ORIGINAL RESEARCH ARTICLE

Assessing the features of mobile Apps for self-management of postpartum depression

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Abstract

Postpartum depression (PPD) is a significant global health concern, impacting the well-being of mothers and their infants during the postpartum period. Digital health solutions, particularly mobile applications, have emerged as promising tools for PPD management. This study systematically evaluates the landscape of PPD apps, identifying 115 relevant applications available on iOS and Android platforms. Through a comprehensive analysis, we assess their availability, popularity, key features, and technological advancements. Many of these apps integrate artificial intelligence (AI), machine learning, and wearable devices to enhance risk assessment, personalized support, and real-time monitoring. While these apps offer improved access to mental health resources, early screening, and self-management tools, considerable variability exists in their quality, functionality, and adherence to privacy and security standards. The lack of standardized evaluation frameworks raises concerns about their reliability and clinical effectiveness. Ensuring evidence-based practices, rigorous validation, and quality assurance is critical to optimizing their impact. Our findings emphasize the need for further research, standardized app evaluation frameworks, and implementation studies to facilitate clinical integration. Additionally, expanding multilingual support and telehealth features can improve accessibility for diverse populations. Strengthening mHealth solutions through these advancements can enhance maternal mental health care, benefiting both patients and healthcare providers. *(Afr J Reprod Health 2025; 29 [3]: 132-142).*

Keywords: Depression management; evidence-based practices; maternal mental health; mobile health (mhealth); postpartum depression apps

Résumé

La dépression post-partum (PPD) est un problème de santé mondial important, ayant un impact sur le bien-être des mères et de leurs nourrissons pendant la période post-partum. Les solutions de santé numérique, en particulier les applications mobiles, sont devenues des outils prometteurs pour la gestion de la DPP. Cette étude évalue systématiquement le paysage des applications PPD, identifiant 115 applications pertinentes disponibles sur les plateformes iOS et Android. Grâce à une analyse complète, nous évaluons leur disponibilité, leur popularité, leurs fonctionnalités clés et leurs avancées technologiques. Beaucoup de ces applications intègrent l'intelligence artificielle (IA), l'apprentissage automatique et les appareils portables pour améliorer l'évaluation des risques, l'assistance personnalisée et la surveillance en temps réel. Bien que ces applications offrent un accès amélioré aux ressources en santé mentale, au dépistage précoce et aux outils d'autogestion, il existe une variabilité considérable dans leur qualité, leurs fonctionnalités et leur respect des normes de confidentialité et de sécurité. L'absence de cadres d'évaluation standardisés soulève des inquiétudes quant à leur fiabilité et leur efficacité clinique. Garantir des pratiques fondées sur des preuves, une validation rigoureuse et une assurance qualité est essentiel pour optimiser leur impact. Nos résultats soulignent la nécessité de recherches plus approfondies, de cadres d'évaluation d'applications standardisés et d'études de mise en œuvre pour faciliter l'intégration clinique. De plus, l'extension du support multilingue et des fonctionnalités de télésanté peut améliorer l'accessibilité pour diverses populations. Le renforcement des solutions mHealth grâce à ces avancées peut améliorer les soins de santé mentale maternelle, bénéficiant à la fois aux patients et aux prestataires de soins de santé. *(Afr J Reprod Health 2025; 29 [3]: 132-142).*

Mots-clés: Gestion de la depression; pratiques fondées sur des données probantes; santé mentale maternelle; santé mobile (mHealth); applications pour la dépression post-partum

Introduction

The postpartum period, characterized by the joys and challenges of new motherhood, is a critical phase in a woman's life. While it is often celebrated as a time of bonding with the newborn, it can also be marked by emotional struggles and the onset of postpartum depression (PPD).[1] Postpartum depression (PPD) is a clinically significant depressive episode commencing within four weeks following childbirth, potentially extending beyond the postpartum period.[2]

It is a complex mental health condition that affects a significant number (13%) of women worldwide, with varying degrees of severity.[3] Having a personal or family history of mental disorders increases the risk of postpartum mood disorders due to its heritability component.[4,3,5] As the World Health Organization (WHO) acknowledges, postpartum depression is a global concern. It transcends geographical boundaries, affecting women across diverse cultures and regions.[6]

