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Original Research Paper

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USAGE OF MOBILE APPLICATION IN MENTAL ILLNESS AMONG INDIAN POPULATION

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INTRODUCTION

Globally, in 2019, it was estimated that nearly 293 million individuals aged 5 to 24 years had at least one mental disorder, and 31 million had at least one substance use disorder (SUD).

The mean prevalence was 11.63% for mental disorders and 1.22% for SUDs (1). In India, 14.3% of the total population is affected by mental disorders (2). Additionally, mental disorders contributed to 4.7% of the total disability-adjusted life years (DALYs) in India in 2017, a significant rise from 2.5% in 1990 (2).

Recently, mobile applications (apps) have emerged as significant tools for managing and monitoring mental health, offering accessibility and convenience that traditional healthcare methods often lack (3). Mental illness in India is a critical public health concern, with a substantial proportion of the population affected by anxiety, depression, substance use disorders, and other psychiatric conditions. However, despite this high prevalence, there remains a significant treatment gap due to multiple barriers, including stigma, lack of awareness, limited mental healthcare facilities, and a shortage of trained professionals (4).

The use of mobile-based mental health screening and counseling applications is increasing(5). Additionally, studies indicate high mobile phone penetration among Indians, suggesting a strong potential for digital health interventions (6). Research from Western countries (Hall et al., 2015) (7) and India (8) highlights the effectiveness and acceptability of SMS-based interventions in healthcare delivery. Given this, mental health apps tailored to the Indian population could serve as valuable tools in bridging the treatment gap, offering self-help resources, therapeutic interventions, and symptom monitoring. Furthermore, these apps can aid in continuous patient support, early detection, and timely intervention.

This review presents an overview of mental health applications in India, analyzing usage patterns, effectiveness, and user perceptions. We systematically reviewed the literature on mobile mental health applications in India to provide insights into their feasibility, accessibility, and potential impact on mental health care

2. Methodology

2.1 Search Strategy

A systematic review was conducted using PubMed and Google Scholar, focusing on the search terms "Mobile Apps" "Mental Illness" and "India"

The search was completed in May 2024, covering studies published in the last five years (2019–2024). A total of 46 articles were identified in PubMed, while 41,200 articles were retrieved from Google Scholar (14).

2.2 Inclusion and Exclusion Criteria

After applying exclusion criteria, including studies related to gaming apps, telepsychiatry, smartwatch-based interventions, COVID-19-related research, and studies involving multiple countries alongside India, 65 relevant articles were selected for review (14). Among these, 25 were review articles, 30 were original research articles, and 10 focused on therapy-related topics.

2.3 Data Extraction and Categorization

The articles were categorized based on study design and relevance to mobile health applications for mental illness in India. The review included studies that assessed the feasibility, effectiveness, and user perception of mental health apps, as well as those focusing on specific psychiatric conditions and intervention approaches (14).

3. Review of Literature

3.1 Feasibility and Acceptance of Mental Health Apps

Most reviewed studies indicated that mobile applications for mental illness are both feasible and widely accepted (8). The increasing use of smartphones and digital health tools has made mental health interventions more accessible, particularly in areas with limited mental health professionals and infrastructure. However, while mobile health applications have gained popularity, research on their long-term efficacy, usability, and integration into formal healthcare systems remains limited (9).

3.2 Common Psychiatric Conditions Addressed by Mental Health Apps

The majority of mobile apps analyzed in the reviewed studies

focused on depression, anxiety, stress, bipolar disorder, PTSD, panic disorder, sleep disorders, schizophrenia, OCD, and substance use disorders, including alcohol and drug addiction. Additionally, some apps were designed to address internet addiction, general mental health, and emotional well-being. These apps primarily provide self-help interventions, psychological education, and symptom-tracking tools (8).

