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Current State of the Art and Implications for Clinical Practice of Internet- and Mobile-Based Psychological Interventions

An EFPA Narrative Review

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Abstract: In 2018, the European Federation of Psychologists' Associations (EFPA) published a report summarising the evidence on Internet- and mobile-based psychological interventions (IMIs) for the prevention and treatment of mental health disorders. Given the rapid developments in this field, an updated narrative review was conducted to provide a broad overview of the literature addressing multiple perspectives on the use of IMIs. The review outlines the definition, types, purposes, and current evidence of IMIs; examines the emerging role of AI; and discusses practical considerations, including limitations and challenges (e.g., adverse effects, legal and ethical issues), implementation barriers, inequalities and inclusion, and their current use in routine care. Results across these domains paint a nuanced picture, summarising the potential as well as the pitfalls of IMIs. In the discussion, key conclusions emerge: IMIs that include therapist guidance tend to achieve higher adherence and more reliable clinical outcomes, while matching support to users' needs is crucial for scalability. Tailoring content and sustaining engagement are critical determinants of success. Effective implementation of IMIs requires careful attention to ethical concerns and thoughtful integration of AI. Practical barriers, such as limited access and the digital divide, must also be addressed to ensure these interventions are adopted fairly and equitably. Overcoming these challenges will require continued cooperation among researchers, clinicians, users, policymakers, and IT stakeholders.

Keywords: Internet-and-mobile-based interventions, mental health disorders, artificial intelligence, implementation

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In 2018, the European Federation of Psychologists' Associations (EFPA) e-health taskforce published a report on internet- and mobile-based psychological interventions (IMIs), which provided an overview and summarized evidence regarding the use and efficacy of IMIs for the prevention and treatment of mental health disorders (Ebert et al., 2018). Over the past few years, particularly accelerated by the COVID-19 pandemic, the field of digital mental health has seen exponential growth and transformation, accelerating its adoption and reinforcing its role in mental health care. Consequently, the use of IMIs, whether as supplementary or stand-alone interventions, became more common (Sorkin et al., 2021; Wang et al., 2023).

Research findings over the past 5 years have reinforced the efficacy of IMIs in various psychological domains, expanding the evidence base for a wide range of mental health conditions (De Witte et al., 2021). Emerging technologies have also significantly transformed the landscape of IMIs. Artificial intelligence (AI) and machine learning (ML) are now being integrated to tailor interventions based on individual user data, thereby enhancing personalization and engagement. AI-driven chatbots can provide immediate support and psychoeducation, while advanced analytics enable IMIs to adapt in real time to users' needs and progress (Gutierrez et al., 2024). Wearable technology and smartphone sensors' integration have expanded IMIs' capabilities, allowing for passive data collection on behavior and physiological states, which can be used to deliver timely interventions and track changes over time (Konstantinou, et al., 2020; Niemeijer et al., 2022). Although the evidence base for the added value above "conventional" IMIs remains limited to date, these innovations have the potential to make IMIs more interactive, responsive, and accessible.

The policy and regulatory landscape also evolved, as governments and health organizations worldwide increasingly recognize the importance of digital mental health solutions. At the same time, ethical challenges arise, including privacy issues, an increasing number of publicly available non-evidence-based IMIs, and inequities in terms of IMIs' reach. Facilitators, barriers to engagement, and strategies for implementing IMIs in real-life settings become increasingly important, as sustained engagement has been challenging to achieve (Karekla et al., 2019).

Therefore, given this growing literature, new evidence, the integration of adjacent technologies, and novel challenges, an update to the original EFPA report was warranted to ensure the reflection of the current state-of-the-art. In a preparatory initial meeting, the members of the EFPA Health Psychology Standing Committee that volunteered to this task of updating the previous report, discussed these developments and reached a consensus about the aims and the main topics to be addressed: a brief overview of IMIs definition and varieties; the different forms of therapist involvement; the main purposes and current evidence base; the impact of AI on IMIs; privacy, legal and ethical challenges; and questions regarding the implementation of IMIs.

Review Approach

To perform this review, we followed a narrative approach aimed at offering a broad and updated synthesis of the literature on IMIs. Rather than applying a systematic selection protocol, we conducted targeted searches in databases such as PubMed, PsycINFO, Web of Science and Scopus between September 2024 and March 2025. Key search terms included combinations such as "internet-based interventions" OR "mobile-based interventions" OR "internet- and mobile-based psychological interventions" OR "e-mental health" OR "digital mental health" AND ("effectiveness" OR "evidence base" OR "AI integration" OR "ethical issues" OR "implementation" OR "therapist involvement" OR "privacy"). Boolean operators and wildcards (e.g., "AI in mental health*") were used to refine results. Relevant reviews and empirical studies published between 2018 and 2024 were prioritized. Although no language restrictions were applied, all included publications were in English.

Inclusion criteria emphasized relevance to the consensus topics identified by the EFPA Health Psychology Standing Committee, favouring peer-reviewed reviews, empirical studies (e.g., RCTs, observational), and conceptual papers. Exclusion criteria omitted nonpsychological digital interventions, pre-2018 sources (unless of particular significance), and low-rigor materials (e.g., non-referenced blogs). Additional sources were identified through backward citation tracking and expert consultation.

