recognises the socio-political context within which the digital transformation of health care and specifically of mental health care must take place. Digital and AI-based applications in mental health care should not be viewed merely as innovations in clinical practice; rather, they represent interventions that fundamentally transform how society understands and addresses mental health. This shift inevitably raises a range of political, legal and ethical questions. AI-based applications were used to verify and enhance the accuracy of the English language in the study.

### **Scientific Research question or Hypothesis**

“The positive impacts of the intersection of the digital transformation and AI with mental health appear to significantly outweigh its negative effects which can be effectively limited through value- driven policies, regulatory and legal frameworks.”

## Chapter 1. The mental health digital landscape

AI has brought many possibilities to mental health care (Graham et al., 2019): It enhances detection and diagnosis of mental illnesses; it offers the possibility to analyse large and diverse data sources for deeper insights; it has widened understanding of mental illness biological mechanisms; it can provide remote therapy and intelligent self-diagnostics for mental illness severity; it can identify risk and protective factors; it can follow up and monitor treatment progress and medication compliance; and it can significantly contribute to alleviating the time constraints faced by psychiatrists and in designing personalised treatments.

### **Categories of Digital and AI-Based Innovations in Mental Health Care:**

#### **Functions and Applications**

Digital and AI-based innovations are increasingly shaping the landscape of mental health care by introducing various tools and technologies designed to support diagnosis, treatment, and overall well-being.

One major category is Telehealth (Hermes et al., 2020), and Virtual Care Platforms (Hagi et al., 2023), which enable remote consultations between patients and mental health professionals through telepsychiatry, including video calls, phone calls, and text messaging. These platforms also provide access to online therapy, offering interventions like Cognitive Behavioral Therapy (CBT), Dialectical Behavior Therapy (DBT), and other therapeutic methods, either in live or on-demand formats. Additionally, virtual support groups create online spaces for peer-to-peer support, often serving patients with similar conditions such as depression, anxiety, or substance abuse.

AI-assisted diagnosis and screening (Olawade et al., 2024) represent another significant advancement, with AI tools trained to analyse symptoms, medical records, and behavioral data to diagnose mental health conditions like depression (Yousufi et al., 2024), anxiety, and schizophrenia. These tools include sentiment and speech analysis, where AI evaluates speech patterns and sentiment to detect early

signs of mental health issues. Facial recognition for emotion detection is also employed to interpret facial expressions and identify emotions such as sadness or anger, contributing to the early identification of mood disorders.

Digital therapeutics and AI-driven interventions (Carl et al., 2022) are another area of growth. AI-powered CBT apps, such as Woebot and Youper, deliver personalized mental health interventions using cognitive behavioral techniques. Digital therapeutics (DTx) are clinically validated software solutions that provide evidence-based therapeutic interventions, often for conditions like anxiety, depression, and PTSD. Mood and behaviour tracking apps also help individuals monitor their emotional well-being, offering insights into mental health trends through AI-powered analysis of personal data.

The use of chatbots and virtual mental health assistants (Anguera et al., 2017) has also gained popularity. These AI-powered conversational agents (Siddals et al., 2024), like Woebot, Tess, and Wysa, offer emotional support, provide CBT techniques, deliver psychoeducation, and engage in real-time interactions with users. Additionally, virtual assistants are designed to support cognitive and emotional needs, offering reminders, coping strategies, and emotional responses to assist patients in managing mental health challenges.

Self-help and psychoeducation tools (Leech et al., 2021) are widely available through mobile mental health apps, which provide resources like mood tracking, meditation, relaxation techniques, and self-help exercises. Psychoeducation platforms further support mental well-being by offering educational content on mental health conditions, treatment options, and wellness practices. Digital suicide prevention apps (Torok et al., 2020), for example, provide psychological self-help tools aimed at individuals at risk of suicide who may not engage with traditional health services.

AI is also playing a role in personalized treatment and decision support (Lee et al., 2021) by analysing patient data to recommend tailored treatment plans. AI-driven systems assist mental health professionals with clinical decision support, providing data-based recommendations for diagnosis, treatment options, and patient monitoring.

Virtual reality (VR) and augmented reality (AR) applications are making strides (Valmaggia et al., 2016) in therapeutic environments. VR-based therapies expose patients to controlled virtual environments to treat conditions like anxiety disorders, PTSD, and phobias. AR tools are being used in cognitive rehabilitation and stress management, allowing patients to interact with virtual environments to address therapeutic needs.

Data analytics and predictive models (Katarya and Maan, 2020) further enhance mental health care by predicting the onset of mental health conditions through machine learning algorithms that analyze historical data, social media activity, and behavioral patterns. Big data is also being utilized to identify trends and correlations, informing mental health research and intervention strategies.

Wearable devices and biofeedback technologies (Hunkin et al., 2020) offer valuable tools for managing mental health. Wearable devices (Masri et al., 2024) track physiological data, such as heart rate, sleep patterns, and physical activity, providing real-time feedback to help manage stress, anxiety, and depression. Biofeedback devices, on the other hand, offer users real-time data on physiological responses, such as heart rate variability, enabling them to control stress levels and improve emotional regulation.

Finally, online assessment and monitoring tools (Ebert et al., 2015) contribute to the ongoing evaluation of mental health. Digital assessments allow users to self-assess their mental health conditions, providing diagnostic feedback or helping clinicians monitor patient progress remotely. Real-time monitoring systems utilize AI to continuously track changes in behaviour, mood, or activity levels, alerting clinicians to potential changes in mental health status and enabling timely intervention (Okoro et al., 2024).

This typology consisting of ten main categories (Table 1), classifies the diverse digital and AI technologies that are currently being utilized or investigated in mental health care. Each category fulfils a specific function, ranging from enhancing diagnosis and treatment to increasing accessibility and fostering patient engagement. These technologies signify a transformative shift in the mental health sector, though they also introduce new challenges concerning privacy, ethical and legal considerations, and integration into existing care frameworks. Ethical concerns

include the potential of AI overriding clinical decisions or making treatment decisions without human oversight.

**Table 1.** Main categories of Digital and AI-Based Innovations in Mental Health Care

Telehealth and virtual care platforms
AI-assisted diagnosis and screening
Digital therapeutics and AI-driven interventions
Chatbots and virtual mental health assistants
Self-help and psychoeducation tools
Personalized treatment and decision support
Virtual reality (VR) and augmented reality
Data analytics and predictive models
Wearable devices and biofeedback technologies
Online assessment and monitoring tools

The digitalization of mental health care offers the possibility of Hybrid Mental Health Care (Chen et al., 2024) (combining of synchronous in-person or telehealth contact with the system with asynchronous digital tools such as smartphone applications (e.g. mood tracking psychoeducation), wearable devices, collecting real data outside sessions (process mining, time series analytics), virtual reality (e.g. exposure therapy, empathy machines), robotics and sensing (facial expression analysis, affective computing).

Teletherapy platforms allow people to connect with licensed therapists via video, chat or phone. It should be noted that online platforms can be used privately, reducing the stigma associated with seeking help and they can also connect people with others facing similar challenges. They also offer possibilities for digital advocacy (Okoro et al., 2024) and peer support.

AI-based Chatbots provide conversational support and early intervention for those feeling stressed and anxious. Most importantly many digital tools are free or cheaper than personal therapy increasing access to those in need. Digital services make a significant difference in crises situations allowing the possibility to get immediate support.

A great advantage of these technologies is the fact that they can bridge geographical gaps, making mental health support easier to reach to poor and under-served parts of the world.

## Chapter 2. International perspectives

There are several reasons for which it is important to consider at the start the international dimensions of the use of digital technologies and AI in mental health care. Mental health is a global issue in an increasingly interconnected world. The study explores the international dimensions of digital mental health by examining the views and recommendations of key international bodies alongside insights from the literature on the use of such technologies across different regions of the world:

- The views and recommendations of the WHO, the world's leading authority on health.
- The views and recommendations of UNICEF, the leading UN agency for the health of children and adolescents, for whom mental health issues are of critical importance.
- The views and recommendations of two of the world's most authoritative scientific bodies in mental health: the European and American Psychiatric Associations.
- The views and recommendations of the Council of Europe, which systematically addresses the human rights, legal, and ethical standards of health-related applications and interventions.
- The views, recommendations and regulatory decisions of the European Union with regard to the mental health and digital AI-driven care.
- Accounts of the use of digital and AI uses in mental health across different regions.

The above-mentioned bodies have issued universal standards, comprehensive guidelines and recommendations for the implementation and use of digital and AI tools and services in mental health care. The underlying assumption in the following analysis is that digital transformation has the potential to significantly improve global access to high-quality mental health services and platforms, as long as these services are culturally sensitive, well-regulated, and uphold rigorous ethical standards.

All WHO strategies and plans are grounded in the human right to health and well-being (World Health Organization, 1948), the principles of equity, health for all and universal coverage, and the 17 Sustainable Development Goals (SDGs) set by the United Nations (THE 17 GOALS | Sustainable Development n.d.). Currently WHO is implementing the Comprehensive Mental Health Action Plan 2013-2030 (World Health Organization, 2021) and the Global Strategy on Digital Health 2020-2025 (World Health Organization, 2021).

The Mental Health Action Plan puts emphasis on a rights-based approach promoting human rights and addressing the stigma and discrimination often associated with mental health conditions and fostering mental wellbeing and resilience. The Plan puts forward four major objectives: 1) more effective leadership and governance for mental health; 2) the provision of comprehensive, integrated mental health and social care services in community-based settings; 3) the implementation of strategies for promotion and prevention; and 4) strengthened information systems, evidence and research. The WHO Comprehensive Mental Health Action Plan 2013-2030 acknowledges the growing importance of digital tools and AI in advancing mental health care, particularly in addressing gaps in mental health services, improving access, and enhancing the quality of care. The Plan provides recommendations for integrating innovative technologies such as digital tools and AI to improve mental health services. Digital tools are regarded as essential for expanding mental health services especially in underserved areas and in providing psycho-education and cognitive-behavioral therapy interventions. The Plan also recognizes the potential of AI in diagnosing mental health conditions and predicting outcomes while emphasizing the importance of data privacy and the need to uphold high ethical standards.

The WHO's 2020-2025 Global Strategy on Digital Health acknowledges the transformative potential of digitalizing healthcare. This strategy aims to leverage digital health tools, including AI, to enhance mental health care worldwide, with a particular focus on supporting vulnerable populations. It outlines a vision for the integration of digital technologies into health systems world-wide. The strategy aims to take full advantage of the potential of digital technologies to advance universal health coverage by improving access, quality and efficiency of health care with

special emphasis on access to all including the vulnerable and underserved populations. It also underscores the importance of global cooperation between governments the private sector and civil society to maximize the impact of digital health (e-health) and calls for robust mechanisms to safeguard personal data.

Both the European (European Psychiatric Association – EPA, 2024) (EPA) and American Psychiatric Associations (Home, n.d.) have actively engaged in the digitalization of mental health care, providing guidelines and recommendations to enhance the integration of digital technologies, including artificial intelligence (AI), into psychiatric practice. The American Psychiatric Association (APA) has played a particularly active role, offering various frameworks and recommendations to guide the use of digital tools in mental health care.

Recognizing the increasing significance of digital tools in modern psychiatry, the EPA established a Digital Section within the Association. This section, among other initiatives, develops practical guidance on integrating digital and AI methods into psychiatry, as well as creating toolkits with educational materials for practitioners on various applications, such as telepsychiatry. In 2023 it published comprehensive guidance on the introduction of digital mental health interventions into clinical practice (Kalman et al., 2024). APA has issued encouraging position statements on various applications including telepsychiatry and digital therapeutics with guidance on how they should be used effectively and ethically. It has given special attention to the ethical implications of AI in mental health (Moran, 2023) (AI in psychiatry will help, but is not a substitute for physicians, 2024) and established principles for its use driven by the principles of transparency, fairness, accountability, privacy, security, autonomy and informed consent.

UNICEF's Mental Health Innovation Portfolio (Mental Health Innovation Portfolio | UNICEF Office of Innovation, n.d.) supports innovative digital health solutions to improve mental health for children and adolescents. It focuses on scaling digital interventions through collaborations with governments, tech companies, and other international organizations. UNICEF argues that “the mental health crisis is complex and interconnected, demanding a collaborative approach rooted in systemic innovation” and that this challenge also requires strategically redesigning systems and technologies.

Amongst the innovations it promotes are: TeleMentalHealth which leverages social media platforms to raise awareness and improve access to mental and psychosocial health services for children and adolescents. Using a chatbot-driven digital platform, it offers information, connects users with mental health professionals, and provides emergency support, especially in areas with limited connectivity; Tele-Children Protection Unit which helps improve access to highly responsive multi-disciplinary support to victims of abuse; TeleTech4 utilizes a variety of technologies, including video games, chatbots, and AI, to offer mental health and psychosocial support in the Latin America and Caribbean region. Additionally, the "Big Data for Mental Health" initiative employs big data to provide policymakers with valuable insights, aiding in the development of effective policies and interventions. The Portfolio continues to evolve, exploring cutting-edge innovations aligned with emerging trends. It includes virtual reality-based care, therapeutic computer games, data-driven research, remote training to address workforce shortages, advanced chatbot-powered response systems, and self-care apps for youth mental health.