3.3 Intervention Approaches in Mental Health Apps

The reviewed literature identified several key intervention approaches utilized by mobile health applications. These include relaxation techniques such as guided breathing and progressive muscle relaxation, stress management tools, symptom tracking, calming audio therapy, journaling, peer support networks, guided meditation, and mood monitoring (8).

Many apps also incorporate cognitive behavioral therapy (CBT)-based self-help modules, psychoeducation, and interactive engagement tools to enhance mental health outcomes(13). Despite these innovations, most applications remain underdeveloped in terms of personalization, cultural adaptation, and long-term engagement strategies (9).

3.4 Mobile Phone Penetration and Digital Health Trends

Global statistics indicate that there are 2.71 billion smartphone users worldwide, with half residing in Asia (9). The Asia-Pacific region ranks first in mobile data consumption, highlighting the potential for mobile-based mental health interventions (9). However, despite high mobile phone penetration, many individuals in impoverished settings, rural communities, and marginalized groups remain without access to digital mental health resources. Several studies emphasized that women in India have lower access to mobile devices than men, further exacerbating the digital divide in mental healthcare (10).

Additionally, governmental policies and strict regulations on telecommunications in some regions limit internet accessibility, affecting mobile health interventions (10).

4. RESULTS

4.1 Impact of Mobile-Based Mental Health Interventions

The studies reviewed indicate that mobile-based mental health interventions have led to an increase in help-seeking behavior and self-monitoring of mental health symptoms (11).

Mobile applications have been particularly beneficial in facilitating early intervention, crisis support, and real-time mental health tracking (12). Users reported higher engagement and adherence to self-care strategies when apps included interactive features, gamification, and AI-based recommendations. Furthermore, apps offering direct links to mental health professionals or helplines showed a greater impact on reducing psychological distress and improving treatment compliance (11).

4.2 Need for Further Research and Development

Despite the potential benefits of mental health applications, several challenges remain.

There is a lack of randomized controlled trials (RCTs) evaluating the efficacy of mobile health interventions in India (14). Most existing research focuses on short-term usability and acceptability rather than long-term clinical effectiveness (14). Additionally, the majority of mobile apps target depression and anxiety, while interventions for conditions such as schizophrenia, substance use disorders, and bipolar disorder remain underdeveloped (13).

There is also a need for greater cultural customization, as most mental health apps currently available in India lack regional language support and localized therapeutic content (15).

4.3 Technical and Ethical Considerations

The development and implementation of mental health applications raise several technical and ethical concerns. Studies emphasize the importance of integrating mobile health apps with electronic health record systems to improve continuity of care (12). However, challenges related to data security, privacy policies, and informed consent remain significant barriers (15). Many users lack awareness of how their personal health data is stored and used by mobile applications, which raises concerns about potential misuse or breaches of confidentiality (15). Additionally, training mental health professionals in the use of mobile health applications is essential for maximizing their effectiveness, yet very few mental health training programs incorporate digital interventions into psychiatric care models (15).

4.4 Summary of Key Findings

The review highlights that mental health apps are cost-effective and accessible solutions for addressing India's mental health crisis (13). However, most existing interventions focus on only a few psychiatric conditions, leaving gaps in the availability of mobile-based solutions for severe mental illnesses (14). The lack of regulatory oversight, limited empirical validation, and ethical concerns regarding data privacy must be addressed for mobile applications to be effectively integrated into mainstream mental healthcare (15). Future research should prioritize RCT-based studies, AI-driven mental health tools, and culturally adaptive digital interventions to enhance the long-term impact of mental health applications in India (15).

5. Psychiatric Conditions Where Mobile Apps Are Used in India

5.1 Depression

Currently available depression apps in India lack several essential features, such as local language support, audio and video content, and user location-matched resources, making them less relevant for a diverse Indian population (16A). To improve the effectiveness of these apps, customization is necessary, including regional language integration, flexible formats (audio, video, and text), user-centered diagnostic tools, and localized treatment resource connections.

