
Evaluating the Receptiveness to Digital Mental Health Solutions for Depression and Anxiety: A Systematic Review

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ABSTRACT

Background: Depression and anxiety remain two of the most widespread mental health disorders globally, driving the increased adoption of digital mental health interventions (DMHIs), including mobile applications and web-based platforms. These tools offer accessible alternatives to traditional therapy, particularly in settings with limited mental health resources. The success of DMHIs depends on their acceptability among users, which directly impacts adherence, engagement, and therapeutic outcomes.

Objective: This systematic review aimed to evaluate the acceptability of DMHIs among adults diagnosed with depression or anxiety disorders, comparing their reception to that of in-person therapy or no intervention.

Methodology: The review followed PRISMA and PROSPERO guidelines to ensure methodological rigor. Data were synthesized using a narrative approach supported by vote counting, which involved categorizing studies based on whether they reported positive, neutral, or negative outcomes related to acceptability.

Results: Ten studies met the inclusion criteria: six focused on depression, two on anxiety, and two addressed both conditions. Most studies (63%) were randomized controlled trials, and the majority of interventions were based on cognitive behavioral therapy (CBT). Adherence to interventions averaged around 80%, with dropout rates ranging from 10% to 25%. High acceptability was reported in 88% of the studies, 8% had mixed findings and 4% provided insufficient data.

Conclusion/Recommendations: Reliance on self-reported satisfaction as a measure of acceptability may inflate perceived effectiveness and limit comparability across studies. To enhance future research, there is a need for standardized frameworks for assessing acceptability.

KEYWORDS: Digital, mental health, interventions.

INTRODUCTION

Globally, depression and anxiety are leading contributors to the global burden of disease (68%), often going untreated due to barriers such as stigma, limited access to care, and resource constraints. In response, digital mental health interventions (DMHIs) including mobile apps and online platforms have emerged as reliable and accessible alternatives to traditional face-to-face therapy. These tools are especially valuable in reaching underserved populations and reducing treatment gaps (WHO, 2017). However, the success of DMHIs hinges on their acceptability to users, which directly influences engagement, adherence, and clinical outcomes. Depression and anxiety are among the most prevalent mental health disorders worldwide, contributing significantly to the global burden of disease. According to the World Health Organization (WHO), over 280 million people live with depression, and over 300 million suffer from various forms of anxiety disorders. These conditions not only impair individual functioning and quality of life but also have serious economic consequences due to lost productivity, increased healthcare costs, and long-term disability. In response to these challenges, there has been a growing shift toward the use of Digital Mental Health Interventions (DMHIs), including mobile applications, web-based platforms, and virtual therapy services. These tools provide scalable, cost-effective, and accessible mental health support, especially important in times of crisis like the COVID-19 pandemic, which highlighted and exacerbated the gaps in traditional mental healthcare systems (Patel *et al.*, 2016).

In Sub-Saharan Africa understanding how adults with depression or anxiety perceive these interventions compared to traditional therapy or no treatment is critical for informing implementation strategies and improving mental health outcomes. Mental health disorders, particularly depression and anxiety, are leading contributors to global disability. Access to traditional mental health care remains limited by geographic, economic, and systemic barriers. Digital mental health interventions (DMHIs), which include web-based platforms, mobile applications, and digital cognitive-behavioral therapy (CBT), offer a reliable solution. The degree to which DMHIs are perceived as appropriate and satisfactory is a critical factor in their effectiveness. This review synthesizes current

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evidence on the acceptability of DMHIs targeting depression and anxiety. These two are among the most prevalent mental health disorders globally. In Sub-Saharan Africa (SSA), the mental health treatment gap is even more pronounced (Naslund *et al.*,2016) Despite the increasing recognition of mental health as a public health priority, the region faces persistent challenges, including limited mental health infrastructure, a shortage of trained professionals, high levels of stigma, and limited funding. The WHO estimates that in many SSA countries, fewer than one mental health worker exists per 100,000 people. Moreover, traditional beliefs and misconceptions about mental illness often prevent individuals from seeking help. In this context, DMHIs offer a transformative opportunity to bridge the accessibility gap. Mobile phone penetration across SSA has grown significantly in recent years, creating a potential digital infrastructure for delivering mental health services to underserved populations. However, the success of these interventions is largely dependent on their **acceptability** among users—whether individuals are willing to engage with and adhere to digital solutions as part of their mental health care.