Searches retrieved a few thousand records across databases. A targeted screening of relevant sources resulted in 97 included references: 34 systematic reviews/meta-analyses, 8 umbrella/scoping reviews, 29 empirical studies, 16 conceptual/ethical papers, 2 consensus/policy reports, and 8 guidelines. This process ensured comprehensive coverage while accommodating the field's interdisciplinary and rapidly evolving nature.

Characterizing Internet- and Mobile-Based Interventions

The field of IMIs has developed very quickly, with an abundance of different approaches, methods, and techniques. The result is a heterogeneous field that has given rise to a profuseness of inconsistently used terms. Smoktunowicz et al. (2020) identified 45 different terms, varying from

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"chat treatment" to "teletherapy", to refer to psychological, behavioral and self-help interventions, and propose that a task force should be created to devise a standard glossary as a potential remedy for this state of affairs.

We will stick with the definition from Andersson (2018), who defined "internet interventions" as psychosocial interventions mediated by the internet that aim to prevent or treat mental health problems. We will only slightly expand this umbrella-like definition by also including mobile, as an increasing amount of internet interventions are no longer delivered through desktop computers but rely on mobile technology, i.e. smartphones.

In this paper, in line with the previous EFPA report (Ebert et al., 2018), we decided to exclude synchronous telepsychology, i.e., live, real-time video or audio interaction. The rationale for this decision was that this type of intervention – where a psychologist conducts a session remotely – represents a field on its own, with more overlap with the traditional format of face-to-face therapy. Similarly, other technologies, such as immersive technologies (e.g., virtual and augmented reality) or social media, also show promise (De Witte et al., 2021) but are considered out of scope for this report.

Varieties of Therapist Involvement

IMIs typically combine a technological component with a specific therapeutic or support framework, allowing them to either enhance face-to-face services or serve as standalone solutions. In terms of therapist involvement, IMIs include unguided, guided, and blended interventions, each with varying levels of interaction and human support.

Unguided Interventions

Unguided interventions refer to self-help IMIs that users can access independently and progress through at their own pace. These interventions involve no contact with or support from professionals, allowing users to navigate the content autonomously. Structured modules and tools are often included to facilitate learning and skill development, providing a flexible and accessible approach to mental health support and self-improvement. However, they sometimes lack therapeutic depth and adequate risk management (Bubolz et al., 2020; Crosby & Bonnington, 2020) and may be associated with limited treatment adherence (Baumel et al., 2019; Woolley et al., 2024).

Guided Interventions

Guided self-help interventions are a widely used format that provides structured, evidence-based content for users to engage with independently. While users complete most tasks on their own, these interventions also include professional support, such as progress monitoring, personalized feedback, and guidance. This combination of self-directed activities and expert input helps users stay on track and enhances their overall engagement with the program or app (Andersson, 2016).

Blended Interventions

IMIs come with challenges, even in a guided format, including the need for digital literacy, self-reflection skills, and potential difficulties in handling crises due to the lack of nonverbal cues. These limitations often make them more suitable for milder mental health issues. To balance the benefits and drawbacks of both approaches, an integrated form has been developed named "blended" treatments or interventions (Erbe et al., 2017) that combines face-to-face psychotherapy with IMIs. Rather than replacing direct interaction with the therapist, blended interventions aim to optimize the benefits of traditional psychological treatment with the flexibility and accessibility technology offers. Blended treatments have the potential to reduce the costs of mental health care by shortening treatment duration and reducing the need for extensive therapist contact (Kooistra et al., 2016), and to expand IMIs to more severe conditions (Ehrt-Schäfer et al., 2023), even if more research in these areas is needed.

Current Evidence Regarding the Degree of Therapist Involvement

Given these varieties of delivering IMIs, one pertinent question concerns the effects each has under different conditions and contexts of application. The findings support that, in general, IMIs work better with guidance, but it also depends on the specific intervention and population. Moreover, there is not enough research based on direct comparisons between guided and unguided interventions to answer this question definitively.

In a systematic review and meta-analysis on Internet-delivered Cognitive behavior therapy (iCBT) for depression by Karyotaki et al. (2021), the average adherence was 76% for guided iCBT and 54% for unguided iCBT, highlighting the potential for human support to improve the impact of IMIs, particularly for individuals with greater symptom severity. The umbrella review by Zhang et al. (2024) also found that guided IMIs led to better treatment adherence, a finding echoed by Käll et al. (2024), who noted that therapist-guided iCBT was associated with steeper symptom reductions in anxiety and higher effect sizes for different conditions. Nevertheless, unguided iCBT was still effective for disorders such as depression, insomnia, and social anxiety, while not yielding significant benefits for PTSD, suggesting that certain conditions may require more

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structured therapeutic support. However, the lack of direct head-to-head trials limits definitive conclusions about the relative efficacy of the two approaches. Future research should prioritize well-powered studies that compare guided and unguided interventions across different psychiatric conditions to determine where therapist involvement is most crucial.