An analysis of free depression-related apps available on Indian Android devices showed that only about one-third of these apps encouraged professional help-seeking or provided an explicit mention of their theoretical or empirical basis. Among the commonly used strategies in depression apps, mood monitoring, behavioral activation, cognitive restructuring, mindfulness exercises, gratitude cultivation, and medication management were frequently included (16B). However, major challenges persist, including poor user engagement, lack of scientific validation, and absence of evidence-based interventions, indicating a need for further improvement and research.

5.2 Suicide Prevention

An initial search for suicide prevention apps identified 492 apps, of which 43 met inclusion criteria for further analysis. Fewer than half of these apps (32.55%) provided scientific, evidence-based content, and only 11.62% were empirically validated (17A). Approximately one-third of the apps targeting individuals at suicidal risk included a screening component (16.12%), while another one-third (25.92%) had risk assessment tools for caregivers. The majority (81.39%) included regional suicide helpline numbers, but only a few (23.25%) incorporated motivational elements encouraging users to reach out for help (17A).

Therapeutic strategies embedded within these apps included distraction techniques, means restriction, environmental safety measures, cognitive reappraisal, and calming interventions.

Safety plans were a feature in 39.53% of the apps. However, despite the growing number of digital suicide prevention interventions, few have been rigorously evaluated for their effectiveness in reducing suicidal thoughts, self-harm, or suicide attempts (17B).

5.3 Substance Abuse

Ecological Momentary Interventions (EMI)—real-time therapeutic strategies delivered via mobile apps between therapy sessions—have been recognized as potentially effective tools for substance use treatment in India. However, more scientific validation is required before widespread adoption (18). One notable development is the QUEST App, an Android-based relapse prevention tool for alcohol dependence. Initial trials showed a 65% acceptability rate and a usability score of 5.8 out of 7, making it one of the first attempts to create a smartphone-based intervention for alcohol dependence in India. However, further validation on a larger sample size, across multiple languages, and incorporating user feedback is necessary (19).

5.4 Autism and Children's Mental Health

Mobile apps have shown promise in early intervention programs for children with autism, particularly in enhancing learning opportunities. A study on learning progress profiles demonstrated that 90% of children preferred drag-and-drop or touch-based interactions over conventional classroom methods. Additionally, 84% of children showed improvements in pre-writing skills (scribbling, tracing, dot-joining, copying), and 25% exhibited improved social. engagement, such as greeting teachers and peers (20A).

Despite these benefits, most autism-related mobile health (mHealth) apps lack usability, feasibility, and efficacy validation before being introduced to vulnerable populations (20B).

While TOBY (Therapy Outcome by You) is one of the more structured interventions, most other apps target only specific difficulties rather than offering a holistic approach. Apps providing parental support were found to be as effective as in-person interventions, with lower costs and better outcomes for children (20B).

In the context of autism screening, mobile applications offer significant potential to democratize early diagnosis, enhance objectivity, and empower families with real-time information. However, these advantages are accompanied by ethical concerns, privacy risks, and the need for rigorous validation and standardization. To maximize their impact, further research, stakeholder collaboration, and ethical safeguards are essential (20C).

5.5 Adolescents and Mental Health Apps

A review of mobile apps designed for pediatric and adolescent mental health identified 24 relevant publications, covering 15 different apps. Only two apps were available for download, and among the three apps evaluated through randomized trials and case studies, none demonstrated a significant impact on mental health outcomes (21A).

Among the available apps, POD Adventures, a digital mental health intervention for adolescents, was found to be feasible, acceptable, and associated with significant improvements in problem severity and mental health symptom reduction when delivered with guidance from lay counselors in Indian schools (21B). However, despite the growing availability of adolescent mental health apps, most lack rigorous research evaluation, limiting their credibility and effectiveness.