The Council of Europe (The Council of Europe: guardian of Human Rights, Democracy and the Rule of Law for 700 million citizens - Portal - [www.coe.int](http://www.coe.int), n.d.) does not have direct competence in health care policy, as its primary focus is on human rights, democracy, and the rule of law across its member states. However, it does address health-related issues within the broader context of human rights, public health, and social protection. In this context, it has taken steps to address issues related to the use of digital technologies and AI in healthcare, including mental health care, through a wide range of Resolutions and policy documents with a focus on the following (European Court of Human Rights and Council of Europe, 1950): the protection of human rights in the digital age; the right to privacy to protect sensitive personal data; the need to be non-discriminatory catering to diverse populations and ensuring the vulnerable and marginalised groups are not excluded; and the right to informed consent, autonomy and dignity.

Most importantly, the Council also emphasizes the need to mitigate risks associated with algorithmic bias, lack of transparency and accountability, and the potential harm caused by poorly designed or unregulated AI systems in mental health care. Crucially the Council has advocated for robust data protection

mechanisms, the importance of not replacing human professionals in mental health care, the need to involve diverse perspectives in the development of algorithms, to take special care for children and adolescents and to be inclusive of older people and individuals with disabilities, and last but not least the need for international collaboration with UN agencies and the EU.

The EU adopts a balanced approach to the use of AI and digital technologies in mental health, striving to promote innovation while addressing ethical, regulatory, and privacy issues. Through frameworks such as the GDPR (GDPR Archives, n.d.), the AI Act and the 2024 Regulation (Regulation - EU - 2024/1689 - EN - EUR-Lex, n.d.), and the European Health Data Space (EHDS) (European Health Data Space - European Commission, 2024), the EU aims to ensure that AI and digital tools in mental health care are deployed responsibly, transparently, and equitably, benefiting individuals and healthcare systems throughout the region.

Specific issues covered by the various relevant EU guidelines include ensuring that digital health tools including AI are accessible and efficient while securing data privacy and security for patients; that adhere to principles of accountability and user consent; that preserve the right to explanation of automated decision-making processes; that strong safeguards are in place to prevent data breaches; that they must undergo rigorous testing to meet strict standards of safety given that AI tools used in mental health care are classified as “high-risk”; that digital mental health tools are interoperable across EU countries; and that funding through Horizon programme, is available for developing and testing AI-based mental health interventions.

Furthermore, the EU Mental Health Comprehensive Approach (A comprehensive approach to mental health - European Commission, n.d.) highlights the transformative potential of digital health and AI in improving mental health care provided relevant operational and ethical standards are upheld. The EU advocates for scaling digital mental health solutions to ensure equitable access to care for all individuals in need across member states. Lastly the EU also supports digital literacy initiatives particularly in underprivileged communities.

The global adoption of digital mental health solutions and innovations in this domain varies widely in different parts of the world (Volpe et al., 2024). Indeed,

there is considerable diversity and inequality between high-, low- and middle-income countries, but also among nations with advanced health systems. Challenges faced globally include limited access to technology and internet connectivity, fragmentation in resource allocation, need for professional training and capacity to use AI and digital technologies, lack of regulatory and accountability frameworks and considerable cultural barriers. For poorer regions like Sub-Saharan Africa and Southeast Asia, where access to traditional mental health services is limited, digital mental health tools are crucial.

The global perspective (World Health Organization, 2021) emphasizes both the opportunities and challenges associated with the digitalization of mental health care. Digital health and AI can improve global access to mental health care, supported by key international bodies. WHO advocates for a rights-based approach, promoting digital tools and AI in underserved areas. UNICEF focuses on innovative digital solutions for children and adolescents, while the EU ensures ethical, privacy-respecting frameworks for digital health tools. The APA and EPA provide guidelines for integrating AI in psychiatry, emphasizing ethics and practical use. The Council of Europe addresses human rights, data protection, and algorithmic fairness. Despite progress, challenges like limited access and regulatory gaps remain, underscoring the need for robust governance and international collaboration.

### **Chapter 3. Emerging issues that matter – threats and opportunities**

The post-Covid-19 pandemic landscape in global mental health has gained significant prominence, partly due to the pandemic and the financial crises exposing a wide range of mental health conditions, and also because of the rapid advancement of digital and AI-driven applications in mental health care.

The literature review highlights the substantial contribution of digital mental health care to improved health outcomes, though it also presents several important caveats.

These can be categorised into four key areas:

1. Clinically effective diagnostic and therapeutic applications, though further evaluation is required.
2. Increased access to mental health care, particularly for underserved and vulnerable populations, with a need to address the potential risk of exacerbating inequalities.
3. Notable ethical and legal concerns related to human rights, privacy, autonomy, and accountability.
4. The necessity for universal regulatory mechanisms that ensure transparency, safety, and user consent, applicable across high, medium, and low-income countries.

Issues of increased interest in the literature include, how digital technologies can enhance but not replace existing mental health services (Bond et al., 2023); the need for digital literacy and participative governance (Zidaru et al., 2021); the potential to reaching out to marginalised communities (online communities) (Robinson et al., 2024); and the huge ethical and regulatory challenges (Ogugua et al., 2024) of AI in the digital transformation of mental health services including issues of human rights (Galatzer-Levy et al., 2023), stigma, cyberbullying, digital divide, distorted and biased algorithms (Holzmeyer, 2021).

Based on the reviewed scientific literature and the information contained in strategies and plans of the international agencies examined in the present study, the

following SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) of the digitalization of mental health, including the use of AI, is presented:

### **Strengths**

- Increased access to mental health services.
- Timely assessments, facilitating prompt interventions and support.
- Availability of personalised treatments and tailored-made support.
- Potential to reach and serve effectively large populations at lower operational costs allowing for cost-effective care delivery.
- Ability to provide access to help in a discreet and private manner, reducing the risk of stigmatization

### **Weaknesses**

- Concerns about personal data privacy and the risk of breaches.
- Risk of biases in AI algorithms from data they have been trained on may lead to discrimination.
- Lack of regulatory oversight nationally and internationally for all relevant applications.
- Risk of depersonalizing mental health care due to a lack of essential human-to-human interaction.
- Further widening of the digital divide due to lack of digital literacy and unequal access to digital mental health care services.

### **Opportunities**

- Mental Health Care for All – potential to reach out to the poor, the displaced, the vulnerable and those living in conflict zones.
- Existing digital and AI-based tools can be made available to underserved populations including children, older people and the socially excluded.
- Digitalization of mental health care now is increasingly integrated into modern health systems making mental health care more comprehensive, continuous, and efficient.

- Tremendous potential for new diagnostic methods and treatments that could revolutionize our understanding of and approach to mental illness.
- AI and digital health tools provide opportunities to develop the skills of multi-disciplinary health professionals to manage mental health conditions.
- Increased use of digital platforms can contribute in improving mental health awareness.
- International collaboration can be strengthened by sharing best practices, data and innovations.

### **Threats**

- Complex ethical and legal challenges may emerge from AI applications that could override clinician decisions or lead to erroneous diagnoses, posing risks to both individuals and the health system.
- The rapid pace of new applications and developments in this field makes it challenging for regulators to update oversight mechanisms timely and effectively.
- Poorly evaluated applications may compromise quality and efficacy standards of mental health care.
- Overreliance on digital tools and AI could undermine the human face-to-face essential element in dealing with mental health conditions
- Public trust in digital tools and AI applications may be influenced by fears of safety, transparency and fake information.
- Risk of increasing health inequalities between and within countries if digital transformation policies and strategies do not integrate 'mental health for all' targets.

In conclusion, the digitalization of mental health care, including the integration of AI, holds transformative potential to enhance accessibility, improve efficiency, and deliver personalized care. However, significant challenges remain regarding privacy, quality assurance, and the establishment of effective regulatory frameworks. Striking the right balance between technological progress and the protection of ethical

standards is essential to ensuring that digital mental health solutions deliver maximum benefits while minimizing risks. Additionally, addressing equity concerns and ensuring universal access to digital health tools are critical factors for creating a successful and inclusive digital mental health ecosystem.

#### **Chapter 4. Typology of country level policy and strategic recommendations**

Integrating digital technologies and AI-based applications into the mental health care system requires the development of policies, strategies, and plans to establish the necessary supportive operational environment for their effective implementation. There is no one-size-fits-all approach or single pathway to achieving this. Authoritative international bodies consistently advocate for adopting holistic and systematic approaches that balance openness to innovation with enforceable standards to ensure quality and fairness in mental health care delivery.

Countries may choose a general health system framework that defines key principles, such as health and equity for all, which serves as the foundation for sector-specific policies and strategies. Digital technologies and AI-based applications in mental health care may be addressed in standalone policies or included in broader health system documents. In this chapter, a presentation, categorization, and synthesis of policy and strategy recommendations from the WHO, UNICEF, and the scientific literature will be provided.

The World Health Organization (WHO) has provided comprehensive guidance on the digitalization of mental health and the use of artificial intelligence (AI) in this field (Table 2).

**Table 2. WHO policy recommendations**

Digital Interventions for Health System Strengthening (World Health Organization, 2019)	WHO recommends the integration of digital health technologies to enhance health systems, including mental health services. This involves utilizing mobile phones, tablets, and computers to improve health outcomes.
Artificial Intelligence in Mental Health (Artificial intelligence in mental health research: new WHO study on applications and challenges, n.d.)	WHO acknowledges the potential of AI in mental health services and research but highlights the need for careful evaluation and regulation to ensure effectiveness and safety.
Ethical and Governance Considerations for AI in Health (WHO releases AI ethics and governance guidance for large multi-modal models, n.d.)	WHO has released guidance on the ethics and governance of large multi-modal AI models in healthcare, emphasizing the importance of ethical considerations in the design, deployment, and use of AI technologies.
Regulation of AI for Health (WHO outlines considerations for regulation of artificial intelligence for health, n.d.)	WHO provides considerations for the regulation of AI in health, aiming to harness its potential while minimizing risks.
Global Strategy on Digital Health 2020-2025 (World Health Organization, 2021)	WHO's Global Strategy on Digital Health outlines a framework to integrate digital technologies in health, promoting collaboration, national strategies, and people-centred systems. It aims to empower governments, enhance health system performance, build capacity, foster innovation, ensure data interoperability, and strengthen international cooperation for global adoption of digital health technologies by 2025.
Comprehensive Mental Health Action Plan 2013-2030 (World Health Organization, 2021)	The Plan recommends investing in digital infrastructure, building capacity for health workers to use digital tools and AI apps, and monitor and evaluate the implementation of digital mental health solutions.

UNICEF also advocates for the integration of digital health technologies, including AI, to enhance mental health services for children and adolescents (Table 3). Their approach emphasizes the importance of safeguarding, ethical considerations, and the promotion of children's rights in the development and implementation of AI systems.

**Table 3. UNESCO policy recommendations**

Digital Health and Information Systems (UNICEF, 2024)	UNICEF emphasizes the importance of digital health technologies in improving health outcomes for children and adolescents. This includes leveraging digital tools to enhance access to health services and information.
Safer Chatbots Implementation Guide (UNICEF, 2022)	UNICEF provides guidelines for implementing chatbots that prioritize user safety, especially for children and women. These guidelines are crucial for developing AI-driven chatbots that can offer mental health support while ensuring user protection. The guide addresses the need for chatbots to detect and respond to users in distress, particularly those experiencing gender-based violence or other traumatic experiences. It emphasizes the importance of safeguarding measures in chatbot design to protect vulnerable users.
Mental Health Innovation Portfolio (Mental Health Innovation Portfolio   UNICEF Office of Innovation, n.d.)	UNICEF's Mental Health Innovation Portfolio focuses on developing and scaling digital mental health interventions, including AI applications, to provide accessible support to children and adolescents. The portfolio has implemented transformative solutions across more than twenty countries, utilizing technologies such as AI, chatbots, apps, video games, and big data to deliver mental health support directly to children. Approximately 80% of the projects are classified as digital mental health interventions.
Policy Guidance on AI for Children (UNICEF, Ministry of Foreign Affairs of Finland, 2021)	UNICEF has developed policy guidance to promote children's rights in AI policies and practices, ensuring that AI systems uphold or do not undermine these rights. The guidance outlines nine requirements for child-centred AI, including supporting children's development and well-being, ensuring inclusion, prioritizing fairness and non-discrimination, protecting data and privacy, ensuring safety, providing transparency, empowering governments and businesses with knowledge of AI and children's rights, preparing children for AI developments, and creating an enabling environment.

<p>UNICEF's Approach to Digital Health (UNICEF Health Section Implementation Research and Delivery Science Unit and the Office of Innovation Global Innovation Centre, under the coordination of Maria Muñiz, Katharine McFadden and Stuart Campo, 2018)</p>	<p>UNICEF's approach to digital health aims to ensure that every child survives and thrives by leveraging digital technologies to further the goals of UNICEF's Strategy for Health 2016-2030.</p> <p>The approach provides guidance on how digital tools can support real-time data capture, evidence generation, and data use to identify and deliver services to children and adolescents most in need. It emphasizes the importance of protecting patient privacy, promoting community engagement, equity, and transparency, and increasing the accountability of governments.</p>
<p>AI Policy Guidance: How the World Responded (AI policy guidance: How the world responded   Innocenti Global Office of Research and Foresight, n.d.)</p>	<p>UNICEF has undertaken projects to understand the impact of AI systems on children, aiming to promote children's rights in AI policies and practices.</p> <p>The project culminated in the launch of guidance to help support and promote children's rights in AI policies and practices, raising awareness of how AI systems can uphold or undermine these rights.</p>

The scientific literature provides a wealth of insightful evidence-informed recommendations also on the more specific aspects of digital mental health interventions identifying promising opportunities to expand access to care, improve patient outcomes, and address the global mental health crisis. However, the importance of ensuring the efficacy, privacy, and accessibility of these tools cannot be overstated. The integration of telehealth, AI- mobile apps, digital CBT (cognitive behavioural therapy), and peer support, along with proper training and privacy measures, are key components for the successful digitalization of mental health care (Table 4).