Furthermore, the comparison between highly trained mental health professionals (e.g., clinicians) and paraprofessional-level (e.g., students or non-clinicians) supporters suggests that advanced clinical training is not a prerequisite for providing effective human support (Werntz et al., 2023). Studies that have included professional guidance and engagement reminders (e.g., supportive text messages, calls, personalized feedback) along with smartphone apps have also shown larger effect sizes on mental health outcomes compared to those that do not (Karyotaki et al., 2017; Linardon et al., 2019).

Main Purposes and Current Evidence Base

The multifaceted nature of IMIs is reflected in their use throughout the continuum of intervention. They have been successfully applied to the promotion and prevention of mental health, treatment, recovery and relapse prevention of mental health difficulties, and management of chronic conditions.

Promotion and Prevention

The potential benefits of IMIs in an early stage or prior to the development of a mental health disorder are evident, since the internet allows the opportunity to scale up interventions to entire populations. The research in this area is still scarce compared to interventions, but the empirical results obtained up to now seem to endorse the positive expectations. In a meta-analysis, Sander et al. (2016) found moderate to small effect sizes of programs aiming at preventing depression, anxiety, and eating disorders, while a more recent meta-analysis by Noh and Kim (2023) showed stronger evidence for benefits of this kind of program directed to adolescents when aiming at depression, but not as much for anxiety or stress.

College students have also been targeted frequently by IMIs. Lattie et al. (2018), in a systematic review, retrieved 89 studies on IMIs for depression, anxiety, and enhancement of psychological well-being in college students. Although many of those studies were treatment intervention programs, 36 were universal prevention programs. They found that over 70% of the studies were either effective or partially effective in affecting the outcome variables. Keeping users motivated is particularly challenging when offering preventive IMIs. Saleem et al. (2021) conducted a scoping review of mental health promotion IMIs with specific engagement strategies. They found that personalized support during the intervention, access to social support, and personalized feedback fostered adherence.

Treatment

The most common format of IMIs are treatment protocols addressing specific mental health problems, such as depression, anxiety, stress, or other mental health issues. Most of the time, these IMIs involve an online treatment platform by which the client accesses the treatment. Gradually, these treatment platforms have become accessible not only by a webpage, but more and more with mobile apps, by which clients (and therapists) may access the treatment. Contrasting with face-to-face teletherapy, these treatments typically do not require any synchronous encounter with a therapist; rather, the person is asked to interact autonomously with the platform. The specific features of these treatments vary, but they always have specific contents (in different formats, such as text, graphics, photos, audio, or video files), guiding the person through the platform and proposing activities aimed at intervening in specific issues (e.g., behavioral activation). These platforms may also include assessment procedures, such as self-report measures or even ecological momentary assessments that may be used to monitor the client's progress. They may also allow communication between the clinician/researcher and the client.

Given the growing interest and demand for digital mental health solutions, researchers continue to investigate their effectiveness across different psychiatric and somatic conditions, and nowadays, there is an impressive proliferation not only of studies but also of systematic reviews and meta-analyses. Given this overall scenario, we thus opted to highlight two recent umbrella reviews aimed at assessing the overall effectiveness of IMIs, the role of therapist guidance, and the challenges related to dropout rates and long-term adherence.

A recent large umbrella review of 87 meta-analyses assessing the effectiveness of IMIs (encompassing interventions based on phone/short message service support, applications, social media and websites), covering 1683 randomized controlled trials (RCTs) and 295,589 patients, found a great variety of mental health problems addressed, namely depression, anxiety disorders, addiction, PTSD, suicidal ideation, stress, obsessive-compulsive disorder, and various personality disorders (Zhang et al., 2024). Another umbrella review of 39 meta-analyses of iCBT delivered in an asynchronous manner via either a web platform or an app covered interventions addressing varying difficulties, such as depression, anxiety, suicidal ideation, grief after bereavement, stress, eating disorders, somatic disorders, and sleep (Käll et al., 2024).

Regarding the type of intervention, the most common model used is the cognitive-behavioral, but Zhang et al.

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(2024) specified different kinds of models in which these treatments are based, such as behavioral activation, exposure therapy, problem-solving therapy, dialectical behavior therapy, interpersonal therapy, psychodynamic therapy, supportive therapy, social skills training, acceptance and commitment therapy (ACT), mindfulness therapy, cognitive remediation therapy, cognitive training, psychoeducation, attentional bias modification, motivational interviewing, internet-based trauma-focused writing sessions, person-centred therapy, exposure and response prevention, motivational enhancement therapy and behavioral couple therapy.

When considering all these kinds of types of interventions, IMIs showed significant effects, varying from moderate effect sizes in treating anxiety disorders (*SMD* = 0.53) and post-traumatic stress disorder (PTSD) (*SMD* = 0.63), to smaller effects for depression (*SMD* = 0.45), stress (*SMD* = 0.41, 95%), OCD (*SMD* = 0.47), suicidal ideation (*SMD* = 0.23), and addiction (*SMD* = 0.23), while no significant effects were observed for personality disorders (Zhang et al., 2024).