5.6 Dementia

Dementia screening apps have the potential to reduce costs, shorten diagnostic time, and minimize dependence on highly trained professionals in resource-limited settings (22). While several mobile cognitive screening (MCS) tools exist, there is an overall lack of validated, India-specific dementia apps, necessitating further research into their applicability in clinical practice.

5.7 Mood Disorders

Although a wide range of mobile applications for mood disorders exists, only a handful have strong scientific evidence supporting their efficacy. Most apps remain underdeveloped in terms of clinical validation, long-term engagement strategies, and integration into healthcare systems. The need for systematic validation and testing through clinical trials is critical (23).

5.8 Panic Disorder

Panic disorder apps have potential but currently lack comprehensive, evidence-based content. Many available apps need further improvements in assessment tools, interactive interventions, and real-time monitoring options to enhance their effectiveness (24).

5.9 Serious Mental Illness (SMI) and Schizophrenia

Among individuals with serious mental illness (SMI), including schizophrenia and bipolar disorder, 86% reported owning a mobile phone, with 60% using smartphones. Despite this high digital access, mobile mental health interventions remain underutilized among individuals with psychosis and neurocognitive impairments. App developers should consider tailoring interventions to accommodate cognitive deficits and functional limitations in these populations (25A).

5.10 Natural Disasters and Mental Health Apps

The role of mobile health (mHealth) apps in mental health responses to natural disasters is still emerging. A review of five studies showed that mobile apps have significant potential to support mental health before, during, and after disasters. However, further research is required to assess their long-term effectiveness and integration into disaster response strategies (25B).

5.11 Chronic Pain and Mental Health Apps

Chronic pain affects over 2 billion people globally, impacting employment, sleep, mental well-being, and social relationships. Many individuals with chronic pain seek digital tools that can address their physical and psychological distress. Apps like Wysa, which offer AI-based mental health support, have shown promise in bridging the gap between demand for psychological care and the limited availability of mental health professionals (25C).

Summary and Key Insights

Mental health apps in India address a wide range of psychiatric conditions, but challenges persist in usability, effectiveness, and scientific validation.

Depression apps need localization and culturally adaptive interventions.

Suicide prevention apps lack motivational and crisis intervention components.

Substance abuse apps like QUEST show promise but require wider validation.

Autism intervention apps can enhance early screening and parent support but need more holistic approaches.

Pediatric and adolescent mental health apps lack strong evidence, except for POD Adventures.

Apps for schizophrenia and serious mental illness need to accommodate cognitive challenges.

Disaster response apps show potential but need further research.

Chronic pain management apps have emerging mental health benefits.

Further rigorous clinical trials, improved app customization, and integration with India's healthcare infrastructure are needed to maximize the potential of mobile mental health interventions.

6. Concerns and Limitations of Mobile Mental Health Applications

6.1 Limitations of Existing Research and Meta-Analyses

Several limitations must be considered when evaluating the current evidence on mobile mental health applications. First, the possible negative effects of smartphone interventions, such as symptom deterioration or increased dependence on digital interventions, were not assessed in most studies. Future research should systematically examine these potential adverse effects to ensure that smartphone-based mental health solutions are not inadvertently causing harm (26a).

Second, the long-term effectiveness of smartphone interventions remains unclear. Most studies varied significantly in their follow-up periods, and dropout rates were inconsistently reported. This raises concerns about whether improvements in mental health observed in short-term trials are sustained beyond the study period. Assessing the long-term efficacy of mental health apps is crucial, as evidence from internet-based interventions suggests that some digital interventions can have lasting benefits (26b). Third, nearly all included studies relied on self-reported measures rather than clinician-rated assessments. Previous meta-analyses have shown that clinician-administered evaluations tend to yield larger effect sizes in psychotherapy trials than self-reported data. This suggests that the current effect size estimates for mobile mental health apps may be understated, and future studies should incorporate objective, clinician-rated measures to assess the true impact of these interventions (26c).