**Table 4.** Policy recommendations related to the use of digital services and apps proposed in the scientific literature

Expand Access to Telehealth Services (Tsou et al., 2021)	Implement and expand telehealth platforms for mental health services, including video and phone consultations, particularly for underserved or rural populations.
Integrate AI and Chatbots for Preliminary Patient Assessment and Monitoring (Mahreen et al., 2024)	Use AI-driven tools and mental health chatbots to conduct preliminary mental health assessments, provide psychoeducation, and track patients' progress.
Enhance Digital Cognitive Behavioral Therapy (CBT) Programs (Sztein et al., 2018)	Promote and improve access to digital CBT programs, especially for patients who have barriers to attending traditional therapy (e.g., time constraints, social stigma).
Leverage Mobile Apps for Ongoing Monitoring and Support (De Witte et al., 2021)	Encourage the use of evidence-based mental health apps that can support users with ongoing symptom tracking, mindfulness, mood logging, and therapeutic exercises.
Increase Digital Literacy Among Healthcare Providers (Martin-Key et al., 2021)	Provide training for mental health professionals in digital tools, platforms, and data privacy to ensure they are competent in delivering digital interventions.
Address Data Privacy and Security Concerns (Benjumea et al., 2020)	Implement strong data protection protocols, ensuring that patients' personal and mental health data is securely handled.
Incorporate Peer Support and Online Communities (Smit et al., 2022)	Facilitate online peer support groups and communities to provide individuals with opportunities for shared experiences, emotional support, and encouragement.
Monitor and Evaluate Effectiveness Through Data Analytics (Rosenfeld et al., 2021)	Regularly analyse data from digital mental health interventions to assess their effectiveness and improve services.

The area that has attracted the attention of many academic scholars relate to the fast-growing field of AI-based applications in mental health care. AI holds great promise for revolutionizing mental health care by improving early diagnosis, treatment personalization, continuous monitoring, and decision-making. The integration of artificial intelligence (AI) in mental health has the potential to significantly improve the management of mental health disorders. By adopting AI strategically and collaboratively, mental health systems can enhance outcomes and provide accessible care to a broader population.

Below are evidence-based actionable recommendations for utilizing AI in mental health (Table 5).

<b>Table 5.</b> Policy recommendations related to the use of AI-based apps proposed in the scientific literature	
Use AI for Early Detection and Screening (Guo et al., 2024)	Implement AI-driven tools for early detection and screening of mental health conditions like depression, anxiety, and psychosis. These tools can analyse patterns in speech, text, and behaviour to identify early signs.
Develop AI-Powered Personalized Treatment Plans (Zafar et al., 2024)	Use AI to personalize treatment plans based on patient data, such as genetic information, past treatments, and behavioral patterns, to enhance outcomes.
Implement AI in Virtual Mental Health Assistants and Chatbots (Catania et al., 2024)	Integrate AI-powered virtual assistants and chatbots into mental health care systems to provide real-time support, psychoeducation, and coping strategies.
Utilize AI in Predictive Analytics for Suicide Risk Assessment (Atmakuru et al., 2025)	Employ AI systems to assess suicide risk by analysing data from multiple sources, including electronic health records, social media activity, and patient interviews.
AI-Driven Cognitive Behavioral Therapy (CBT) (Oliveira et al., 2023)	Promote the use of AI-powered CBT platforms for the treatment of mental health disorders like depression and anxiety, particularly for individuals unable to access traditional therapy.
AI for Monitoring and Continuous Assessment of Mental Health (Groot et al., 2023)	Use AI to track ongoing mental health status through wearables and mobile apps that monitor physiological data (e.g., sleep patterns, heart rate) and self-reported mood logs.
Enhance Decision-Making with AI in Clinical Settings (Kolding et al., 2024)	Incorporate AI into clinical decision-making tools to help mental health professionals make more informed choices about diagnosis, prognosis, and treatment.
Address Ethical Concerns and Ensure Transparency (Kasula 2023)	Develop clear ethical guidelines for the use of AI in mental health, focusing on data privacy, bias, and transparency in AI algorithms.
Promote AI Training and Awareness Among Mental Health Professionals (Taher et al., 2023)	Provide education and training for mental health professionals on how to integrate AI tools into their practice while maintaining patient-centred care.
Encourage Collaboration Between AI Developers and Mental Health Experts (Kellogg and Sadeh-Sharvit, 2022)	Foster collaboration between AI developers, mental health clinicians, and researchers to ensure that AI tools are developed with clinical relevance and ethical consideration in mind.

The recommendations outlined above in Tables 4 and 5 are consistent with the policy recommendations articulated by WHO, UNICEF and other international bodies. They encourage taking advantage of their multiple advantages but with caution, advocating for more evaluations, giving access to excluded populations and being particularly vigilant on ethical rules. These recommendations can be synthesized into the following nine categories:

*1. Expand Access to Digital and Telehealth Services*

- Implement and expand telehealth platforms for mental health services, including video and phone consultations, especially for underserved and rural populations.
- Leverage digital health technologies to improve access and support health outcomes.

*2. Integrate AI for Early Detection and Continuous Monitoring*

- Use AI-driven tools for early detection and screening of mental health conditions, such as depression, anxiety, and psychosis, by analysing speech, text, and behaviour patterns.
- Employ AI in predictive analytics for suicide risk assessment and to track ongoing mental health status via wearables and mobile apps.
- Promote AI-powered virtual assistants, chatbots, and cognitive behavioral therapy (CBT) platforms for real-time support, psychoeducation, and personalized treatment.

*3. Enhance Digital Interventions and Cognitive Behavioral Therapy (CBT)*

- Improve access to digital CBT programs, focusing on overcoming barriers such as stigma and time constraints.
- Use AI-powered CBT for treating conditions like depression and anxiety, particularly for individuals unable to access traditional therapy.

*4. Increase Digital Literacy and Capacity Building*

- Train mental health professionals on the use of digital tools, platforms, and AI technologies to ensure effective delivery of digital interventions.
- Develop strategies to increase digital literacy among healthcare providers to ensure data privacy and effective care delivery.

#### *5. Ensure Data Privacy, Ethical Use, and Security*

- Implement strong data protection protocols to safeguard patients' mental health data, in line with WHO's guidelines on ethical AI use.
- Address ethical concerns, focusing on transparency, data privacy, and bias in AI systems.

#### *6. Promote Peer Support and Community Engagement*

- Facilitate online peer support groups and communities to offer emotional support and shared experiences.
- Ensure that digital tools for mental health are designed with a focus on inclusivity, transparency, and community engagement.

#### *7. Foster Collaboration and Innovation in Mental Health Technology*

- Encourage collaboration between AI developers, mental health clinicians, and researchers to ensure that AI tools meet clinical needs while adhering to ethical guidelines.
- Support the development and scaling of digital mental health innovations tailored to local contexts.

#### *8. Monitor, Evaluate, and Improve Digital Health Interventions*

- Continuously monitor and evaluate the effectiveness of digital health interventions through data analytics to refine services and ensure they meet patient needs.
- Implement strong governance mechanisms for monitoring AI systems and digital health tools.

#### *9. Promote Children's Rights in Digital Mental Health Solutions*

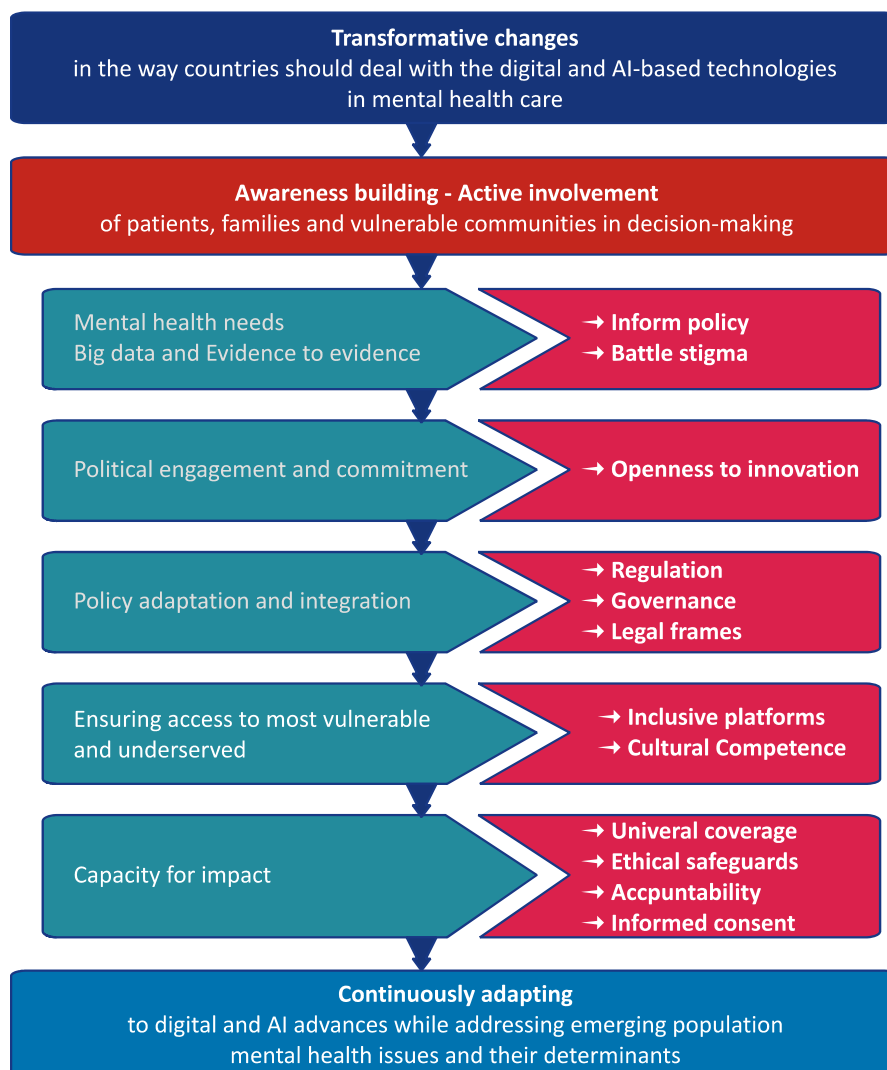
- Ensure that AI systems respect children's rights, focusing on safety, privacy, fairness, and inclusion in the development of digital mental health tools.
- Safeguard children's privacy and well-being in AI-driven mental health solutions, with a particular focus on safety measures in chatbot implementation.

By integrating these comprehensive policy recommendations, the digitalization of mental health care can be effectively advanced, ensuring increased accessibility, better outcomes, ethical use, and global collaboration in improving mental health services.

## Theory of change

A theory of change describes why a particular way of working will be effective by combining in a timely order key elements of change process. Figure 1 shows all the key components of a comprehensive approach in making transformative changes to address the integration of emerging digital and AI-based technologies in mental health care. This dynamic process must be designed and adapted to evolving political and strategic opportunities, taking into account the country's unique context and factors such as ongoing initiatives to strengthen health systems, recognizing that the process is rarely linear. The theory is designed with the United Nations Agenda 2030 and WHO's strategies on mental health and e-health in mind.

**Figure 1.** Theory of change



Adapted from WHO (2024), *Answering the Global Call – Health and Migration Strategy 2024-2030*

## **Chapter 5. Policy and strategic preconditions for successful implementation**

The digitalization of healthcare and the integration of AI applications into everyday practice are complex processes, involving a broad array of clinical, operational, and ethical challenges. Successful implementation requires collaboration among multiple stakeholders and disciplines. The integration of digital and AI technologies into mental health care is even more challenging due to the heightened sensitivities surrounding mental health conditions and the need to approach care with cultural and emotional awareness.

We are entering a new era that is steadily and profoundly transforming the delivery of mental health care. While it offers solutions to long-standing issues within the system, it also presents new and complex challenges that must be addressed.

Ad hoc, sporadic and non-systematic applications may complicate the process of change, creating confusion, unintended harm and exacerbating inequalities into the system. Leaders need clear and coherent guidance and support from scientific mental health community. They must address the critical political and scientific preconditions for meaningful and sustainable change which involves capacity building and long-term vision.

A structured, hierarchical framework is needed to guide the initiation, organization, and implementation of policy and planning decisions within the domain of digital mental health within the broader context of the digitalization of the entire health system (World Health Organization, 2023).

Therefore, it is essential to establish foundational preconditions that ensure policies are evidence-informed, values-driven, and that strategies are sustainable, impactful, and inclusive. These preconditions, arranged hierarchically, encompass political, legal/regulatory, strategic, technical, and operational dimensions, providing the basis for effective change. Attempting to introduce change without giving proper attention to this sequence may significantly hinder the implementation of comprehensive and well-thought-out approaches to digital and AI-driven mental health care.

Political commitment is critical, requiring strong leadership, long-term vision, and intersectoral collaboration. Countries must integrate digital and AI tools into broader health system development agendas while appropriate legal frameworks and fostering participatory governance, transparency, and accountability. Political visions need to be explicit about the values and principles on which digital and AI technologies will be introduced and applied in a given country.

Clear road mapping is important to outline priorities, set measurable goals, and guide progress effectively. Strategic planning should prioritize establishing multi-stakeholder partnerships, empowering individuals and communities and upgrading health systems infrastructure to accommodate digital and AI solutions in mental health care.