The umbrella review by Käll et al. (2024) found that iCBT was generally effective in reducing symptoms of depression and anxiety, though effect sizes were slightly smaller than in previous reviews. One possible explanation for this result is the wider application in milder situations, such as stress in the workplace, which may have created a ceiling effect. The review also reported effects of iCBT across various target groups, with outcomes ranging from small effects (e.g., *SMD* = 0.10 for stress among employees) to large effects (e.g., *SMD* = 1.20 for depressive symptoms among older adults). Additionally, the review expanded the scope of iCBT efficacy to include conditions such as tinnitus, chronic pain, and workplace mental health interventions, showing relevant effects. However, it also highlighted a lack of robust evidence for psychotic disorders and the need for more methodologically rigorous meta-analyses.

One of the persistent challenges associated with IMIs and iCBT is the issue of dropout rates. The general umbrella review by Zhang et al. (2024) emphasized that high dropout rates impacted the overall effectiveness of IMIs, with unguided interventions being particularly prone to attrition. These findings highlight the importance of engagement strategies in digital mental health interventions, especially concerning a priori theoretical planning, Human-computer Interaction, Tailoring and targeting to user groups, and Active assessment of usage (Karekla et al., 2019; Kasinopoulos et al., 2023). Studies suggest that personalized reminders, interactive content, and blended care approaches (combining digital therapy with in-person support) may enhance adherence (Linardon et al., 2019; Torous et al., 2020). The need for patient engagement strategies is particularly relevant for conditions such as depression and addiction, where dropout rates tend to be higher.

Blended interventions represent a promising avenue for optimizing digital mental health treatments. Studies have found that blended iCBT for depression and anxiety is as effective as in-person therapy, with comparable therapeutic alliance ratings (Preschl et al., 2011; Kooistra et al., 2016). Moreover, therapist efficiency can be improved by using IMIs to reduce the number of required face-to-face sessions. For example, (Clark et al. 2023) found that iCBT achieved similar clinical outcomes while requiring only half the therapist's time, allowing clinicians to treat more patients within the same timeframe.

The current state of research on the cost-effectiveness of IMIs for mental health problems is promising but mixed, with several studies indicating potential benefits and others highlighting the need for further research. Internet interventions for mental health disorders, such as depression and anxiety, have shown favorable cost-effectiveness compared to traditional care, even if the results are still modest. A first meta-analysis on this topic (Rohrbach et al., 2023) found that these interventions were slightly more effective when compared with a do-nothing or care-as-usual approach, while a previous systematic review (Mitchell et al., 2021) indicated that 81% of internet interventions for anxiety and depression were cost-effective, although the studies varied in methodology and cost components. Moreover, guided internet interventions have stronger support in terms of cost-effectiveness than unguided ones (Kählke et al., 2022), even if there are studies showing that self-guided IMIs are most cost-effective in pain management (e.g., Dear et al., 2021). Thus, it seems that we need to be cautious and to avoid a one-size-fits-all answer to this question about the preferred mode of support when using IMIs. Much more research is needed in this area, sensitive to the specificities of the intervention and target groups. Another potential focus for IMIs is on maintaining recovery and relapse prevention. Mental health conditions have a high relapse rate, and any significant effect in reducing or delaying relapse is very impactful. A review of 16 RCTs found a small to medium effect on symptom severity in several mental health disorders (Hennemann et al., 2018). Most considered interventions were CBT-based for depression, eating disorders and transdiagnostic treatments.

Artificial Intelligence and Impact on IMIs

The use of artificial intelligence (AI) and machine learning (ML), which represents a subset of methods within the field of AI, is providing new opportunities in terms of mental

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health assessment, prevention, and promotion. The last decade has seen an ever-increasing use of ML for improving the prediction of clinical outcomes such as suicide (Burke et al., 2019), psychosis onset (Rezaii et al., 2019), postpartum depression (Saqib et al., 2021), treatment outcomes (Del Fabro et al., 2023), based on relevant risk and protective factors as well as more advanced digital and biochemical markers (Khoo et al., 2024). As the assessment of psychological processes has become more complex and has begun incorporating daily measures of symptoms of psychopathology (Wenzel et al., 2024), digital traces of human behavior (Bufano et al., 2023) and different wearable sensors (Gomes et al., 2023) to measure behavior, ML has for many become the go-to method for integrating this type of complex data into useful predictive models (Nguyen et al., 2023). More recently, the advent of large language models has given impetus for developing ML tools that harness the richness and depth of the human language, the use of complex language in online chatbots for mental health (Gallegos et al., 2024), and the assessment of psychological constructs using natural language (Kjell et al., 2024).

The advent of modern ML methods, including deep learning and large language models, has also contributed to societal change, both within society generally and within psychology more specifically. The use of ML within the context of crowd-sourced therapy is an example of the use of ML to promote greater involvement of individuals with lived experience of mental health issues and the development of mental health interventions. In an experiment conducted at the Michigan Institute of Technology (Rojas-Barahona et al., 2018), patients and therapists alike were invited to contribute ideas about the most helpful ways of restructuring specific negative automatic thoughts. As such proposals accrued, patients rated these suggestions and, in time, developed a database that could be used to train an ML model. This ML model then provided the backend for a mental health chatbot created by a community of patients and therapists. Examples such as these not only indicate that ML has the potential to make the mental health field more inclusive for people with lived experience but also show that it has the potential to upscale mental health interventions. More generally, building on the conceptual framework put forth by proponents of Process-Based Therapy (PBT), ML can help take advantage of the empirical data on the mediators and moderators in psychotherapy by tailoring it to the individual, thereby potentially increasing its impact, ensuring greater engagement, and extending its reach (Ciarrochi et al., 2024).