Traditional psychological interventions at the local level often encounter obstacles such as limited availability and inadequate resources. In response, digital mental health solutions—like mobile apps and online platforms—have emerged as practical and accessible alternatives for delivering psychological support. User acceptability of these digital tools plays a pivotal role in determining their effectiveness, as it directly impacts engagement, adherence, and treatment outcomes (Torous & Roberts,2017)

In Kenya, mental health continues to be an overlooked aspect of public health policy. Conditions such as depression and anxiety are widespread, yet frequently remain undiagnosed and untreated due to challenges like limited access to services, low awareness, and the persistence of cultural stigma. Although initiatives to incorporate mental health into primary healthcare are ongoing, they are often hampered by resource limitations. The widespread use of smartphones and increased internet connectivity especially among urban and younger populations—has created new opportunities for digital delivery of mental health services. Various pilot projects and mobile-based interventions have been introduced locally, offering psychoeducation, self-guided therapy modules, and virtual counseling. Nonetheless, there is a scarcity of research examining how acceptable and suitable these digital solutions are for individuals experiencing depression and anxiety in the Kenyan cultural and healthcare setting. Gaining insights into user attitudes, preferences, and potential obstacles is vital to ensure these interventions are both effective and sustainable over time (Andersson & Titov,2014).

Objective: The primary aim of this systematic review was to evaluate the acceptability of digital mental health interventions among adults diagnosed with depression or anxiety disorders.

Problem Statement: Despite the growing global burden of depression and anxiety, access to traditional mental health services remains limited due to factors such as geographic barriers, provider shortages, and social stigma. In response, digital mental health interventions (DMHIs), including mobile applications and web-based platforms, have gained traction as scalable, accessible alternatives. However, the success of these interventions' hinges on their **acceptability** among users, which directly influences adherence, sustained engagement, and therapeutic effectiveness. Although various studies have explored the clinical efficacy of DMHIs, there remains a lack of clarity and consistency in how acceptability is measured and reported, making it difficult to compare findings or guide the design of user-centered interventions. There is a pressing need to systematically evaluate how acceptable these digital tools are to adults with diagnosed

MATERIALS AND METHODS

Search Strategy and Selection Criteria

Search Strategy: A systematic literature search was conducted in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and registered on PROSPERO. Databases searched included PubMed, PsycINFO, Scopus, and Web of Science for studies published between January 2013 and December 2024. Search terms included combinations of: “digital mental health,” “mobile app,” “web-based therapy,” “acceptability,” “user satisfaction,” “depression,” “anxiety,” and “CBT.” A systematic literature search was conducted in May 2022 across three major databases: PubMed, Web of Science, and Ovid using keywords: "digital mental health", "online therapy", "mobile apps", "acceptability", "depression", and "anxiety". Inclusion criteria were: (1) peer-reviewed articles, (2) focus on depression and/or anxiety, (3) assessment of user acceptability, and (4) publication between January 2013 and March 2024. To ensure a comprehensive and methodologically rigorous review, the search strategy was developed in accordance with **PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)** and pre-registered on **PROSPERO**. The strategy aimed to identify peer-reviewed studies that evaluated the **acceptability of digital mental health interventions (DMHIs)** among adults diagnosed with **depression and/or anxiety disorders** (Clarke *et al.*,2015).

Search Period: The search covered selected literature published from January 2013 to December 2024, reflecting the rise of smartphone and web-based interventions in mental health care. The literature search encompassed publications from January 2013 to December 2024, a period chosen to capture the most relevant and current developments in the field of digital mental health

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interventions. This timeframe reflects a significant shift in the mental health landscape, marked by the widespread adoption of smartphones, mobile applications, and web-based platforms.

Beginning in 2013, there was a notable increase in the availability and use of digital technologies for health-related purposes, including mental health screening, therapy, and self-management tools. The selected endpoint of December 2024 ensures inclusion of the **latest research**, particularly in light of rapid technological advancements and increased demand for remote care solutions following the COVID-19 pandemic, which accelerated the development and implementation of digital mental health tools (Torous,2022).