Technical and scientific expertise plays a pivotal role in providing reliable data, analytical tools, and access to scientific advice. Partnerships with academic and technical institutions are critical for informed policymaking, while continuous monitoring and evaluation ensure adaptability to evolving challenges. Adapting and finely tuning digital methods to local cultural and behavioural contexts is also very important.

Operational capacity is crucial to these efforts, requiring skilled personnel, robust institutional structures, and the implementation of advanced technologies, including telepsychiatry, AI-driven diagnostic and therapeutic apps, and vulnerability mapping tools.

By establishing clear roadmaps and prioritizing access at every level, decision-makers can effectively navigate the complex challenges of digital mental health, building sustainable and adaptive mental health care systems for the future.

Overall, the effectiveness of digital mental health care strategies can be significantly increased by engaging diverse stakeholders, by tailoring plans to the uniqueness of local contexts, by introducing mechanisms to safeguard the application of their ethical aspects, by highlighting multiple co-benefits of the digital transformation, by introducing systematic monitoring of clinical outcomes and service quality standards, by providing clear actionable implementation pathways, and by improving communication and outreach.

With regard to ensuring ethical standards in the application of digital and AI applications in mental health Table 6 outlines some of the most important steps that can be taken in a ‘multi-layered’ approach.

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**Table 6.** Ensuring Ethical Standards in Digital Mental Health and AI Applications: A Multi-Layered Approach

Countries must establish mechanisms and processes that continuously address the ethical and deontological implications of digital and AI-based applications across various societal sectors, with particular focus on healthcare. Given the unique challenges surrounding mental health, including both individual and societal sensitivities, it is crucial to prioritize ethical considerations in this domain. Below is a list of mechanisms and instruments that can assist countries in safeguarding ethical standards, ensuring that digital and AI-based tools in mental health care are deployed responsibly and effectively.

*Ethical Committees and Advisory Boards:* These groups should consist of mental health professionals, ethicists, legal experts, patient advocates, and AI specialists to regularly assess the ethical implications of digital mental health tools and AI applications. The Council of Europe advocates for the establishment of ethical committees to review AI and digital mental health tools before they are used in clinical or community settings. Ethical Committees are expected to examine the design, methodology, and implementation of AI tools to ensure that they do not violate fundamental human rights and are aligned with the principles of the European Convention on Human Rights (ECHR) and the Convention for the Protection of Human Rights and Dignity of the Human Being (the Oviedo Convention).

*Regulatory frameworks:* The implementation of AI in mental health must adhere to regulatory compliance standards. Governments and health authorities must establish clear regulatory frameworks that guide the ethical development and use of AI in mental health care and which aligned with existing medical standards. The Council of Europe’s AI Policy Framework (The Framework Convention on Artificial Intelligence - Artificial Intelligence - [www.coe.int](http://www.coe.int), n.d.) sets forth the importance of creating comprehensive regulatory systems to monitor the use of AI, ensuring that these tools are both safe and ethical.

*The establishment of Independent Oversight Bodies* to oversee the implementation and use of AI technologies (Berardi et al., 2024). The Council of Europe recommends that these bodies should include experts from a variety of fields, such as ethics, law, medicine, and technology.

*Ethical Guidelines and Frameworks:* Development and enforcement of clear ethical guidelines that align with established mental health principles, such as beneficence (promoting well-being), non-maleficence (doing no harm), autonomy (respecting patient rights), and justice (fairness and accessibility).The Council of Europe aligns with the European Commission's guidelines on ethical AI. According to these guidelines, AI systems used in mental health should be trustworthy and designed to prioritize user well-being.

*Ethical reviews* examine the potential risks of AI-based interventions for individuals' mental health, privacy, and autonomy as well as avoiding reinforcing or perpetuating bias and discrimination. Ethical review mechanisms are encouraged to ensure that AI-based tools are transparent in how decisions are made, explainable to patients and healthcare providers, and accountable in their outcomes. Such mechanisms must include robust informed consent processes and patients should be empowered to make decisions about their care. Of key importance is the involvement of diverse expertise, of the public and

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relevant stakeholders (e.g., patient groups, civil society and community groups) in the ethical review process. This ensures that digital health tools, including AI-based mental health interventions, meet the needs and expectations of the broader community and do not inadvertently harm vulnerable populations.

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*Ethical Impact Assessments (EIA):* The Council of Europe calls for EIAs to evaluate the societal and ethical consequences of AI systems.

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*AI Ethics Certification:* The Council of Europe encourages the creation of certification systems that ensure AI technologies are compliant with ethical standards. In the context of mental health, this certification would assess whether AI tools are aligned with human rights, medical ethics and ensure they meet clinical safety and efficacy standards.

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*Data privacy and security* is another critical layer in safeguarding the ethical use of digital mental health tools. AI applications in mental health often involve handling sensitive personal data, making it essential to establish robust data protection measures. Compliance with international laws such as the General Data Protection Regulation (GDPR) (EUR-Lex - 02016R0679-20160504 - EN - EUR-Lex, n.d.) is crucial for protecting patient privacy. The Council of Europe's Convention 108 (Convention 108 and Protocols - Data Protection - [www.coe.int](http://www.coe.int) n.d.) advocates for transparent and accountable data processing mechanisms, ensuring that personal data is handled with respect and care. Moreover, continuous Data Protection Impact Assessments (DPIAs) should be conducted to identify and mitigate the risks of data breaches and other potential vulnerabilities.

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*Fairness of AI algorithms:* As AI becomes more integrated into mental health care, it is paramount to address bias prevention and fairness in AI algorithms. The Council of Europe emphasizes the importance of non-discrimination in the development and deployment of AI systems, especially in healthcare. AI models must be trained on diverse and representative datasets to avoid perpetuating biases based on gender, race, socioeconomic status, or other demographic factors. This ensures that vulnerable and marginalized groups are not left behind.

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*Clinical validity and accountability* are paramount in ensuring that AI tools used in mental health are both safe and effective. The Council of Europe advocates for the clinical validation of AI-based tools through rigorous methods such as randomized controlled trials.

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*Patient-centred design* is also vital to ensure that AI tools meet the specific needs of individuals. The European Charter of Patients' Rights stresses the need for healthcare tools, including digital mental health applications, to be responsive to patients' needs and preferences. Engaging patients in the design process ensures that their experiences, concerns, and expectations are considered, leading to more user-friendly and effective tools. There have to be opportunities for patients to provide continuous feedback, ensuring that digital mental health tools remain responsive to their needs and concerns.

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Overall, the ethical application of AI and digital mental health tools requires a comprehensive, layered approach to ensure that patient rights, privacy, and well-being are safeguarded. This approach involves key mechanisms which focus on promoting transparency, fairness, clinical effectiveness, and regulatory compliance, all while engaging patients in the development and use of digital mental health solutions. Introducing such mechanisms and processes requires explicit political commitment and strong institutional capacity.

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A valuable tool for addressing complex issues that require developing a common understanding and consensus by different actors including politicians, multi-disciplinary academics, front-line professionals and civil society is policy dialogues (World

Health Organization 2015), (EU-Luxembourg - WHO Universal Health Coverage Partnership with funding from the European Union and the Grand Duchy of Luxembourg, 2015). The digital transformation of healthcare, particularly the integration of digital and AI-based technologies in mental health, demands attention in public discourse due to their complex, multifaceted, and interdisciplinary nature.

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**Table 7. Policy dialogues**

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Policy dialogues play a vital role in fostering good governance and democracy by ensuring that decision-making is enriched by diverse perspectives and grounded in the most reliable evidence available. (5th Policy Dialogue on Social Protection and Development 2024) A number of types of policy dialogues could be relevant in the case of the digital transformation of mental health care including, sharing information (informative policy dialogues), gathering feedback from stakeholders (consultative policy dialogues), consensus building (deliberative policy dialogues), explaining facts and evidence (advocacy policy dialogues) and developing joint-up strategies (strategic policy dialogues). Policy dialogues must be contextualized particularly when addressing complex issues such the introduction of digital and AI-based technologies in mental health care and its impact on health systems performance. It is crucial to assess the capacity of the country's health system to integrate and manage the new technologies.

Most importantly the dialogue must take into account the values and principles that underpin the country's approach to mental health, especially local issues related to inequalities, access to services, and discrimination. The discussion must be informed by scientific evidence, the guidance provided by competent international bodies and examples of good practice.

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The digitalization of mental health care and the introduction of AI-based tools are still in their early stages. There is a need to be open to anticipatory foresight (World Health Organization, 2024) in order to navigate future challenges and opportunities in this domain. Finally, aligning national actions with global commitments and recommendations, such as relevant WHO strategies and plans, addressing health inequalities, and promoting adherence to patient-centred ethical frameworks, are essential for success.

## Chapter 6. The case of Greece

The Greek government's National Mental Health Strategy 2015-2020 (7.5 Mental health, n.d.) (extended) and the National Action Plan for Mental Health 2020-2025 (7.5 Mental health, n.d.) both aim to strengthen and transform the country's mental health system, ensuring better access, comprehensive care, and reduced stigma for individuals with mental health conditions. The core objectives of the Strategy and the Action Plan are closely aligned, emphasizing the need for accessible, community-based care, with a strong focus on integration and accessibility.

The National Mental Health Strategy centres on reducing dependence on large psychiatric hospitals, promoting community-based care, and expanding services such as mental health centres, rehabilitation programs, and outpatient care. A crucial element of this strategy is the integration of mental health services into primary healthcare and general hospital settings, ensuring that mental health care is not isolated but is part of an inclusive, holistic approach to health. Additionally, the strategy prioritizes raising public awareness, combating stigma, and fostering early diagnosis and intervention.

Building on these foundations, the National Action Plan for Mental Health continues the work of the Strategy with a more targeted focus on vulnerable populations such as youth, the elderly, and marginalized groups. It seeks to improve access to mental health services for all citizens, especially those in remote or rural areas. The plan also emphasizes the importance of expanding mental health care within primary healthcare settings and creating effective crisis response services, such as crisis intervention teams and mental health helplines. Furthermore, it promotes mental health support within workplaces and educational environments, aiming to build resilience and well-being in these spaces.

Together, these two frameworks aim to create a robust, accessible, and compassionate mental health system that addresses the diverse needs of Greece's population. The Psychiatric Reform (Projects n.d.) will be further advanced with the creation of the National and Regional Networks of Mental Health Services (Geniki-grammateia-evaloton-politon-kai-thesmikis-prostasias, Ministry of Migration and

Asylum (2020) and the establishment of a surveillance and monitoring system of individuals receiving psychiatric treatment in order to ensure continuity of care.

The adoption of digital tools in healthcare is gaining significant importance in Greece, especially in terms of improving access to services and enhancing the overall quality of care. The National Digital Strategy for Healthcare (Greek Ministry of Digital Governance, 2019), commonly known as the eHealth Strategy, along with various initiatives from the Greek Ministry of Health, are focused on incorporating digital solutions to tackle healthcare challenges effectively. The National Digital Health Strategy sets the following objectives:

- To strengthen telemedicine services and remote care: Expand telemedicine services, especially in rural areas, to allow for consultations, diagnosis, and monitoring without the need for physical visits.
- To introduce digital health records and interoperability: Implement electronic health records (EHR) for all citizens to enable seamless data exchange between healthcare providers and improve decision-making.
- To promote mobile health applications: Promote the use of mobile health apps to monitor chronic conditions, provide medication reminders, and facilitate self-management of health.
- To ensure data protection and cybersecurity: Ensure strict data protection measures and cybersecurity protocols to protect patient information as digital tools are integrated into the healthcare system.
- To advance digital literacy and train healthcare professionals: Ensure that healthcare professionals are trained in using digital tools, such as telehealth platforms and electronic health records, to improve care delivery.

In recent years, Greece has also started implementing digital tools specifically for mental health care. The Greek healthcare system has integrated telepsychiatry, mental health mobile apps, and other digital solutions into national mental health strategies. Currently the following digital-based facilities are being implemented in Greece:

- Telepsychiatry: The Ministry of Health has rolled out telepsychiatry services, to ensure continued mental health care through virtual consultations.

- Digital mental health platforms: Greece has begun implementing digital platforms that provide mental health services, such as therapy apps and crisis intervention through mobile applications.
- Digital mental health literacy: There is a strong push to increase digital literacy among mental health professionals to ensure they can effectively use telemedicine platforms and digital tools to treat patients.
- Reducing barriers to access: The strategy aims to reduce geographic and socioeconomic barriers to accessing mental health care by offering digital mental health services, especially for underserved populations.

Greece has made significant progress in digitalizing its healthcare and mental health services, but challenges persist in several areas. One of the primary obstacles is ensuring digital inclusion, as many elderly individuals or those from disadvantaged backgrounds still face difficulties accessing digital health tools. Another critical issue is data privacy, as the increased use of digital technologies heightens concerns about safeguarding sensitive health information.

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**CASE STUDY: Telemedicine in Alzheimer’s disease in Greece**

Residents of remote areas in Greece often struggle to access high-quality healthcare services, a challenge that is even more pronounced for vulnerable groups like patients with dementia or mobility issues. Telemedicine, which provides medical services remotely, offers a powerful solution to this inequality. The National Telemedicine Network (EDIT) was established by the 2<sup>nd</sup> Health Region of Piraeus and the Aegean in 2016 to serve residents of the Aegean Islands, with plans for national expansion.