However, the use of ML in mental health also faces multiple and significant hurdles. As a recent review documented (Gutierrez et al., 2024), most researchers in the mental health field do not abide by the reporting standards set forth by the ML community (Collins et al., 2024; Kapoor et al., 2024). In addition, very few authors and ML developers provided evidence of the validity of their models in independent test sets not used to train and fine-tune their ML models. This is vital since the lack of such validation methods can lead to a significant overestimation of a model's accuracy. Furthermore, depending on the datasets used for training and model refinement, it can lead to bias in terms of gender, age, socio-economic status and/or race, with significant ethical implications for underserved communities. These issues have also been highlighted in recent EU legislation (EU AI Act – Regulation (EU) 2024/1689). Psychological applications of AI tools designated by the EU as medical devices and AI systems geared toward psychological assessment (e.g., AI systems intended to be used allocate tasks based on individual behavior or personal traits or to be used by public authorities to evaluate the eligibility of persons for essential public assistance benefits and services, including healthcare) are considered by the EU AI Act to be high-risk AI systems, with potential to adversely impact the fundamental rights of individuals. Such AI systems therefore require special provisions to ensure fairness and safety for vulnerable populations (e.g., children, people with intellectual disabilities, migrants). This is especially important with tools based on ML going from the academic research sphere to commercial application, or commercialization of ML tools without theoretical or therapeutic backing from professionals in the mental health field (Karekla et al., 2019)

Finally, one of the major hurdles in most current deep learning ML models is their opaqueness, precluding users from knowing why exactly a prediction has been made. The development of explainable artificial intelligence (XAI), aimed at developing methods to understand the workings of deep learning models post-facto (e.g., Local Interpretable Model-agnostic Explanations – LIME) (Linardatos et al., 2020; Kerz et al., 2023) seems to be one of the vital next avenues of research for using ML in the mental health field.

Privacy, Legal, and Ethical Challenges

IMIs should be used based on high-quality evidence that the intervention is adequate for the targeted population. Moreover, they need not cause harm, and we know that deterioration tends to be underreported in mental health interventions (Rozental et al., 2017). Thus, the development

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and implementation of IMIs pose significant ethical and legal challenges. On the one hand, IMI development implies following procedures that warrant client safety and compliance with legal requirements. On the other hand, it also creates issues regarding its role compared to traditional, face-to-face forms of intervention.

The European Union (EU) has introduced several regulations to protect the privacy and health of its citizens in the digital realm. Two key frameworks are the General Data Protection Regulation (GDPR; Regulation (EU) 2016/679, 2016) which ensures individuals' rights to access and control their personal data, and the Regulation (EU) 2024/1689 (Artificial Intelligence Act, 2024), which emphasizes transparency in the use of artificial intelligence and requires human oversight in AI decision-making processes. Together, these regulations aim to uphold high standards for digital services, also within mental healthcare.

The updated EU Medical Device Regulation EU MDR; Regulation (EU) 2017/745, 2017), which came into effect in 2021, contributed to making regulations governing digital health interventions and applications more stringent. Under this regulation, a large part of IMIs, if not all, can be classified as medical devices when they are intended for diagnosis, prevention, monitoring, treatment, or alleviation of diseases, and therefore, that regulatory framework imposes rigorous standards on the development and use of healthcare technologies across the EU. If considered medical devices, under this regulation, these interventions need to obtain CE marking, demonstrating compliance with the MDR's safety and performance requirements. This involves rigorous pre-market evaluation, including clinical data and post-market surveillance.

It is a concern that this regulation could negatively affect the development of European devices, making the process complex and expensive. Outside Europe, some countries have adopted alternative approaches to encourage innovation while maintaining safety and quality standards. For example, Australia has introduced a "conditional exemption" model for digital mental health interventions, allowing developers to bypass certain regulatory hurdles while adhering to mandatory clinical guidelines. As a response to these worries, various EU member states have developed national frameworks that build on the EU MDR, such as Germany's fast-track approval process for digital health apps, France's clinical evaluation guidelines for connected medical devices, and Finland's Digital Health Technology Assessment Framework (San Miguel et al., 2022).

Despite these advances, the regulatory environment poses significant challenges for developers of digital health solutions, particularly small-scale initiatives or academic projects that lack the resources to comply with the EU MDR or achieve CE certification. This situation is exacerbated by limited funding for the costly and time-consuming accreditation process, which often hampers the transition from research to full-scale deployment of effective digital health interventions.

However, even when IMIs meet legal and regulatory standards, ethical challenges remain. Key concerns include the role of automation in healthcare, whether digital technologies should supplement or replace traditional services, how to ensure equitable access for vulnerable populations, and whether these IMIs are based on solid theoretical and empirical evidence. Increasing regulation can create friction, particularly in reaching those with limited access to digital tools. In such cases, healthcare providers may resort to using widely accessible yet insecure platforms to maintain contact with patients, raising ethical questions about prioritizing communication over privacy.