6.2 Privacy and Data Security Concerns

A significant barrier to informed decision-making for users is the complexity of privacy policies associated with mental health apps. Many apps collect sensitive personal data, yet their data usage policies remain vague or difficult to understand. Without transparent privacy frameworks, users may unknowingly compromise their confidentiality, leading to potential ethical and legal concerns (26b). Strengthening privacy regulations and enforcing clear, user-friendly privacy policies should be a key focus in the development of mobile health interventions.

6.3 Variability in App Effectiveness and Study Quality

Studies focusing specifically on anxiety and depression symptoms were generally of moderate to high quality and reported small to medium effect sizes. Similarly, the effects of apps on stress and quality of life were found to be moderate in impact but varied across studies (26d).

There is also a discrepancy between the effectiveness of standalone apps versus those that include professional guidance. Standalone apps tend to produce smaller effect sizes but demonstrate higher empirical quality, while apps with professional support yield better clinical outcomes due to increased engagement and structured interventions. Additionally, studies that included follow-up assessments (11 weeks or longer) mostly found that the mental health benefits of mobile apps were sustained over time, reinforcing their potential as long-term self-management tools (26d).

6.4 The Need for Comprehensive Research and Clinical Integration

While mobile apps for anxiety and depression show clinical promise, they should be further validated through rigorous randomized controlled trials (RCTs) with long-term follow-ups.

Moreover, integrating mobile interventions into traditional psychiatric care—either as standalone self-management tools or adjunctive treatments—could enhance their real-world effectiveness (26d).

6.5 Summary and Future Directions

Despite the advantages of mobile mental health apps, several concerns need to be addressed:
Limited research on potential negative effects such as increased dependence or symptom deterioration.

Uncertainty regarding long-term effectiveness, as follow-up data is inconsistent.

Reliance on self-reported measures, which may under-estimate the true clinical impact.

Privacy and data security issues, requiring clearer policies and stronger regulatory oversight.

Variability in app effectiveness, with professional-guided apps showing better outcomes than standalone interventions.

Future studies should focus on addressing these limitations by:

1. Conducting long-term RCTs to assess the sustained impact of mental health apps.
2. outcomes.
3. Incorporating clinician-administered evaluations alongside self-reported
4. Developing standardized privacy frameworks to ensure ethical data use.

Improving accessibility and usability, particularly for diverse populations in India.

By overcoming these challenges, mobile mental health interventions can transition from experimental digital tools to fully integrated components of psychiatric care, improving mental health outcomes for a wider population in India and beyond.

7. Software Usage: Indian Scenario

Mobile health applications (MHAs) serve as bridging platforms between mental health professionals and users, offering digital interventions that enhance access to mental healthcare. However, current app usage in India is not fully integrated into psychiatric treatment, and most mental health apps function as self-help tools rather than structured clinical interventions. This highlights the significant demand and market potential for MHAs that can effectively evaluate, monitor, and treat individuals with mental illnesses in India and other Asian countries. To develop cost-effective and clinically validated MHAs, mental health professionals, software developers, and policymakers must collaborate to ensure these apps are scientifically robust, user-friendly, and culturally adaptable (9a).

Globally, the United States and other Western nations lead the MHA market, contributing to 50% of all available mental health apps, while the Asia-Pacific region, including India, accounts for only 4% (Li et al., 2014; Palmier-Claus et al., 2013). Western countries have successfully implemented MHA-based interventions for mental health assessment and treatment, but similar digital mental health advancements in India remain underdeveloped.

Currently, India has few apps specifically designed for depression, anxiety, and substance. use disorders, and most

existing mental health apps serve only as communication platforms rather than full-fledged intervention tools (Shang et al., 2020). Additionally, MHAs targeting severe mental illnesses such as schizophrenia (Patil et al., 2020) are extremely limited.