Telepsychiatry, a technological advancement, has played a crucial role in advancing mental health interventions. It started with telephone consultations to offer remote support. As internet services improved, teletherapy emerged, and later, mobile health (mHealth) applications were developed. Currently, PPD apps enhance this legacy with AI chatbots, digital cognitive behavioral therapy (CBT), and teleconsultations, positioning today's mobile apps as an evolution in mental health services.[7]

The latest PPD apps have seen significant advancements aimed at improving the early detection and management of this mental health condition**.** Recent studies have highlighted the incorporation of machine learning algorithms and natural language processing techniques into PPD apps, enhancing their ability to analyze user-generated content, such as text-based input and voice recordings, to assess PPD risk.[8,9] Additionally, these apps have integrated wearable devices and physiological sensors to monitor maternal vital signs and emotional states in real-time, providing a more comprehensive understanding of the user's mental and physical well-being.[10] Moreover, there has been a focus on personalized treatment plans and Teletherapy options within these apps, offering tailored interventions to address individual needs and preferences.[6]

Recent studies also emphasize the critical importance of quality assurance in ensuring these apps' accuracy and adherence to evidence-based practices, particularly in mental health information dissemination.[11, 12, 13] Additionally, the clinical validity of mood tracking and assessment tools has been highlighted, with studies pointing to their role in early PPD symptom detection.[14] Notably, the use of artificial intelligence-powered apps for personalized interactions has the potential to improve the management of depression.[13] Many studies recognize the unique sociocultural factors that influence maternal mental health in the Middle East, emphasizing the importance of tailored interventions within PPD apps.[15,16] Recent studies conducted in Saudi Arabia have contributed to the development of culturally sensitive PPD apps, acknowledging the unique sociocultural factors that influence mental health in the region.[16] Furthermore, global research efforts have emphasized the importance of international collaboration in refining these apps, ensuring their effectiveness and accessibility across diverse populations.[17]

This article delves into the latest features of Postpartum Depression Applications (apps), highlighting how modern technology plays a pivotal role in early detection, management, and support for women experiencing PPD. By examining these technological advancements, we aim to comprehensively understand how Postpartum Depression Apps are becoming invaluable resources in promoting maternal mental health and well-being. This article also explored how these apps leverage these features, ensuring that mothers receive timely assistance and that their emotional well-being is prioritized.

Methods

Methods for searching and selecting postpartum depression (PPD) apps platform

We conducted a systematic search for Postpartum Depression (PPD) apps on both iOS and Android platforms.

Study period

We conducted an extensive search between April 29th, 2023 and May 22nd, 2023.

Apps search strategy

On the iOS and Android platforms, we utilized the App Store’s search function to find the apps. We followed the flow diagram in Figure 1 to develop the search strategy and meet the study's objectives.

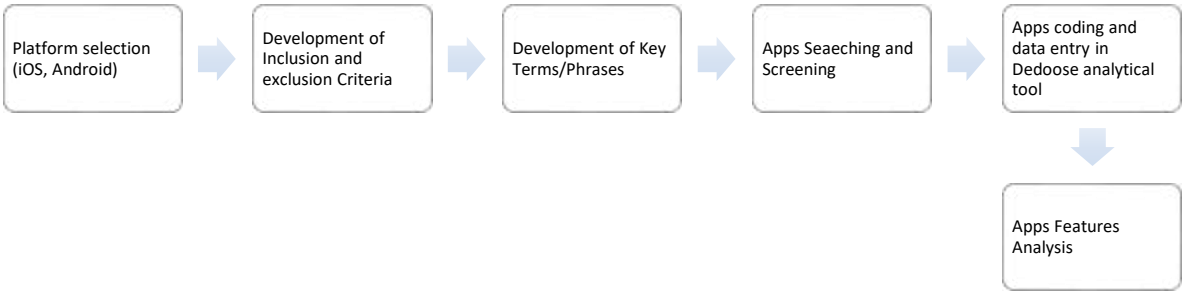

Figure 1: Apps Search Strategy Flow Diagram

Inclusion criteria

Relevance: The apps directly related to Postpartum Depression, offering content, tools, or resources for users dealing with PPD were included.
Language: Apps in English and Arabic languages relevant to the study region were considered.
Availability: Freely available apps on Android and iOS operating systems and accessible to the general public were included.