Another ethical issue regards the side effects in psychological treatments, such as worsening of symptoms, and strains in family relations (Schermuly-Haupt et al., 2018). Although the *Primum non nocere* is an integral principle of ethical psychological practice, in studies reporting IMIs, negative effects are rarely reported. Therefore, a consensus on monitoring and reporting possible negative effects of internet-delivered interventions was reached (Rozental et al., 2014). Since then, reporting of negative effects in studies on IMIs increased significantly, with a large individual patient data meta-analysis showing that the likelihood of experiencing deterioration was 3.1 times greater in the control group compared to the ICBT group (17.4% vs. 5.8%) (Rozental et al., 2017). Nonetheless, data on the negative effects of IMIs used in routine care are lacking.

Another relevant topic has to do with the potential of IMIs to replace face-to-face interventions, and how that is desirable or not. The current evidence is not enough to sustain IMIs as the best solution for some more severe conditions, and IMIs are not the best way to deal with acute crises (Torous et al., 2018). Moreover, clients may prefer face-to-face interventions, and their preferences are key elements for successfully implementing mental health interventions. Thus, giving the patients the possibility of choosing seems the best option. These preferences also need to ensure that clients receive proper explanations of questions related to privacy and confidentiality, giving full consent for the way their data will be collected, managed and used (Smith et al., 2023). Finally, while IMIs can provide access to treatment in communities that do not have access to face-to-face therapy, it is still necessary to advocate for access to all available mental health treatment options (Muñoz et al., 2018).

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Implementation

Barriers to Implementation, Inequalities and Inclusion

Health Care Professionals' Attitudes

The implementation of IMIs always needs the collaboration of healthcare providers; as such, their attitudes are major elements that need to be considered. However, the attitudes vary with regional contexts and regulations. In Europe, for example, while a study in the UK revealed that 72% of general practitioners (GPs) used at least one e-mental health intervention for depression (Breedvelt et al., 2019), a recent survey in Portugal (Nogueira-Leite et al., 2023) revealed that only 43.6% of mental health professionals planned to recommend the use of digital means for their patients in the forthcoming 12 months, even if the most of them were favorable to such use (87.2%). It is interesting to notice that this favorable view in Portugal contrasts with a pre-pandemic national survey that showed lower acceptability of IMIs in this country (Mendes-Santos et al., 2020); in other words, the acceptance has grown following the pandemic, as expected. It is reasonable to expect that the same has happened in other countries; an increase in more favorable attitudes from the mental health professionals does not necessarily lead to wider use and implementation. In the US, for example, Kong et al. (2020) found that while many physicians were open to discussing health apps, most did not actively recommend them.

It is noteworthy, however, that the experience of wider use of IMIs does not eliminate specific concerns. The aforementioned study in the UK found that 92% of the GPs cited insufficient training as a major challenge (Breedvelt et al., 2019). The same was true in another study in New Zealand (Rawnsley & Stasiak, 2024), in which 81% of mental health clinicians reported having used digital tools, with 65% rating their knowledge as moderate or higher. While they acknowledged improved accessibility and patient empowerment, concerns remained about the digital divide and the risk of replacing traditional care. Most favored blended care and emphasized the need for secure, evidence-based, and user-friendly technologies to prevent exacerbating inequalities. The preference for blended formats was also found in a UK study by Breedvelt et al. (2019).

Győrffy et al. (2020) surveyed physicians in nine countries and found that while many saw digital tools as enhancing doctor-patient relationships, they felt patients benefited more than clinicians. They envisioned their future role as interpreters of digital data, helping patients navigate health technologies. In a comprehensive systematic review, Berardi et al. (2024) identified barriers and facilitators to adopting IMIs. Barriers include perceived impersonality, increased burden on providers and patients, and regulatory complexities, while facilitators include patient-centered approaches, evidence-based provider training, peer collaboration, and policy changes to ensure universal access.

Psychologists have also expressed the concern that while AI-powered tools may relieve some of the burdens brought on by the adoption of IMIs by helping tackle administrative tasks, increasing personalization and facilitating the interpretation of data, the use of such tools may also lead towards the deskilling of psychologists (Farmer et al., 2025). By reducing the requirements for psychologists to be familiar with the pertinent literature and to engage in critical thinking, AI-based tools could degrade professional practice standards. Using AI tools as part of IMIs without sufficient understanding of their algorithms, the data they are trained on, and the relevant field of clinical practice in which such tools are used could be professionally and ethically questionable, given that professional practice should be based on well-founded beliefs and scientific knowledge (Farmer et al., 2025).

In sum, there seems to be a tendency to accept IMIs, especially in blended formats. However, specific issues need to be addressed, and training and adequate workload seem pressing even in communities already using these devices.

Barriers and Facilitators of Engagement

Even when the initial uptake is high, obtaining long-term engagement with IMIs remains a challenge, both in RCTs and especially in real-life use, with only 3.3% of mobile app users active after 15 days (Baumel et al., 2019). A systematic review of 208 articles by Borghouts et al. (2021) highlighted common factors affecting engagement at user, program, technology, and environment levels.