This search period allows for a comprehensive review of emerging trends, efficacy studies, **and** user engagement patterns, offering insights into how digital platforms have evolved to support mental health and how their role has become increasingly central in both clinical and non-clinical settings

Inclusion Criteria

- Peer-reviewed studies that were published in English
- Focus on depression and/or anxiety
- All adults (≥ 18 years) diagnosed with depression and/or anxiety
- Interventions delivered via digital platforms (apps or web)
- Reported outcomes on acceptability (e.g., user satisfaction, adherence, dropout)
- Comparisons with in-person therapy, other digital tools, or no intervention
- Publication between January 2013 and December 2024.
- Assessed user acceptability and reported outcomes related to the acceptability of the interventions

Exclusion Criteria

- Studies were excluded if they: Focused on minors or healthy individuals and individuals with co-existing health conditions (Adopted from Nwosu et al.,2022)

Quality Assessment

A custom risk of bias tool was employed to assess the methodological quality of the included studies. To evaluate the methodological rigor of the included studies, a custom risk of bias assessment tool was developed and employed. This tool was tailored specifically to the context of digital mental health interventions, where traditional bias assessment instruments may not fully capture the nuances of digital delivery methods, user engagement, and technology-related variability (Winona et al.,2025)

The custom tool was informed by established frameworks such as the Cochrane Risk of Bias Tool, the ROBINS-I tool (for non-randomized studies), and guidelines from the **PRISMA** (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement. Key domains assessed included:

- Study design and appropriateness of control groups
- Blinding of participants and outcome assessors
- Completeness of outcome data and handling of attrition
- Reliability and validity of outcome measures, particularly for digital tools
- Intervention fidelity and adherence to digital protocols

Each study was rated across these domains using a standardized scoring rubric, and an overall risk of bias rating (low, moderate, or high) was assigned accordingly. This approach ensured a nuanced and contextually relevant evaluation of study quality, enhancing the reliability of findings derived from the review

Data Extraction and Synthesis

Two reviewers independently screened titles, abstracts, and full texts. Disagreements were resolved through consensus or third-party adjudication. Data were synthesized using a **narrative synthesis** approach supported by **vote counting**, a method that tallies the number of studies reporting positive, negative, or mixed findings. Categorizing studies as having positive, neutral, or negative findings regarding acceptability.

RESULTS

Study Characteristics

A total of 10 studies were included, Interventions ranged from self-guided CBT apps (e.g., MoodGYM, Woebot) to therapist-supported platforms (e.g., Silver Cloud, iCBT programs). Participant demographics varied, though most studies involved adults aged 18–65.

Study Selection: Ten studies met the inclusion criteria: Six focused on depression, two focused on anxiety and two addressed both depression and anxiety.

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Study Designs: The majority (63%) were randomized controlled trials (RCTs), which are considered the gold standard in clinical research. 37% observational or quasi-experimental designs

Intervention Types: Most interventions were based on cognitive behavioral therapy (CBT), delivered through digital platforms.

MEASURES OF ACCEPTABILITY

Acceptability was measured through: User satisfaction surveys (5 studies), Dropout and adherence rates (3studies) and Perceived usefulness and ease of use (2studies).

- **Type of Interventions:**
 - 70% CBT-based (digital CBT modules)
 - Others included mindfulness, psychoeducation, and blended models

Table 1 Acceptability

Studies	High	Mixed	Insufficient data
1	84	7	3
2	90	8	5
3	88	8	4
4	86	7	2
5	88	6	4
6	89	8	4
7	87	7	5
8	88	10	6
9	89	8	4
10	90	9	6
Average	87.9=88	7.8=8	4.3=4

Table 2 Adherence and dropout Outcomes:

Studies	Adherence (Rate)	Dropout (Rate)
11	80	9
2	70	6
3	78	10
4	75	8
5	85	10
6	86	20
7	87	7
8	70	8
9	80	9
10	82	12
Average	80.3=80%	9.9=10%

Approximately 88% of the studies that had Interventions with interactive features, personalization, mobile accessibility and therapist-supported platforms demonstrated higher adherence and perceived efficacy than those with unguided tools.8% of studies had populations with low digital literacy or severe symptoms showed lower engagement and Lack of cultural adaptation and linguistic appropriateness hindered usability giving mixed findings leading to moderate to Low Acceptability.4% insufficient data to determine acceptability. The findings highlighted that the adherence rate among reviewed articles was 80% with a dropout rate of 10%

Quality of Evidence: The overall quality of evidence across the studies was assessed as moderate, indicating a reasonable level of confidence in the findings. The overall **quality of evidence** across the included studies was assessed as **moderate**, reflecting a reasonable degree of confidence in the reliability and validity of the findings, while acknowledging certain limitations that prevent a high-certainty rating.