Exclusion criteria

Irrelevant Apps: Apps not related to PPD or primarily focused on other topics were excluded.
Incomplete Apps: Non-functional apps were excluded.
Limited Access: Apps that required a subscription or payment to access essential PPD-related features were excluded.

Development of key terms/phrases

To identify relevant PPD apps, we employed a structured search strategy by developing key terms specific to PPD and designing a syntax/phrase based on keywords. The development of syntax/phrases involved a combination of terms commonly associated with Postpartum Depression. The following key phrases were used for the search:"Postpartum Depression", "Postnatal Depression", "Postpartum Mood Disorder", "Maternal Mental Health", "New Mom Depression", "Baby Blues", "Motherhood and Mental Health", "PPD Support", "PPD Self-Help", "Postpartum Counseling", "PPD Tracker", "Mother's Emotional Well-being", "Postpartum Mental Health App", "Postpartum Wellness", "New Mom Resources"

Apps selection

We entered the above-mentioned keywords/phrases individually to identify PPD-related apps. The search results from both iOS and Android platforms were screened independently by two reviewers, Asim Mehmood (AS) and Manal Almalki (MA), based on the inclusion and exclusion criteria. During this phase, we scrutinized the titles, descriptions, and keywords of the identified apps. We considered those apps that were publicly accessible on app stores. However, any apps removed by its developer from the app store during our defined search period were excluded from the study. This exclusion was based on the understanding that removal indicated these apps were no longer accessible to consumers.

Apps meeting the inclusion criteria were added to a list of potential candidates and coded using the Dedoose software. The reviewers cross-verified the identified apps to ensure consistency and reliability. Any discrepancies in application selection were resolved through discussion and consensus among the reviewers. The selected apps were then further evaluated for their relevance and functionality.The above systematic methodology ensured a structured and comprehensive approach to identifying and selecting PPD apps on both iOS and Android platforms.

Results

After extensive research on the iOS Store and Android platform, 132 distinct apps were identified as freely available on both platforms (see Appendix 1 for a comprehensive list of apps). iOS hosted 77% of apps, with higher average ratings (4.3*) compared to Android (3.9*) (Table 1).

Table 1: Platform distribution and regional accessibility

Platform	Number of Apps	Avg. User Rating (★)	Region-Specific Apps (Examples)
iOS	101	4.3	Labayh (Middle East), Tanfees (Kuwait)
Android	31	3.9	Edinburgh Postnatal Test, PPDACT

Table 2: Language support distribution

Language	Number of Apps	Example Apps	Culturally Tailored
English	98	BetterHelp, Wysa, Sanvello	No
Arabic	17	Labayh, Tanfees, كلنا معك	Yes
Spanish	4	Youper, Clarity - CBT Diary	No
German	6	MoodLinks, Depression Test	No
Chinese	7	Depression Test Pro	No

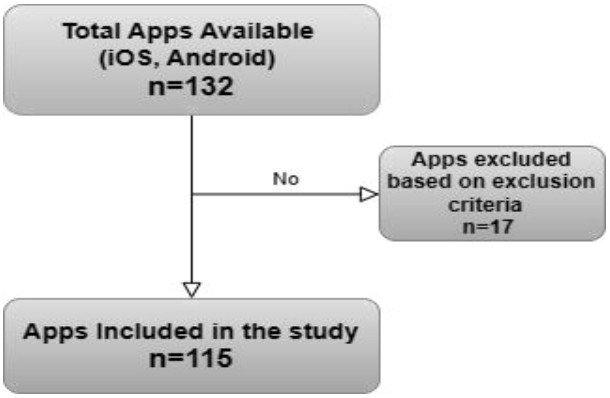

Figure 2: Apps selection process

Region-specific apps like Labayh (Arabic) were iOS-exclusive, limiting accessibility in Android-dominated markets.