Facilitators of use on the individual level range from digital literacy, positive experiences and attitudes towards technology and mental health seeking to the ease of integrating IMI into users' daily lives. Severe mental illness (SMI) can encourage interest in IMI use but also hinder sustained engagement due to symptoms (Kozelka et al., 2023).

At the program level, apart from the previously mentioned level of guidance, the type and relevance of the content are among the most robust engagement factors. Long and excessively complex content (Eccles et al., 2021) or lack of content variability (Balaskas et al., 2023) decreases engagement. Users consistently favor IMIs that offer the possibility of personalized content, tailoring it to their symptoms, preferences, etc. (Balaskas et al., 2023; Borghouts et al., 2021; Jackson et al., 2024).

On the technology level, technical issues drive users away, while intuitive and aesthetically appealing designs improve retention. Design preferences vary; some favor gamified approaches, while others prefer direct, structured

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formats (Fleming et al., 2019). Environmental factors refer to the context of IMI implementation and may either promote its use, such as the availability of IMI training, which tends to foster adherence, or create obstacles, such as organizational and administrative barriers to engagement. Thus, these factors also need to be considered when implementing IMIs.

Often subsumed under user- or human-centric design, co-design, or participative design, involving end users in IMIs' design is considered the best way to ensure relevance and satisfactory engagement (The Wellcome Trust, 2024). However, this is still a critical issue, as most RCTs only include post hoc satisfaction surveys (Sin et al., 2020) or do not report on the method of user engagement (Bergin et al., 2020; The Wellcome Trust, 2024). Ideally, developers should aim to co-design IMIs with people with lived experience through an iterative process that starts as the first step towards designing an IMI and continues into implementation. Alternatively, end users and care providers should be included in choosing, adapting and implementing an existing IMI in a healthcare setting (Liu & Schueller, 2023). Developing a co-design approach becomes even more critical in reaching marginalized communities.

Digital Health Equity

With the rise of IMIs, the matter of equity is becoming increasingly significant. Various populations worldwide have been facing systemic inequalities in mental health, e.g., racial, ethnic and religious minorities, rural communities, low-income individuals, gender and sexual minorities, and low- and middle-income countries (WHO, 2022). IMIs are seen as a potential means to reduce these disparities by offering quality treatment regardless of physical location, costing less than face-to-face therapy, and ensuring privacy (as stigma often acts as a barrier to seeking treatment).

However, IMIs may also exacerbate inequities because of the digital divide, i.e., unequal digital access and literacy, and varying attitudes towards technology use. Digital barriers to mental health treatment often align with pre-existing social barriers, meaning paradoxically, those who are most in need of mental health intervention are often least likely to be reached by or benefit from IMIs.

Notwithstanding digital barriers, IMIs are still not meeting their potential regarding underserved communities. Promising results are available, with standard and especially with specifically designed or adapted IMIs (Piers et al., 2023; Schueller et al., 2019), but these communities are rarely the focus of IMI developers. First, data on the effectiveness of standard IMIs in marginalized groups are limited, as they are commonly not included in RCTs or sample characteristics such as ethnic identity or socioeconomic status are not reported (De Jesús-Romero et al., 2024; Kirvin-Quamme et al., 2024). Most RCTs are conducted in Western high-income countries, possibly limiting the generalisability to other countries (Karyotaki et al., 2023).

Secondly, there is a shortage of IMIs designed for or adapted for a specific community (Schueller et al., 2019). Standard IMIs are sometimes inefficient in marginalized communities (Bear et al., 2024). To be made relevant, IMIs need to include pertinent content to the lived experience of these communities, e.g., particular stressors and living situations of refugees (Spanhel et al., 2019), types of activities available to low-income and homeless people, or specific themes relevant to gender and sexual minorities. Members of ethnic minorities point to the importance of culturally appropriate and relevant content, including names, characters' backgrounds, activities, traditions, values and cultural definitions of mental health and illness (Kaihlanen et al., 2022; Piers et al., 2023; Wilson et al., 2024). Ideally, members of marginalised communities should be partners in a context-centric and collaborative design of IMIs that draw upon their expertise and agency, and should have increased power over the entire process and its outcomes (Friis-Healy et al., 2021; Kozelka, et al., 2021; Kuhn et al., 2024).

In conclusion, it is unrealistic to expect IMIs to reduce the mental health gap unless they are explicitly oriented towards equity (Kuhn et al., 2024). That means conscious, deliberate, and strategic inclusion and focus on marginalised communities (Ramos et al., 2024).

Paradoxically, those most in need of mental health intervention are often those least likely to benefit from such efforts, as evidenced by a recent review of social disparities in the use of telehealth interventions (Badr et al., 2024). Furthermore, future use of IMI's based on large language models could also entrench existing biases and stereotypes, leading to unintended adverse mental health effects of IMIs (Timmons et al., 2023).

IMIs in Routine Care

When it comes to implementation, more and more countries have public digital mental health services (e.g., Denmark, Australia, the UK, Germany, France, Sweden), where the care implemented in the clinics goes hand in hand with well-researched IMIs, as these services often consist of a research department and one or more clinics implementing the different IMIs.