For effective and safe implementation of telemedicine services in Greece, several conditions must be met. A recent study detailed the nearly four-year experience of the scientific and clinical team at the "Memory, Dementia, and Parkinson's Disease Clinic through EDIT" at the A' University Neurology Clinic of Aeginition Hospital. Since March 2021, the clinic has been providing telemedicine consultations for patients with cognitive and motor disorders in the public health structures of the Aegean Islands. The study (Angelopoulou and Papageorgiou, 2024) highlights the steps taken to establish the clinic, the challenges faced, and the future plans for expanding its operations nationwide, leveraging EDIT's infrastructure.

Expected benefits of the clinic's expansion include equal access to specialized care for all citizens, regardless of location, early diagnosis, regular monitoring, proper management, improved quality of life and autonomy for patients, reduced caregiver burden, lower costs for patients, their families, and the national healthcare system, and faster adoption of telemedicine in Greece.

The interdisciplinary team of the clinic includes neurologists, neuropsychologists, a psychiatrist, and other healthcare professionals. Telemedicine consultations involve the

patient's medical history, neurological and neuropsychological assessments, and functional evaluations using various clinical scales. The consultations last about an hour, facilitated by a local healthcare professional, and utilize high-definition cameras and secure data networks to ensure privacy and quality.

The clinic's initial setup involved securing partnerships with Aeginition Hospital and the 2nd Health Region, defining the clinic's team, and training them in telemedicine technologies. A detailed evaluation protocol was developed, including psychological and neurological assessments adapted for remote consultations. Patients provided informed consent, and patient referrals were coordinated from regional healthcare providers.

Over time, challenges were identified, including the need for increased public awareness, more extensive training for healthcare professionals, and the lack of specific regulatory frameworks for telemedicine in Greece. These issues have hindered the full implementation of telemedicine services, especially for patients with mental health conditions like dementia and Parkinson's disease.

The national expansion of the clinic and EDIT network requires the development of telemedicine evaluation protocols for various specialties, the establishment of legal frameworks, and continuous service monitoring and improvement. Economic studies on the cost-benefit analysis of telemedicine are also essential for justifying its broader adoption.

Looking ahead, the clinic aims to enhance remote healthcare delivery, improve patient outcomes, and reduce healthcare costs. By increasing access to specialized care and improving patients' quality of life, the clinic serves as a model for other medical specialties. Efforts to inform and educate both healthcare professionals and the public about telemedicine's benefits and limitations will be crucial for its successful expansion.

As the network grows, the clinic expects increased patient demand, emphasizing the importance of securing ongoing funding and support to maintain its operations.



*Photo provided through personal communication with Director of Neurology Telemedicine Clinic, Professor Sokratis Papageorgiou: Coverage areas of the National Telemedicine Network (EDIT) in the Aegean Islands.*



Photo provided through personal communication with Director of Neurology Telemedicine Clinic, Professor Sokratis Papageorgiou: Typical setup of a telemedicine station.

## «Ιατρείο Μνήμης, Άνοιας & νόσου Πάρκινσον μέσω του Εθνικού Δικτύου Τηλεϊατρικής»

Α' Πανεπιστημιακή Νευρολογική Κλινική Αιγινήτειου Νοσοκομείου σε συνεργασία με τη 2η Υγειονομική Περιφέρεια Πειραιώς & Αιγαίου

**για την κάλυψη των νησιών του Αιγαίου μέσω της Τηλεϊατρικής**

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## «Ιατρείο Μνήμης, Άνοιας & νόσου Πάρκινσον μέσω του ΕΔΙΤ»

- Εξειδικευμένη νευρολογική & νευροψυχολογική αξιολόγηση από ιατρική ομάδα Α' Νευρολογικής Κλινικής Αιγινήτειου Νοσοκομείου ΕΚΠΑ
- Απευθύνεται σε άτομα με:**
  1. προβλήματα μνήμης ή άνοια
  2. διαταραχές βάδισης, πτώσεις, τρόμο ή νόσο Πάρκινσον
- Ώρες λειτουργίας:** κάθε **Τετάρτη** και **Παρασκευή, 09:00-13:00**
- Τρόπος εξέτασης:** Τηλεϊατρικά (μέσω βίντεο), από το Κέντρο Υγείας-Νοσοκομείο του νησιού σας. Περιλαμβάνεται και **εκτίμηση με τεστ μνήμης.**
- Για ραντεβού:** Επικοινωνήστε με το Γενικό ή τον Αγροτικό Ιατρό σας και εκείνοι μέσω του ΕΔΙΤ (τηλ.: 2132004348) θα σας κλείσουν ραντεβού μαζί μας.

Το ερευνητικό Έργο με τίτλο «Ανάπτυξη και Αξιολόγηση ενός καινοτόμου μοντέλου Τηλεϊατρικής για ασθενείς με νοητικές διαταραχές σε απομακρυσμένες περιοχές -TeleCognition» υλοποιείται στο πλαίσιο της δράσης του ΕΛ.Ι.Δ.Ε.Κ. «Χρηματοδότηση της Βασικής Έρευνας (Ορίζοντα υποστήριξη όλων των Επιστημών)» του Εθνικού Σχεδίου Ανάκαμψης και Ανθεκτικότητας «Ελλάδα 2.0» με τη χρηματοδότηση της Ευρωπαϊκής Ένωσης - NextGenerationEU (Αριθμός Έργου ΕΛ.Ι.Δ.Ε.Κ.: 16772).

Photo provided through personal communication with Director of Telemedicine Clinic, Professor Sokratis Papageorgiou: Poster-brochure created by the Aeginition Hospital Telemedicine team, which is given to residents and healthcare professionals of the islands to inform them about the clinic, in collaboration with the "Mobile Medical Units" and "Health for All" programs.

The protection and security of this data must remain a top priority to maintain trust in digital health services. Additionally, the training of healthcare workers in the use of digital health tools is essential for ensuring their effective implementation and enhancing their impact. Without proper training, healthcare professionals may struggle to fully adopt and utilize these tools, limiting their potential benefits.

These efforts are part of Greece's broader strategy to align with European Union initiatives and international standards (WHO) aimed at integrating digital health solutions into the healthcare system. By addressing these challenges, the Ministry of Health aims to improve the accessibility and efficiency of healthcare and mental health services, ensuring that digital advancements can be leveraged to benefit all segments of the population.

## **Chapter 7. Discussion and Conclusions**

The narrative of the digital transformation of mental health care and the use of AI-based technologies is constantly changing influenced by new developments and applications, and the increasing needs and demands for mental health services.

The question we asked in the beginning was whether the benefits of this wide array of technological developments outweigh legitimate concerns about their use and ethical implications. As it will be shown below the overall scientific verdict on the most widely used such technologies is positive with caution about two main parameters: the relative lack of definitive evidence about their effectiveness and also the need of robust regulatory frameworks to address ethical, human rights and legal issues.

In the first part of this chapter the positive and negative aspects of the main digital technologies applied in mental health care will be considered and in the second part a strategic synthesis of the policy and social dimensions of the digital and AI applications in mental health will be made.

The global mental health crisis highlights the urgent need for accessible and effective interventions. Chatbots powered by generative artificial intelligence (AI), such as ChatGPT, have emerged as the most promising solutions in mental health

care (Rauws, 2022). Several positive impacts and challenges were identified, along with key recommendations for improving these tools.

The Positive Aspects of Chatbots based on testimonies of users (Siddals et al., 2024) include: a) a sense of emotional sanctuary, providing a safe space for expressing feelings without fear of judgment. This aspect aligns with the therapeutic benefit of having a non-judgmental outlet for emotional expression, which some participants felt was less attainable in traditional human therapy settings; b) ability to provide insightful advice, particularly regarding relationships and personal growth. This guidance was often perceived as helpful, especially when users were dealing with trauma or loss; c) joyful feelings when connected with the chatbot, as they felt heard and understood; and last but not least d) seen as a valuable alternative but not substitute for human interaction particularly for those unable to access human therapists due to various constraints such as cost, availability, or stigma.

The reported negative and challenging aspects of Chatbots include: a) safety concerns in particular with regard to the lack of safety guardrails in the chatbot interactions including alerts to human therapists when a user is in distress and emergency situations; b) limited emotional intelligence and a feeling of mechanical connection lacking the depth and empathy when interacting with therapists; and c) a danger of over-reliance and of becoming dependent on Chatbots.

Generative AI chatbots in mental health care offer promising opportunities to enhance access to support, particularly for those unable to access traditional services. However, several challenges need to be addressed. Key improvements include integrating better safety features to handle emotional distress and emergencies, such as real-time monitoring by human therapists and crisis intervention protocols. Enhancing the emotional intelligence of chatbots through advanced natural language processing and affective computing would bridge the gap between AI and human emotional understanding.

While AI chatbots can effectively provide psychoeducation (Denecke et al., 2021) and promote treatment adherence, they should complement, not replace, human therapy. As the field evolves, further research is essential to refine AI chatbot

technology, improve its effectiveness, and ensure its ethical and safe integration into mental health care, enhancing accessibility and support for diverse user needs.

Another crucial and rapidly expanding sector is Telemedicine and particularly telepsychiatry offering significant opportunities to enhance accessibility and address the growing need for mental health services (Kister et al., 2023). The increasing use of telepsychiatry, especially in video consultations, brings both benefits and challenges, which require careful consideration to maximize its effectiveness and improve patient outcomes.

One of the key advantages of telepsychiatry is its ability to increase access to mental health care, particularly in regions affected by a shortage of medical professionals. Telepsychiatry eliminates geographical barriers, allowing patients to receive care regardless of their location, and it can be especially valuable for individuals living in rural, underserved areas or conservative societies where mental illness is stigmatized. Telepsychiatry can also help bypass cultural barriers, such as those related to traditional views on mental health, by offering an anonymous and safe environment for patients to seek help without fear of judgment (Lin et al., 2022). It also reduces the costs associated with travelling to appointments, which can be a significant barrier for many individuals. Research comparing teletherapy with traditional in-person therapy (Cowan et al., 2020) has shown that teletherapy produces similar treatment outcomes, including symptom reduction, at both post-treatment and follow-up stages.

The negative and challenging aspects of telepsychiatry include the difficulty in establishing a strong therapeutic alliance through a screen. Creating a meaningful connection with patients can be challenging when the therapeutic interaction is mediated by technology. This can hinder the development of trust, which is essential for effective therapy, especially in complex mental health cases. Technical issues such as poor internet connectivity, platform malfunctions, or inadequate hardware can disrupt therapy sessions and contribute to client attrition. Lastly it should be noted that some groups, such as the elderly, the blind, and the deaf, may face challenges in accessing or adjusting to or benefiting from telepsychiatry due to technological barriers or difficulties in communication. Additionally, certain patients

may have difficulty adjusting to telehealth platforms or feel uncomfortable with the virtual format, which may impact their engagement in therapy.

Telepsychiatry lacks comprehensive guidelines in relation to handling medical errors and ensuring the safety and confidentiality of patients and clear protocols to address potential issues such as emergencies, patient crises, or suicidal ideation, ensuring that clinicians are equipped to respond appropriately.

To improve telepsychiatry, platforms should be user-friendly, reliable, and optimized for various devices. Building strong therapeutic alliances requires better communication, therapist adaptability, and occasional in-person sessions (Ratheesh and Alvarez-Jimenez, 2022). Telepsychiatry should cater to diverse patient needs, including those with disabilities or low-tech literacy. Thus, in conclusion telepsychiatry offers increased access to care but faces challenges. Clear guidelines, improved technology, stronger relationships, and accessibility are key to its success. Ongoing research is crucial to refine practices and maximize its potential.

Smartphone apps for delivering psychological interventions have gained significant popularity, capitalizing on the widespread use of smartphones and the growing app market focused on mental health. Despite the potential of these digital solutions, the evidence surrounding the efficacy of standalone apps for treating mental health symptoms remains unclear (Miralles et al., 2020).

One of the most significant advantages of smartphone apps for mental health is their ability to increase access to psychological interventions. Apps allow users to engage in therapy or mental health management anytime and anywhere, removing geographical and logistical barriers. This is especially important for individuals who may otherwise face challenges in accessing traditional therapy due to cost, stigma, or location. Smartphone apps provide a cost-effective alternative to in-person therapy. Since many people already own smartphones, the cost of these apps tends to be lower than traditional therapy sessions. Furthermore, apps are typically available around the clock, providing users with a convenient, flexible option to manage their mental health. A meta-analysis (Weisel et al., 2019) found that standalone apps had a significant impact on certain mental health conditions particularly when targeted towards specific disorders like depression or substance use. Smartphone apps are designed to address the most prevalent disorders, such as

depression, anxiety, and substance use and, in this way, can help in reducing the burden on the mental health care system by supplementing or complementing in-person treatment.

While some trials show promising results, the overall evidence on the efficacy of standalone smartphone apps for treating mental health symptoms is still inconclusive (Gamble, 2020). The evidence indicates that the effectiveness of these apps is limited to certain conditions and may not be as effective for a broad range of mental health disorders. Furthermore, many mental health apps lack the ability to tailor interventions to the unique needs of individual users. Lastly the effectiveness of smartphone apps is often hindered by technical barriers such user interface design while some populations, such as the elderly or those with disabilities, may have trouble using these apps effectively. As is the case with other applications there are concerns about privacy and security regarding their use and the risk of dependence and over-reliance on them may prevent patients seek comprehensive psychiatric treatments.

To enhance smartphone apps for mental health, further research, personalization, better user experience, integration with support systems, and stronger privacy protections are necessary. While promising, these apps should complement, not replace, traditional care, especially for complex conditions.