The Indian mobile health sector presents a significant opportunity for public health advancements. Studies suggest that mobile-based mental health screening and intervention strategies can significantly increase help-seeking behavior and service utilization. For instance, a study by Maulik et al. (2017) demonstrated that using mobile-based screening tools increased mental health service utilization from 0.8% to 12.6% post-intervention. These findings highlight the potential of mobile health interventions to reduce the mental healthcare treatment gap in India.

However, despite the growing demand for MHAs, barriers to widespread adoption persist. These include low mental health literacy, privacy concerns, lack of awareness, and the absence of regulatory frameworks to monitor app efficacy and data security. Future developments should focus on creating culturally relevant, evidence-based digital mental health solutions tailored to the linguistic and socio-economic diversity of India.

8. DISCUSSION

The rapid growth of MHAs offers unprecedented opportunities to assess health behaviors, track mental health outcomes, and engage underserved populations (Berrouiguet et al.,2016; Li et al., 2014; Rathbone & Prescott, 2017). In India and other Asian countries, where mental health stigma remains a major barrier, MHAs could serve as culturally appropriate interventions to encourage mental health awareness, early detection, and treatment compliance (Li, 2012; Li & Seidman, 2010).

While the findings of this review highlight the potential benefits of MHAs, several key gaps and challenges must be addressed:

8.1. Limited Research on MHA Efficacy in India

Most existing research on MHAs originates from Western countries, and only a few studies have evaluated their efficacy, feasibility, and acceptability in Indian populations. This lack of region-specific data hinders the ability to develop culturally relevant interventions tailored to India's diverse socio-economic and linguistic backgrounds (9a).

8.2. Regulatory and Privacy Concerns

There are no standardized regulatory guidelines for mental health apps in India, raising concerns about data security, misinformation, and ethical considerations. Many MHAs lack transparency in data collection and privacy policies, making them vulnerable to potential misuse of personal health information (26b). Implementing stronger data protection laws and certification frameworks is crucial to ensure user safety and app credibility.

8.3. Digital Divide and Accessibility Issues

Despite the increasing penetration of smartphones and mobile internet, many rural and marginalized communities in India still lack access to reliable digital health resources.

Additionally, language barriers and literacy limitations reduce the effectiveness of English-based MHAs. Future interventions should focus on multilingual, voice-assisted, and visually interactive mental health applications to enhance accessibility.

8.4. Need for Randomized Controlled Trials (RCTs) and Long-Term Studies

Most existing studies on MHAs have focused on short-term outcomes, with limited data on long-term effectiveness, relapse prevention, and sustained mental health improvements. RCT-based research with extended follow-ups is necessary to determine whether digital mental health interventions provide lasting benefits (26c).

8.5. Integration with India's Healthcare System

MHAs in India currently operate as standalone tools rather than integrated components of the healthcare system. For digital mental health interventions to be widely adopted, they must be incorporated into India's primary healthcare services, telepsychiatry programs, and community-based mental health initiatives. Government-led collaborations with psychiatrists, psychologists, software developers, and policy experts could facilitate this integration.

9. CONCLUSION

Mobile health applications (MHAs) have the potential to revolutionize mental healthcare in India by offering cost-effective, accessible, and scalable solutions for managing psychiatric disorders. However, despite their growing popularity, MHAs remain underutilized in clinical settings and lack integration into India's formal healthcare system. The absence of comprehensive regulatory guidelines, limited empirical validation, and concerns regarding data privacy and misinformation pose significant challenges to their widespread adoption.

Future efforts should prioritize culturally adaptive, evidence-based mobile mental health interventions and strengthen privacy regulations to ensure ethical digital healthcare practices. Additionally, collaborations between mental health professionals, software developers, and policymakers are essential to ensure that MHAs are scientifically validated and effectively implemented in real-world psychiatric care.

By addressing these challenges and research gaps, MHAs could play a transformative role in reducing India's mental health treatment gap and enhancing digital mental health accessibility across diverse populations.

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