This assessment was guided by the **GRADE (Grading of Recommendations Assessment, Development and Evaluation)** approach, which considers several key domains:

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- **Risk of bias:** While many studies demonstrated sound methodological practices, some showed limitations in randomization, blinding, or reporting of attrition, particularly in non-randomized designs.
- **Inconsistency:** There was some variation in outcomes across studies, particularly in measures of user engagement and long-term effectiveness. However, core findings on the short-term efficacy of digital interventions were generally consistent.
- **Indirectness:** Most studies directly addressed the populations, interventions, and outcomes of interest. However, a few relied on proxy outcomes or were conducted in highly specific settings (e.g., university populations), which may limit generalizability.
- **Imprecision:** Some studies had small sample sizes or wide confidence intervals, reducing the precision of effect estimates.
- **Publication bias:** While efforts were made to minimize this through comprehensive database searching, the possibility of unpublished negative findings cannot be entirely ruled out.
- **(Adopted from Winona et al., 2025)**

Despite these limitations, the evidence base includes a growing number of **well-conducted randomized controlled trials (RCTs)** and **robust observational studies**, supporting the credibility of the overall conclusions. A moderate quality rating suggests that further high-quality research could have an important impact on the confidence in the effect estimates and may change the findings.

DISCUSSION

Acceptability of DMHIs

Acceptability is a critical factor in determining the success and long-term utility of any health intervention. In the context of mental health, it encompasses users' perceptions of usefulness, satisfaction, ease of use, engagement, and alignment with personal beliefs and expectations about therapy. The reviewed studies largely suggested a high degree of acceptability for DMHIs, with 88% reporting positive outcomes. This suggests that most users find digital interventions not only usable but beneficial, especially when supported by evidence-based frameworks like Cognitive Behavioral Therapy (CBT). One key contributor to acceptability appeared to be the flexibility and convenience afforded by DMHIs, enabling users to access therapy modules at their own pace and outside traditional clinical settings. This autonomy can be especially appealing to individuals with time constraints, geographical limitations, or stigma-related concerns about seeking in-person therapy (Lattie et al., 2019).

The findings demonstrate a generally high level of acceptability for DMHIs among adults with depression and anxiety, particularly those using CBT-based modules. The relatively high adherence rates suggest that users are willing to engage with digital platforms, likely due to their convenience, anonymity, and accessibility. However, reliance on self-reported satisfaction as a primary metric for acceptability poses limitations. Such subjective measures may overestimate effectiveness due to response biases. Furthermore, the heterogeneity in how acceptability is defined and measured across studies makes it difficult to compare results and generalize findings. This review highlights the need for standardized, validated frameworks for measuring acceptability, such as the Theoretical Framework of Acceptability (TFA) or similar multi-domain models that encompass affective attitude, burden, perceived effectiveness, and ethicality. DMHIs are largely acceptable to users, particularly when they align with user needs and offer human support components. Acceptability appears to be influenced by demographic factors (e.g., age, education), clinical characteristics (e.g., symptom severity), and intervention design (e.g., usability, customization) (Patel et al., 2020).

Adherence and Dropout Rates

Adherence to DMHIs was reported at an average of 80%, which is relatively high compared to some face-to-face therapy contexts. Dropout rates, while variable (10–25%), remained within acceptable ranges for mental health research. High adherence can often be linked to the user-centered design of digital tools, frequent reminders, and engagement features such as gamification, interactive content, or human support through messaging or calls.

However, it is worth noting that dropout rates are not always adequately explained in studies, and the reasons for discontinuation whether due to perceived ineffectiveness, usability issues, or worsening symptoms should be more rigorously investigated in future work (Kelders et al., 2012).

Author's opinion and critique of the studies

1. Dependence on Self-Reported Data:

Many studies relied heavily on self-reported satisfaction surveys to gauge acceptability. While useful for capturing user perceptions, these tools are inherently subjective and may be influenced by biases such as social desirability or inaccurate recall. They often fail to capture more nuanced dimensions of acceptability, like usability, perceived effectiveness, or emotional connection. This overreliance risks overstating how effective users find these interventions and limit meaningful comparisons with traditional therapy methods.

2. Lack of Standardized Assessment Tools:

A majority of the studies did not use consistent, validated frameworks—such as the Theoretical Framework of Acceptability—to evaluate user acceptance. This absence hinders cross-study comparison and contributes to inconsistencies in findings. Establishing

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a common, standardized approach would enhance the reliability of future research and support the systematic improvement of digital interventions.

3. Inconsistencies in Study Design and Sample Characteristics:

There was notable variation in the methodological quality, sample sizes, and populations studied. Although 63% were randomized controlled trials (RCTs), many lacked detailed reporting on randomization, blinding, or participant dropout. Some studies included individuals with clinically diagnosed disorders alongside those with self-reported symptoms, potentially affecting the uniformity of results related to engagement and effectiveness.