The use of smart wearable devices to monitor mental health, particularly for detecting anxiety, depression, and stress, has gained significant attention in recent years (Hickey et al., 2021). One of the major advantages of smart wearable devices is their ability to provide continuous, real-time monitoring of such physiological indicators. Wearable technologies provide objective data that can complement subjective assessments from patients or healthcare providers. This data can help in identifying patterns or fluctuations in physiological markers that may indicate changes in mental health status, thus facilitating more informed decision-making and personalized treatment plans. These devices are designed to be portable and easy to use. Many smart wearable devices can be integrated with other health monitoring systems or mobile apps, providing a holistic view of an individual's physical and mental health.

However, concerns have been raised about their accuracy and reliability with regard to the measurement of parameters such as electrodermal activity in varying environmental conditions. There is also concern that wearable devices may lead to over-reliance, potentially neglecting professional intervention and in-person therapy (Long et al., 2022). Additionally, privacy and security concerns regarding sensitive mental health data highlight the need for strict regulations and secure data transmission to build user trust.

Smart wearable devices can revolutionize mental health monitoring, but improvements in accuracy, privacy, and integration with professional care are needed. Further research and advanced algorithms will enhance their effectiveness in detecting and managing conditions like anxiety and depression.

Research into value co-creation in online communities reveals several positive aspects related to the impact of belongingness (Liu et al., 2020) and social support on member behaviour. The sense of belonging fosters a positive cycle where members feel empowered to contribute valuable information and support to others.

Virtual reality (VR) offers significant potential (Bell et al., 2020) for enhancing mental health assessment and treatment. One of the most prominent positive aspects of VR is its ability to create highly controlled, immersive environments that are ecologically valid, simulating real-world experiences. VR can enhance personalization and engagement by adapting the environment to the individual's needs and preferences. VR technologies can also provide clinicians with valuable insights into a patient's behaviors, emotional responses, and progress, making it an effective tool for both research and clinical settings. The development of VR-based treatments for mental health conditions, including anxiety, depression, PTSD, and eating disorders, is rapidly advancing (Bell et al., 2024). The use of gamification, biofeedback, and artificial intelligence (AI) within VR further enhances accessibility and engagement. These technological developments promise to increase the efficacy of treatments by providing interactive, dynamic, and personalized therapeutic environments. Moreover, VR-based treatments have the potential to be more accessible, reducing barriers such as stigma or geographic constraints that prevent individuals from accessing traditional therapy. They allow an immersive approach offers insights into the psychological and physiological processes behind addictive behaviors, opening

doors for more effective therapeutic strategies. VR's ability to integrate multi-sensory experiences, including visual, auditory, olfactory, and tactile stimuli, creates realistic and engaging environments that could significantly enhance addiction treatment programs (Mazza et al., 2021).

Negative effects include over-reliance on online communities, high costs and technical barriers in VR, data interpretation challenges, and privacy concerns in both online communities and VR treatments, which may compromise user trust and data security.

To address these challenges, recommendations focus on enhancing support systems in online communities by fostering a more inclusive environment and integrating professional healthcare support to prevent over-reliance on peer-to-peer interactions (Pretorius et al., 2019). In VR, efforts should be made to reduce the cost of hardware, develop more portable options, and train healthcare providers to use VR effectively. Collaborations between technology developers, researchers, and healthcare providers are key to making VR treatments more accessible, particularly in under-resourced areas. Technical challenges in VR should be addressed by improving reliability and consistency in virtual environments and enhancing data interpretation tools to help clinicians utilize VR data effectively. Additionally, more user-centred research is needed to adapt VR technologies to individual needs. Lastly, to mitigate ethical and privacy concerns, both online communities and VR-based treatments must adhere to strict privacy standards and data security regulations, including implementing encrypted communication, obtaining informed consent, and ensuring transparency in data usage. Establishing clear ethical guidelines for VR treatments and content moderation in online communities is essential to protect users' well-being and privacy.

The use of digital interventions, particularly self-guided apps or web-based platforms, has shown potential in reducing suicidal ideation and behaviors (Torok et al., 2020). Direct interventions that target suicidality directly were found to be effective in reducing suicidal thoughts immediately post-intervention (Forte et al., 2021). These interventions offer a promising alternative for individuals who are unwilling or unable to access face-to-face care. The scalability and sustainability of

digital interventions are particularly beneficial in reaching large populations, which is crucial in the global context of rising suicide rates.

Digital interventions provide a safe, accessible, and anonymous space for individuals facing suicidal ideation, particularly in conservative societies. They offer effective alternatives for non-engagers in face-to-face therapy and enable real-time monitoring for early intervention, including through social media algorithms that identify at-risk individuals for timely support.

Digital interventions for suicidality face challenges such as limited efficacy for certain populations (Sutori et al., 2024), insufficient long-term research, and difficulties meeting evidence-based standards. Ethical concerns regarding data privacy, technology barriers, and the potential misidentification of at-risk individuals further complicate their effectiveness, especially for underserved or less tech-savvy populations.

To enhance digital interventions for suicidality, focus on developing tailored, theory-based interventions targeting suicidal ideation. Improve research by conducting more randomized controlled trials and assessing long-term outcomes (Stefanopoulou et al., 2020). Integrate digital tools with traditional care, ensuring privacy and security standards are met. Improve accessibility, usability, and focus on adolescent populations. These improvements can ensure digital tools effectively complement traditional mental health care, especially in underserved regions.

The digitalization of mental health care, including the integration of artificial intelligence (AI), presents immense potential for improving accessibility, increasing efficiency, and delivering personalized care (Brunn et al., 2020). However, this transformation (Bond et al., 2023) brings with it a set of significant challenges that need careful consideration. Key concerns include privacy issues, the necessity for quality control, and the establishment of regulatory frameworks to ensure that digital mental health tools are both effective and safe. Striking the right balance between advancing technology and maintaining ethical practices will be essential to ensuring that digital mental health solutions provide maximum benefits while minimizing the risks.

One of the major opportunities in digital mental health is its potential to address global disparities in access to care. AI-driven solutions can extend mental

health services to underserved populations, such as those in low- and middle-income countries, as well as individuals in conflict zones, elderly people, and children. These advancements are crucial in bridging the gap where traditional mental health services are scarce. The ability to implement telepsychiatry, mobile apps, and AI-powered platforms allows people in remote or underserved areas to access care more easily, providing real-time assessments and quicker interventions.

Furthermore, the integration of AI into existing healthcare systems can enhance the effectiveness of traditional mental health services. By assisting clinicians with decision support systems, AI can improve diagnostic accuracy, reduce human error, and create more streamlined, continuous care. Digital tools are also scalable, meaning they can reach large populations without a corresponding increase in human resources, thus improving service efficiency. Additionally, AI can help to tailor treatment plans to individual needs, improving patient outcomes. Personalized treatments, such as digital cognitive behavioral therapy (CBT) apps, offer targeted support for conditions like anxiety and depression, while virtual reality therapies could prove effective for treating PTSD, phobias, and other mental health issues.

The rapid pace of AI innovation also creates opportunities for ongoing advancements in the diagnosis, monitoring, and treatment of mental health conditions. By analysing vast amounts of data, AI can identify patterns and trends that might otherwise go unnoticed, leading to new insights into the nature of mental health disorders and ways to treat them. This is particularly beneficial for conditions where traditional methods have been less effective.

Despite these opportunities, the shift to digital mental health care raises several challenges. Privacy and security remain major concerns, particularly as vast amounts of sensitive personal and health data are collected and stored. The increased reliance on AI to analyze this data presents the potential for misuse or breaches if not properly regulated. Additionally, the quality of digital tools varies, with some lacking regulatory oversight, which could lead to unverified or ineffective treatments. There is a pressing need for comprehensive standards and guidelines to ensure the safety and efficacy of digital mental health interventions.

Another issue is the potential for over-reliance on digital solutions, which could undermine the human element of care. While AI can provide valuable support,

it cannot replicate the empathy, understanding, and nuanced care that human clinicians offer. For many individuals, especially those with complex mental health issues, face-to-face interactions remain essential. Moreover, AI systems are not immune to biases. If the data used to train these systems is flawed or unrepresentative, it could lead to misdiagnoses or discriminatory outcomes for marginalized groups. This issue further highlights the importance of integrating human oversight into AI-driven mental health care.

Equity concerns also need to be addressed. While digital tools have the potential to expand access to care, they may inadvertently exclude certain populations. Those who lack access to reliable internet, or who live in rural or impoverished areas, may find it difficult to utilize digital mental health solutions effectively. Furthermore, the digital literacy required to engage with these tools could create barriers for older adults, individuals with disabilities, or those without technological expertise.

The ethical implications of AI in mental health care also cannot be ignored. There are concerns about AI making autonomous treatment decisions or overriding clinician judgment. The potential for legal issues, such as liability in the event of harm resulting from an AI-driven tool, remains unclear, posing risks to both patients and providers. The National Committee on Bioethics and Technoethics in Greece has published a comprehensive report offering guidance on the applications of AI in healthcare. The report acknowledges the positive impact of AI on healthcare while emphasizing the importance of people-centred approaches, respect for human rights, and the preservation of the doctor-patient relationship (National Committee on Bioethics and Technoethics, 2024). Furthermore, the rapid pace of digital innovation may outstrip regulatory frameworks, leading to gaps in consumer protection and oversight.

Despite these challenges, the digital transformation of mental health care holds great promise. AI and digital tools can make mental health services more accessible, efficient, and personalized, especially for underserved populations. However, these tools must be implemented carefully, with attention to privacy, equity, and quality control. Regulatory standards need to evolve alongside technological advancements to ensure that these solutions are safe and effective.

Additionally, addressing the potential risks associated with over-reliance on technology and ensuring that human clinicians remain a central part of the care process will be crucial. By overcoming these challenges, digital mental health solutions can play a significant role in transforming mental health care globally, offering a new path forward for individuals who have long been underserved by traditional mental health systems.

In conclusion the hypothesis that “The positive impacts of the intersection of the digital transformation and AI with mental health appear to significantly outweigh its negative effects which can be effectively limited through value- driven policies, regulatory and legal frameworks.” is fully supported by the evidence and facts presented in this study. The scientific evidence shows that digital mental health tools, including AI, offer significant potential to improve accessibility and efficiency in mental health care. Very importantly the integration of AI can enhance diagnostic accuracy and streamline continuous care, particularly in underserved regions. There is an imperative that privacy and security concerns must be addressed to ensure trust and safety in digital tools. It was repeatedly emphasized that over-reliance on technology could undermine the human element of mental health care, highlighting the importance of human oversight. Lastly ethical and equity issues must underpin all systematic efforts to continuously address in particular biases in AI and limited access to the impressive array of tools that are being increasingly available to the global community. Mental health and its determinants are fundamental for human wellbeing and at the very core of sustainable and social development values. A series of global crises, including financial instability, the pandemic, and the looming threats of climate change, have significantly heightened levels of stress and uncertainty within the population. The digitalization of mental health care has the potential to make a positive difference in addressing these challenges.

## Epilogue

The digital transformation of mental health care, fuelled by AI and digital tools, offers promising solutions to global disparities in access and efficiency. However, as technology rapidly evolves, we must remain cautious and mindful of the ethical, privacy, and accessibility challenges it brings. Ensuring that digital solutions complement, not replace, human clinicians, and addressing issues such as AI biases, over-reliance, and equity gaps will be crucial in harnessing their full potential to improve mental health outcomes for all. With careful development, oversight, and collaboration, digital mental health tools can lead to a more accessible, efficient, and personalized future for care worldwide. Brunn's expression "The future is knocking" about the fundamental change AI has brought into psychiatry says it all (Brunn et al., 2020).

## Bibliography

5th Policy Dialogue on Social Protection and Development (2024). *OECD* [online].

Available from: <https://www.oecd.org/en/events/2024/12/5th-oecd-policy-dialogue-on-social-protection-and-development.html> [accessed 9 January 2025].

7.5 *Mental health*. Available from:

<https://national-policies.eacea.ec.europa.eu/youthwiki/chapters/greece/75-mental-health> [accessed 8 January 2025].

A comprehensive approach to mental health - European Commission. Available

from: [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-life/european-health-](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-life/european-health-union/comprehensive-approach-mental-health_en)

[union/comprehensive-approach-mental-health\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-life/european-health-union/comprehensive-approach-mental-health_en) [accessed 7 January 2025].

AI in psychiatry will help, but is not a substitute for physicians. (2024). *American*

*Medical Association* [online]. Available from:

<https://www.ama-assn.org/practice-management/digital/ai-psychiatry-will-help-not-substitute-physicians> [accessed 7 January 2025].

AI policy guidance: How the world responded | Innocenti Global Office of Research

and Foresight. Available from: <https://www.unicef.org/innocenti/stories/ai-policy-guidance-how-world-responded> [accessed 7 January 2025].

Angelopoulou, E. and Papageorgiou, S.G. (2024). Telemedicine in Alzheimer's disease

and other dementias: Where we are? *Journal of Alzheimer's disease: JAD*, 5 December 2024, p.13872877241298295.

Anguera, J.A., Gunning, F.M. and Areán, P.A. (2017). Improving late life depression

and cognitive control through the use of therapeutic video game technology: A proof-of-concept randomized trial. *Depression and Anxiety*, 34(6), pp. 508-517.

Artificial intelligence in mental health research: new WHO study on applications and

challenges. Available from: <https://www.who.int/europe/news-room/06-02-2023-artificial-intelligence-in-mental-health-research--new-who-study-on-applications-and-challenges> [accessed 7 January 2025].