In the past 10 years, a lot of private companies have entered the market of IMIs (e.g., Stoeckl et al., 2023) (for instance, HelloBetter in Germany, SilverCloud from the UK, We.Care in Denmark, BetterHelp and Talkspace in the United States, and many more). It is not always clear whether the different IMI solutions by private companies are empirically supported (Koh et al., 2022). Other important information, such as cost, privacy policy or accessibil-

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ity, is also not readily available. In an effort to guide potential users and care personnel to accessible, safe, and effective IMIs and to help them make informed decisions, some countries have a publicly funded website that grades the publicly available IMIs, such as the mHealth Index & Navigation Database (https://mindapps.org/). This website, based on the American Psychiatric Association's App Evaluation Model, allows filtering of apps based on cost, features, privacy, supported conditions and treatment approaches and also provides information on accessibility, clinical evidence, user experience, helpfulness in emergencies, etc. However, when in need of care, a client/patient does not necessarily have the energy or mental capacity to find such a website to read about different IMIs and find the best one.

Despite lacking transparency or being empirically supported, a perspective to consider is that several private businesses providing IMIs succeeded in attracting a large number of clients and, therefore, can potentially provide large data sets. Based on these large data sets, a company would be able to calculate effect sizes and show effectiveness, for instance, to improve treatments. Since this is not always a priority or financially viable for the company, the data might not be collected thoroughly or might be left unused.

One important consideration is that IMIs are often integrated into stepped care provision of services with other types of interventions. Such integration improves the effectiveness of the overall response (e.g., Jagayat et al., 2024), harnessing the advantages of each intervention. Digital low-intensity interventions with a focus on self-management can significantly extend the capability of health services, while more intensive in-person interventions can respond to individuals with adherence issues or to those who require other types of intervention (Espie & Henry, 2023). Integrating different interventions (digital or not) according to purpose or client needs implies addressing questions other than the effectiveness of an intervention. Namely, who benefits from which interventions and what are the predictions for stepping up when the IMIs are integrated into a stepped-care approach (Nicholas et al., 2019).

General Discussion

The present review provides an updated overview of the current state of IMIs, including discussion of the latest advances, issues, and consequences for clinical practice. Over the last few years, IMIs have greatly developed, especially due to the improvement of technologies, growing evidence of effectiveness, and changing needs in society and healthcare. Since the previous EFPA report (Ebert et al., 2018), support for the efficacy of IMIs has grown markedly, although research remains concentrated on depression and anxiety, leaving several clinical areas unexplored. Moreover, marginalized groups, children and older adults are also underserved in this regard. The same can be said about therapeutic approaches. Although more diverse treatment approaches are being studied, most studies focus on CBT.

Across the literature, several recurring patterns help clarify both the strengths and limitations of IMIs and their implications for clinical practice. One consistent observation concerns the role of therapist involvement. Unguided interventions offer flexibility and scalability but often show limited therapeutic depth and low adherence, making them more suitable for prevention or for individuals with mild symptomatology when complemented by robust engagement strategies. Interventions that include some form of professional input, whether minimal or more structured, tend to produce higher adherence and more reliable clinical improvements, suggesting that even low-intensity guidance can significantly enhance outcomes while remaining feasible for routine care. Blended formats appear especially valuable for more severe or complex presentations and align well with stepped-care approaches.

A second recurring pattern relates to the intensity of support. Although current evidence is insufficient to determine the optimal level of guidance, existing findings indicate that matching support to clinical need is more important than relying exclusively on highly specialized providers, an insight with clear implications for scalability and workforce planning. Differences also emerge between interventions designed for prevention and those aimed at treatment. Preventive IMIs generally produce small-to-moderate effects, whereas treatment-focused IMIs are more established and demonstrate effectiveness across multiple disorders, despite high dropout rates and weaker outcomes for personality disorders. Across both domains, tailoring of content and sustained user engagement consistently stand out as critical determinants of success.

Another emerging trend in this field is the increasing integration of artificial intelligence into IMIs. Nonetheless, major issues such as data protection, artificial intelligence bias, and legal frameworks are still present. Additional research is therefore needed to clarify the ethical implications of using AI in psychological interventions, particularly when considering the potential involvement of intelligent agents in mental health care.

Beyond the challenges associated with AI, several broader implementation barriers persist. Distrust among healthcare professionals, together with ongoing digital divide issues, continues to limit the adoption of IMIs. Policy constraints also pose some difficulties to innovation, especially for small developers. Addressing the digital divide will require culturally appropriate and user-friendly design to

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ensure interventions are accessible to diverse populations. Future work should also consider long-term effectiveness, conduct head-to-head comparisons between different interventions, and include cost-effectiveness analyses.

In order to overcome all these challenges, it is crucial to continue cooperation between researchers, clinicians, users, policymakers, and IT stakeholders. While there is no doubt that IMIs can already be considered as a valued resource to deal with mental health issues, in various formats, there are research and implementation challenges that must be addressed to enable a wider, large-scale use of these tools in clinical practice.

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