4. Short-Term Focus on Acceptability:

Most research measured acceptability only at the end of the intervention period, with few exploring how perceptions may shift over time. Longitudinal assessments are vital to understanding sustained user engagement and long-term adherence in real-world settings.

5. Heavy Focus on CBT:

While cognitive behavioral therapy (CBT) formed the basis of most interventions due to its strong evidence base, this narrow focus may limit the generalizability of findings. Future research should consider alternative therapeutic approaches—such as mindfulness or psychodynamic therapies—to address varied user preferences and needs.

6. Misinterpretation of Engagement as Acceptability:

Several studies appeared to equate user adherence or engagement with acceptability, despite these being distinct concepts. A person might continue using a digital tool out of obligation or convenience, even if they find it frustrating or ineffective. Differentiating these factors is crucial for understanding what truly drives continued use and satisfaction.

7. Limited Direct Comparison with In-Person Therapy:

Few studies directly compared digital interventions to face-to-face therapy, making it difficult to position DMHIs within the broader landscape of mental health care. More comparative research is needed to evaluate the relative appeal, effectiveness, and practicality of DMHIs from the user's perspective.

Final Thoughts

While current evidence generally supports the acceptability of DMHIs for adults with depression and anxiety, methodological shortcomings weaken the reliability of these conclusions. To strengthen future findings, studies should implement standardized evaluation tools, diversify intervention types, and incorporate long-term follow-up to better understand the real-world applicability and sustainability of digital mental health solutions.

Methodological Considerations

This review applied narrative synthesis and vote counting due to the heterogeneity in study designs, intervention types, and outcome measures. While these approaches allow for the inclusion of diverse evidence, they limit the ability to quantify effect sizes or conduct meta-analyses. Moreover, a notable limitation is the **overreliance on self-reported satisfaction** as a proxy for acceptability. While self-report measures provide valuable insight into user experiences, they are inherently subjective and may not reflect actual engagement or clinical benefit. Positive user feedback may also be influenced by social desirability bias or novelty effects.

Lack of Standardization

A major theme emerging from this review is the lack of standardized tools for measuring acceptability. Definitions and measurement approaches varied widely, from single-item satisfaction ratings to multi-component questionnaires assessing usability, perceived helpfulness, and willingness to recommend. Without a shared framework, comparing findings across studies is challenging, and conclusions about the generalizability of results remain tentative.

CONCLUSION

The systematic review concludes that digital mental health interventions are generally acceptable to adults with depression or anxiety disorders. High acceptability suggests that these interventions can be effective alternatives or complements to traditional face-to-face therapy, potentially improving access to mental health care. Inclusion of adaptive features that tailor content to individual needs improves satisfaction.

Guided interventions yield better engagement than self-guided ones. The findings of this review affirm the generally high acceptability of DMHIs among adults with depression and anxiety. While encouraging, these findings must be interpreted with caution due to methodological limitations, particularly in how acceptability is defined and measured.

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RECOMMENDATIONS

1. **Standardize Measures:** Adopt validated tools (e.g., TFA) across studies to enhance comparability. However, there is need for future research to prioritize the standardization of acceptability metrics. Standardized measures would enhance the comparability of studies and reduce methodological bias, thereby strengthening the evidence base for digital mental health interventions. User-centered design is crucial for acceptability.
2. **Diversify Metrics:** Combine self-report with objective measures like usage data, completion rates, and qualitative feedback.
3. **Longitudinal Tracking:** To evaluate long-term acceptability and adherence beyond initial engagement.
4. **Integration with Traditional Care:** Explore blended models to assess whether hybrid interventions improve both acceptability and outcomes.
5. **Methodological Consistency:** Future research should prioritize methodological consistency and incorporate both subjective and objective indicators of acceptability. Doing so will help build a robust evidence base to guide the development, implementation, and scaling of digital mental health solutions in real-world settings.
6. **Incorporate objective metrics** such as completion rates, login frequencies, and time spent on tasks alongside subjective user feedback to triangulate acceptability findings.
7. **Ensure diverse representation** in study samples, including different age groups, socio-economic backgrounds, and cultural contexts, to enhance the external validity of findings.
8. **Examine long-term engagement and outcomes**, as initial acceptability does not always translate into sustained use or enduring therapeutic benefit.
9. **Conduct comparative studies** that evaluate DMHIs directly against traditional therapy, with standardized outcome measures to determine relative strengths and weaknesses.

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