- Atmakuru, A., Shahini, A., Chakraborty, S., Seoni, S., Salvi, M., Hafeez-Baig, A., Rashid, S., Tan, R.S., Barua, P.D., Molinari, F. and Acharya, U.R. (2025). Artificial intelligence-based suicide prevention and prediction: A systematic review (2019-2023). *Information Fusion*, 114, p. 102673.
- Bell, I.H., Pot-Kolder, R., Rizzo, A., Rus-Calafell, M., Cardi, V., Cella, M., Ward, T., Riches, S., Reinoso, M., Thompson, A., Alvarez-Jimenez, M. and Valmaggia, L. (2024). Advances in the use of virtual reality to treat mental health conditions. *Nature Reviews Psychology*, 3(8), pp. 552-567.
- Bell, I.H., Nicholas, J., Alvarez-Jimenez, M., Thompson, A. and Valmaggia, L. (2020). Virtual reality as a clinical tool in mental health research and practice. *Dialogues in Clinical Neuroscience*, 22(2), pp. 169-177.
- Benjumea, J., Ropero, J., Rivera-Romero, O., Dorrnzoro-Zubiete, E. and Carrasco, A. (2020). Privacy Assessment in Mobile Health Apps: Scoping Review. *JMIR mHealth and uHealth*, 8(7), p. e18868.
- Berardi, C., Antonini, M., Jordan, Z., Wechtler, H., Paolucci, F. and Hinwood, M. (2024). Barriers and facilitators to the implementation of digital technologies in mental health systems: a qualitative systematic review to inform a policy framework. *BMC Health Services Research*, 24(1), p. 243.
- Bond, R.R., Mulvenna, M.D., Potts, C., O'Neill, S., Ennis, E. and Torous, J. (2023). Digital transformation of mental health services. *Npj Mental Health Research*, 2(1), p. 13.
- Brunn, M., Diefenbacher, A., Courtet, P. and Genieys, W. (2020). The Future is Knocking: How Artificial Intelligence Will Fundamentally Change Psychiatry. *Academic Psychiatry*, 44(4), pp. 461-466.
- Carl, J.R., Jones, D.J., Lindhiem, O.J., Doss, B.D., Weingardt, K.R., Timmons, A.C. and Comer, J.S. (2022). Regulating digital therapeutics for mental health: Opportunities, challenges, and the essential role of psychologists. *The British Journal of Clinical Psychology*, 61 Suppl 1, pp. 130-135.
- Catania, J., Beaver, S., Kamath, R.S., Worthington, E., Lu, M., Gandhi, H., Waters, H.C. and Malone, D.C. (2024). Evaluation of Digital Mental Health Technologies in the United States: Systematic Literature Review and Framework Synthesis. *JMIR Mental Health*, 11(1), p. e57401.

- Chen, K., Huang, J.J. and Torous, J. (2024). Hybrid care in mental health: a framework for understanding care, research, and future opportunities. *NPP—Digital Psychiatry and Neuroscience*, 2(1), pp. 1-4.
- Constitution of the World Health Organization. Available from: <https://www.who.int/about/governance/constitution> [accessed 9 January 2025].
- Convention 108 and Protocols - Data Protection - www.coe.int. Data Protection* [online]. Available from: <https://www.coe.int/en/web/data-protection/convention108-and-protocol> [accessed 8 January 2025].
- Cowan, A., Johnson, R. and Close, H. (2020). Telepsychiatry in Psychotherapy Practice. *Innovations in Clinical Neuroscience*, 17(4-6), pp. 23-26.
- Denecke, K., Abd-Alrazaq, A. and Househ, M. (2021). Artificial Intelligence for Chatbots in Mental Health: Opportunities and Challenges. In: Househ, M., Borycki, E., and Kushniruk, A., eds. *Multiple Perspectives on Artificial Intelligence in Healthcare: Opportunities and Challenges*. Cham: Springer International Publishing, pp. 115-128. Available from: [https://doi.org/10.1007/978-3-030-67303-1\\_10](https://doi.org/10.1007/978-3-030-67303-1_10) [accessed 8 January 2025].
- De Witte, N.A.J., Joris, S., Van Assche, E. and Van Daele, T. (2021). Technological and Digital Interventions for Mental Health and Wellbeing: An Overview of Systematic Reviews. *Frontiers in Digital Health*, 3, p. 754337.
- Ebert, D.D., Zarski, A.-C., Christensen, H., Stikkelbroek, Y., Cuijpers, P., Berking, M. and Riper, H. (2015). Internet and Computer-Based Cognitive Behavioral Therapy for Anxiety and Depression in Youth: A Meta-Analysis of Randomized Controlled Outcome Trials. *PLOS ONE*, 10(3), p.e0119895.
- EU-Luxembourg-WHO Universal Health Coverage Partnership with funding from the European Union and the Grand Duchy of Luxembourg. (2015). *Briefing Note: Policy dialogue: What it is and how it can contribute to evidence-informed decision-making*.
- EUR-Lex - 02016R0679-20160504 - EN - EUR-Lex. Available from: <https://eur-lex.europa.eu/eli/reg/2016/679/2016-05-04/eng> [accessed 9 January 2025].
- European Court of Human Rights and Council of Europe. (1950). European Convention on Human Rights. France: European Court of Human Rights and

- Council of Europe. Available from:  
[https://www.echr.coe.int/documents/d/echr/convention\\_eng](https://www.echr.coe.int/documents/d/echr/convention_eng).
- European Health Data Space - European Commission. (2024). Available from:  
[https://health.ec.europa.eu/ehealth-digital-health-and-care/european-health-data-space\\_en](https://health.ec.europa.eu/ehealth-digital-health-and-care/european-health-data-space_en) [accessed 7 January 2025].
- European Psychiatric Association - EPA. (2024). European Psychiatric Association [online]. Available from: <https://www.europsy.net/> [accessed 7 January 2025].
- Forte, A., Sarli, G., Polidori, L., Lester, D. and Pompili, M. (2021). The Role of New Technologies to Prevent Suicide in Adolescence: A Systematic Review of the Literature. *Medicina*, 57(2), p. 109.
- Gamble, A. (2020). Artificial intelligence and mobile apps for mental healthcare: a social informatics perspective. *Aslib Journal of Information Management*, 72(4), pp. 509-523.
- Galatzer-Levy, I.R., Aranovich, G.J. and Insel, T.R. (2023). Can Mental Health Care Become More Human by Becoming More Digital? *Daedalus*, 152(4), pp. 228-244.
- GDPR Archives. *GDPR.eu* [online]. Available from: <https://gdpr.eu/tag/gdpr/> [accessed 7 January 2025].
- Geniki-grammateia-evaloton-politon-kai-thesmikis-prostasias | Ministry of Migration and Asylum (2020), 10 June 2020. Available from:  
<https://migration.gov.gr/en/grammateies/geniki-grammateia-evaloton-politon-kai-thesmikis-prostasias/> [accessed 9 January 2025].
- Graham, S., Depp, C., Lee, E.E., Nebeker, C., Tu, X., Kim, H.-C. and Jeste, D.V. (2019). Artificial Intelligence for Mental Health and Mental Illnesses: an Overview. *Current Psychiatry Reports*, 21(11), p. 116.
- Greek Ministry of Digital Governance. (2019). *Digital Transformation Strategy 2019-2023*. Greek Ministry of Digital Governance. Greece. Available from:  
[https://digitalstrategy.gov.gr/website/static/website/assets/Digital\\_Transformation\\_Strategy\\_2019.pdf](https://digitalstrategy.gov.gr/website/static/website/assets/Digital_Transformation_Strategy_2019.pdf).
- Groot, J., MacLellan, A., Butler, M., Todor, E., Zulfiqar, M., Thackrah, T., Clarke, C., Brosnan, M. and Ainsworth, B. (2023). The Effectiveness of Fully Automated Digital Interventions in Promoting Mental Well-Being in the General

- Population: Systematic Review and Meta-Analysis. *JMIR Mental Health*, 10(1), p.e44658.
- Guo, R., Guo, H., Wang, L., Chen, M., Yang, D. and Li, B. (2024). Development and application of emotion recognition technology — a systematic literature review. *BMC Psychology*, 12(1), p. 95.
- Hagi, K., Kurokawa, S., Takamiya, A., Fujikawa, M., Kinoshita, S., Iizuka, M., Furukawa, S., Eguchi, Y. and Kishimoto, T. (2023). Telepsychiatry versus face-to-face treatment: systematic review and meta-analysis of randomised controlled trials. *The British Journal of Psychiatry: The Journal of Mental Science*, 223(3), pp. 407-414.
- Health Care: Clinical Applications, Barriers, Facilitators, and Artificial Wisdom. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 6(9), pp. 856-864.
- Hermes, S., Riasanow, T., Clemons, E.K., Böhm, M. and Krcmar, H. (2020). The digital transformation of the healthcare industry: exploring the rise of emerging platform ecosystems and their influence on the role of patients. *Business Research*, 13(3), pp. 1033-1069.
- Hickey, B.A., Chalmers, T., Newton, P., Lin, C.-T., Sibbritt, D., McLachlan, C.S., Clifton-Bligh, R., Morley, J. and Lal, S. (2021). Smart Devices and Wearable Technologies to Detect and Monitor Mental Health Conditions and Stress: A Systematic Review. *Sensors*, 21(10), p.3461.
- Holzmeyer, C. (2021). Beyond 'AI for Social Good' (AI4SG): social transformations— not tech-fixes—for health equity. *Interdisciplinary Science Reviews*, 46(1-2), pp. 94-125.
- Home. Available from: <https://www.psychiatry.org:443/> [accessed 7 January 2025].
- Hunkin, H., King, D.L. and Zajac, I.T. (2020). Perceived acceptability of wearable devices for the treatment of mental health problems. *Journal of Clinical Psychology*, 76(6), pp. 987-1003.
- Kalman, J.L., Burkhardt, G., Samochowiec, J., Gebhard, C., Dom, G., John, M., Kilic, O., Kurimay, T., Lien, L., Schouler-Ocak, M., Vidal, D.P., Wiser, J., Gaebel, W., Volpe, U. and Falkai, P. (2024). Digitalising mental health care: Practical

- recommendations from the European Psychiatric Association. *European Psychiatry*, 67(1), p. e4.
- Kasula, B.Y. (2023). Ethical Considerations in the Adoption of Artificial Intelligence for Mental Health Diagnosis. *International Journal of Creative Research In Computer Technology and Design*, 5(5), pp. 1-7.
- Katarya, R. and Maan, S. (2020). *Predicting Mental health disorders using Machine Learning for employees in technical and non-technical companies*. 2020 IEEE International Conference on Advances and Developments in Electrical and Electronics Engineering (ICADEE), 10 December 2020, pp. 1-5.
- Kellogg, K.C. and Sadeh-Sharvit, S. (2022). Pragmatic AI-augmentation in mental healthcare: Key technologies, potential benefits, and real-world challenges and solutions for frontline clinicians. *Frontiers in Psychiatry* [online], 13. Available from:  
<https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsy.2022.990370/full> [accessed 9 January 2025].
- Kister, K., Laskowski, J., Dybała, E. and Makarewicz, A. (2023). Are we ready for Telepsychiatry? Benefits and challenges of digital psychotherapy. *Current Problems of Psychiatry*, 2023, pp. 52-67.
- Kolding, S., Lundin, R.M., Hansen, L. and Østergaard, S.D. (2024). Use of generative artificial intelligence (AI) in psychiatry and mental health care: a systematic review. *Acta Neuropsychiatrica*, 11 November 2024, pp. 1-14.
- Lee, E.E., Torous, J., De Choudhury, M., Depp, C.A., Graham, S.A., Kim, H.-C., Paulus, M.P., Krystal, J.H. and Jeste, D.V. (2021). Artificial Intelligence for Mental Health. *Journal of the American Academy of Child and Adolescent Psychiatry*, 60(12), pp. 1060-1073.
- Leech, T., Dorstyn, D., Taylor, A. and Li, W. (2021). Mental health apps for adolescents and young adults: A systematic review of randomised controlled trials. *Children and Youth Services Review*, 127, p. 106073.
- Lin, T., Heckman, T.G. and Anderson, T. (2022). The efficacy of synchronous teletherapy versus in-person therapy: A meta-analysis of randomized clinical trials. *Clinical Psychology: Science and Practice*, 29(2), pp. 167-178.
- Liu, S., Xiao, W., Fang, C., Zhang, X. and Lin, J. (2020). Social support, belongingness, and value co-creation behaviors in online health communities. *Telematics and Informatics*, 50, p. 101398.

- Long, N., Lei, Y., Peng, L., Xu, P. and Mao, P. (2022). A scoping review on monitoring mental health using smart wearable devices. *Mathematical biosciences and engineering: MBE*, 19(8), pp. 7899-7919.
- Mahreen, Z.S.H., Zainuldin, N.A. and Zhang, M.W. (2024). Comprehensive synthesis of mHealth interventions in psychiatry: insights from systematic, scoping, narrative reviews and content analysis. *Singapore Medical Journal*, 65(10), pp. 536-543.
- Martin-Key, N.A., Schei, T.S., Barker, E.J., Spadaro, B., Funnell, E., Benacek, J., Tomasik, J. and Bahn, S. (2021). The Current State and Diagnostic Accuracy of Digital Mental Health Assessment Tools for Psychiatric Disorders: Protocol for a Systematic Review and Meta-analysis. *JMIR Research Protocols*, 10(1), p. e25382.
- Masri, D., Jaber, L., Mashal, R., Albourini, F., Alsaoud, M.A. and Al-Tarawneh, A.M.A. (2024). *The Role of Wearables & Technology in Mental Health: Review*. 2024 2nd International Conference on Cyber Resilience (ICCR), 26 February 2024, pp. 1-5.
- Mazza, M., Kammler-Sücker, K., Leménager, T., Kiefer, F. and Lenz, B. (2021). Virtual reality: a powerful technology to provide novel insight into treatment mechanisms of addiction. *Translational Psychiatry*, 11(1), p. 617.
- Mental health*. Available from: <https://www.who.int/news-room/factsheets/detail/mental-health-strengthening-our-response> [accessed 7 January 2025].
- Mental Health Innovation Portfolio | UNICEF Office of Innovation*. Available from: <https://www.unicef.org/innovation/mental-health-innovation> [accessed 7 January 2025].
- Miralles, I., Granell, C., Díaz-Sanahuja, L., Van Woensel, W., Bretón-López, J., Mira, A., Castilla, D. and Casteleyn, S. (2020). Smartphone Apps for the Treatment of Mental Disorders: Systematic Review. *JMIR mHealth and uHealth*, 8(4), p. e14897.
- Moran, M. (2023). APA Urges Caution About Incorporating AI Into Clinical Practice. *Psychiatric News* [online], 58(08). Available from:

<https://psychiatryonline.org/doi/10.1176/appi.pn.2023.08.8.57> [accessed 7 January 2025].

National Committee on Bioethics and Technoethics, (2024) Report on AI and Health, Εθνική Επιτροπή Βιοηθικής και Τεχνοηθικής | Ελληνική Δημοκρατία

Ogugua, J.O., Okongwu, C.C., Akomolafe, O.O., Anyanwu, E.C. and Daraojimba, O.D. (2024). Mental Health and Digital Technology: A Public Health Review of current trends and responses. *International Medical Science Research Journal*, 4(2), pp. 108-125.

Okoro, Y.O., Ayo-Farai, O., Maduka, C.P., Okongwu, C.C. and Sodamade, O.T. (2024). THE ROLE OF TECHNOLOGY IN ENHANCING MENTAL HEALTH ADVOCACY: A SYSTEMATIC REVIEW. *International Journal of Applied Research in Social Sciences*, 6(1), pp. 37-50.

Olawade, D.B., Wada, O.Z., Odetayo, A., David-Olawade, A.C., Asaolu, F. and Eberhardt, J. (2024). Enhancing mental health with Artificial Intelligence: Current trends and future prospects. *Journal of Medicine, Surgery, and Public Health*, 3, p. 100099.

Oliveira, C., Pacheco, M., Borges, J., Meira, L. and Santos, A. (2023). Internet-delivered cognitive behavioral therapy for anxiety among university students: A systematic review and meta-analysis. *Internet Interventions*, 31, p. 100609.

Patel, V. et al., (2018). The Lancet Commission on global mental health and sustainable development. *The Lancet*, 392(10157), pp. 1553-1598.

Pretorius, C., Chambers, D. and Coyle, D. (2019). Young People's Online Help-Seeking and Mental Health Difficulties: Systematic Narrative Review. *Journal of Medical Internet Research*, 21(11), p. e13873.

Preventive Interventions for the Self-Management of Suicidality. *Journal of Technology in Behavioral Science*, 9(3), pp. 440-451.

Projects. Available from:

<https://www.espa.gr/en/Pages/BestPractices.aspx?sectors=Health+-+Welfare> [accessed 9 January 2025].

Ratheesh, A. and Alvarez-Jimenez, M. (2022). The future of digital mental health in the post-pandemic world: Evidence-based, blended, responsive and

- implementable. *The Australian and New Zealand Journal of Psychiatry*, 56(2), pp. 107-109.
- Rauws, M. (2022). The Rise of the Mental Health Chatbot. In: Lidströmer, N. and Ashrafian, H., eds. *Artificial Intelligence in Medicine*. Cham: Springer International Publishing, pp. 1609-1618. Available from: [https://doi.org/10.1007/978-3-030-64573-1\\_218](https://doi.org/10.1007/978-3-030-64573-1_218) [accessed 8 January 2025].
- Regulation - EU - 2024/1689 - EN - EUR-Lex*. Available from: <https://eur-lex.europa.eu/eli/reg/2024/1689/oj/eng> [accessed 7 January 2025].
- Robinson, A., Flom, M., Forman-Hoffman, V.L., Histon, T., Levy, M., Darcy, A., Ajayi, T., Mohr, D.C., Wicks, P., Greene, C. and Montgomery, R.M. (2024). Equity in Digital Mental Health Interventions in the United States: Where to Next? *Journal of Medical Internet Research*, 26, p. e59939.
- Rosenfeld, A., Benrimoh, D., Armstrong, C., Mirchi, N., Langlois-Therrien, T., Rollins, C., Tanguay-Sela, M., Mehlretter, J., Fratila, R., Israel, S., Snook, E., Perlman, K., Kleinerman, A., Saab, B., Thoburn, M., Gabbay, C. and Yaniv-Rosenfeld, A. (2021). 6 - Big Data analytics and artificial intelligence in mental healthcare. In: Khanna, A., Gupta, D., and Dey, N., eds. *Applications of Big Data in Healthcare*. Academic Press, pp. 137-171. Available from: <https://www.sciencedirect.com/science/article/pii/B9780128202036000011> [accessed 9 January 2025].
- Siddals, S., Torous, J. and Coxon, A. (2024). 'It happened to be the perfect thing': experiences of generative AI chatbots for mental health. *Npj Mental Health Research*, 3(1), p. 48.
- Smit, D., Vrijnsen, J.N., Broekman, T., Groeneweg, B. and Spijker, J. (2022). User Engagement Within an Online Peer Support Community (Depression Connect) and Recovery-Related Changes in Empowerment: Longitudinal User Survey. *JMIR Formative Research*, 6(11), p. e39912.
- Stefanopoulou, E., Hogarth, H., Taylor, M., Russell-Haines, K., Lewis, D. and Larkin, J. (2020). Are digital interventions effective in reducing suicidal ideation and self-harm? A systematic review. *Journal of Mental Health (Abingdon, England)*, 29(2), pp. 207-216.

- Sutori, S., Hadlaczky, G., Eliasson, E., Wasserman, D. and Carli, V. (2024). *Systematic Review and Meta-Analysis: Effectiveness of Stand-Alone Digital Suicide*.
- Sztejn, D.M., Koransky, C.E., Fegan, L. and Himelhoch, S. (2018). Efficacy of cognitive behavioural therapy delivered over the Internet for depressive symptoms: A systematic review and meta-analysis. *Journal of Telemedicine and Telecare*, 24(8), pp. 527-539.
- Taher, R., Hsu, C.-W., Hampshire, C., Fialho, C., Heaysman, C., Stahl, D., Shergill, S. and Yiend, J. (2023). The Safety of Digital Mental Health Interventions: Systematic Review and Recommendations. *JMIR Mental Health*, 10(1), p. e47433.
- THE 17 GOALS | Sustainable Development. Available from: <https://sdgs.un.org/goals> [accessed 7 January 2025].
- The Council of Europe: guardian of Human Rights, Democracy and the Rule of Law for 700 million citizens - Portal - *www.coe.int*. Portal [online]. Available from: <https://www.coe.int/en/web/portal> [accessed 7 January 2025].
- The Framework Convention on Artificial Intelligence - Artificial Intelligence - *www.coe.int*. *Artificial Intelligence* [online]. Available from: <https://www.coe.int/en/web/artificial-intelligence/the-framework-convention-on-artificial-intelligence> [accessed 8 January 2025].
- Torok, M., Han, J., Baker, S., Werner-Seidler, A., Wong, I., Larsen, M.E. and Christensen, H. (2020). Suicide prevention using self-guided digital interventions: a systematic review and meta-analysis of randomised controlled trials. *The Lancet Digital Health*, 2(1), pp. e25-e36.
- Tsou, C., Robinson, S., Boyd, J., Jamieson, A., Blakeman, R., Yeung, J., McDonnell, J., Waters, S., Bosich, K. and Hendrie, D. (2021). Effectiveness of Telehealth in Rural and Remote Emergency Departments: Systematic Review. *Journal of Medical Internet Research*, 23(11), p. e30632.
- UNICEF. (2022). Safer Chatbots Implementation Guide: A safer digital world for children and women, one chat at a time. New York. Available from: <https://www.unicef.org/media/114681/file/Safer-Chatbots-Implementation-Guide-2022.pdf>.

UNICEF. (2024). UNICEF Digital Health and Information Systems Annual report 2023.

Available from:

<https://www.unicef.org/media/161666/file/Annual%20Report%202023-0713.pdf.pdf>.

UNICEF Health Section Implementation Research and Delivery Science Unit and the Office of Innovation Global Innovation Centre, under the coordination of Maria Muñiz, Katharine McFadden and Stuart Campo. (2018). *UNICEF's Approach to Digital Health*. New York. Available from:

<https://www.unicef.org/innovation/media/506/file/UNICEF%27s%20Approach%20to%20Digital%20Health%E2%80%8B%E2%80%8B.pdf>.

UNICEF, Ministry of Foreign Affairs of Finland. (2021). Policy guidance on AI for children. New York. Available from:

<https://www.unicef.org/innocenti/media/1341/file/UNICEF-Global-Insight-policy-guidance-AI-children-2.0-2021.pdf>.

Valmaggia, L.R., Latif, L., Kempton, M.J. and Rus-Calafell, M. (2016). Virtual reality in the psychological treatment for mental health problems: An systematic review of recent evidence. *Psychiatry Research*, 236, pp. 189-195.

Volpe, U., Orsolini, L., Ramalho, R., Ransing, R., Samal, S. and Gaebel, W. (2024). The Current Status of Global Digital Mental Health Implementation: Results and Implications of a Web-Based Survey from All WPA Regions. *Journal of Technology in Behavioral Science* [online], 30 October 2024. Available from: <https://doi.org/10.1007/s41347-024-00447-1> [accessed 7 January 2025].

Weisel, K.K., Fuhrmann, L.M., Berking, M., Baumeister, H., Cuijpers, P. and Ebert, D.D. (2019). Standalone smartphone apps for mental health-a systematic review and meta-analysis. *NPJ digital medicine*, 2, p. 118.

World Health Organization. (2015). Policy Dialogue: What it is and how it can contribute to evidence-informed decision-making. Retrieved from <https://ahpsr.who.int/resources/meeting-report-item/policy-dialogue-what-it-is-and-how-it-can-contribute-to-evidence-informed-decision-making>

WHO outlines considerations for regulation of artificial intelligence for health.

Available from: <https://www.who.int/news/item/19-10-2023-who-outlines->

considerations-for-regulation-of-artificial-intelligence-for-health [accessed 7 January 2025].

World Health Organization. (2023). *Regulatory considerations on artificial intelligence for health*. Available from:

<https://iris.who.int/bitstream/handle/10665/373421/9789240078871-eng.pdf?sequence=1>.

WHO releases AI ethics and governance guidance for large multi-modal models.

Available from: <https://www.who.int/news/item/18-01-2024-who-releases-ai-ethics-and-governance-guidance-for-large-multi-modal-models> [accessed 7 January 2025].

World Health Organization. (2021a). *Comprehensive Mental Health Action Plan 2013-2030*. Copenhagen. Available from:

<https://iris.who.int/bitstream/handle/10665/345301/9789240031029-eng.pdf?sequence=1>.

World Health Organization. (2021b). *Global strategy on digital health 2020-2025* [online]. World Health Organization. Available from:

<https://iris.who.int/handle/10665/344249> [accessed 7 January 2025].

World Health Organization. (2024). *Leading the Future of Global Health with Responsible Artificial Intelligence*. Available from:

[https://cdn.who.int/media/docs/default-source/digital-health-documents/who\\_brochure\\_ai-vision\\_web.pdf?sfvrsn=70d41da7\\_3&download=true](https://cdn.who.int/media/docs/default-source/digital-health-documents/who_brochure_ai-vision_web.pdf?sfvrsn=70d41da7_3&download=true)

World Health Organization. (2022). *Mental Health and COVID-19: Early evidence of the pandemic's impact*. Geneva. Available from:

<https://iris.who.int/bitstream/handle/10665/352189/WHO-2019-nCoV-Sci-Brief-Mental-health-2022.1-eng.pdf?sequence=1>.

World Health Organization. (2019). *WHO guideline: Recommendations on digital interventions for health system strengthening*. Geneva. Available from:

<https://iris.who.int/bitstream/handle/10665/311941/9789241550505-eng.pdf?sequence=31>.

Yousufi, M., Damaševičius, R. and Maskeliūnas, R. (2024). Multimodal Fusion of EEG and Audio Spectrogram for Major Depressive Disorder Recognition Using Modified DenseNet121. *Brain Sciences*, 14(10), p. 1018.

Zafar, F., Fakhare Alam, L., Vivas, R.R., Wang, J., Whei, S.J., Mehmood, S., Sadeghzadegan, A., Lakkimsetti, M. and Nazir, Z. (2024). The Role of Artificial Intelligence in Identifying Depression and Anxiety: A Comprehensive Literature Review. *Cureus*, 16(3), p. e56472.

Zidaru, T., Morrow, E.M. and Stockley, R. (2021). Ensuring patient and public involvement in the transition to AI-assisted mental health care: A systematic scoping review and agenda for design justice. *Health Expectations*, 24(4), pp. 1072-1124.