Among 132 apps, the highest number (74%) supported the English language, while Arabic language support was the second most common (13%), as shown in Table 2. Culturally tailored Arabic apps like Labayh and Tanfees focused on regional mental health needs but lacked advanced features like AI or CBT. Subsequently, 17 apps were excluded based on Language, descriptions, irrelevancy, and inaccessibility during the review process. The remaining potential apps (n=115) were included in the study for further analysis, as shown in Figure 2.

Information retrieval from Apps

We explored and recorded the features and available information related to the chosen apps in the Dedoose application for further analysis, where the apps were already coded. We specifically focused on the following available information within the apps.Stars Rating, Version. Key Features, Developer Information, Language, Application Name, Link, Application logo, Platform (iOS or Android), Description, User Ratings and Reviews. The collected data from the selected apps allowed us to assess the availability, popularity, and key features. This analysis aimed to provide valuable insights into the current landscape of PPD-related mobile apps.

Following careful consideration and review of descriptions from 115 apps, extracted excerpts were organized into 6 distinct groups based on features as given in Table 3.

Our comprehensive review process thoroughly evaluates the features offered by apps across different groups mentioned above. We also closely examine their approach to data safety, security practices, and privacy policy statements to ensure that users' personal information is protected. We also highlighted the presence of critical features (AI, CBT, multilingual support, wearable integration) and compliance with clinical/ethical standards (Table 4). Only 13% of apps offered Arabic support, and 18% cited clinical validation. AI and CBT were common in high-rated apps (e.g., Woebot, Sanvello), but maternal-specific apps like Motherocity lacked CBT.

Apps analysis

General mental health and wellness

General Mental Health and Wellness mobile apps are designed to promote overall emotional and psychological well-being.

Table 3: Apps' classification based on core features

General Mental Health and Wellness	Mood Tracking and Emotional Support	Depression Screening and Assessment	Therapy and Cognitive Behavioral Therapy (CBT)	Maternal Mental Health	Online Therapy and Support
Dr.Mind: Mental Health Tests	Sanvello: Anxiety & Depression	Depression Test Pro	Haplocare	Motherocity Postpartum Tracker	BetterHelp – Therapy
Sagapo: CBT, Self-Care Therapy	InMood: Track Feeling - Notes	Thought Diary depression - CBT	APGO Perinatal Depression	Lifeline4Moms	ifeel | Online Therapy
MindDoc: Your Companion	Moodfit: Mental Health Fitness	Depression Test+	Thought Diary depression - CBT	Mom Genes Fight PPD	Talkspace Therapy & Counseling
BetterMe: Mental Health	MoodLinks: Anxiety·Depression	Depression Test	Sagapo: CBT, Self-Care Therapy	MamaMend Postpartum Tracker	ReGain - Couples Therapy
Woebot: Your Self-Care Expert	uMore - Mental Health Tracker	Depression Test & Help To Fight	CBT Therapy: Mental Healthcare	Postpartum Depression Test	Hiwell Therapy & Mental Health
BetterHelp – Therapy	Wysa: Mental Health Support	Depression Test Mental Health	Youper - CBT Therapy	Edinburgh Postnatal Depression	TalkLife
Flow - Depression treatment	Feelmo: Mental Health Support	Simple Depression Test	Clarity - CBT Thought Diary		
Cerebral - Mental Health	Daily Journal: CBT Self Care	Depression Test & Help To Fight	Bloom: CBT Therapy & Journal		
Altibbi	Mood Tracker Journal	Depression Diary	CBT Thought Diary: Depression		
Hiwell Therapy & Mental Health	Reflectly - Journal & AI Diary	Beck Depression Inventory Test	ACT Companion: Happiness Trap		
Labayh	Mooditude: Mental Health App	Depression Screening Test	MindShift CBT - Anxiety Relief		
Serene: Practice Self-Care	MyPossibleSelf: Mental Health	Beck Depression Test			
Cups: Online Therapy & Chat	CBT Companion: Therapy App	Depression Calculator			
Flow - Depression treatment	CBT Thought Diary: Depression	PPD Screening			
FreeCBT	Pocket Depression Test				

PsyHelp - Self therapy	Positive Pregnancy with AJ
BetterMe: Mental Health	TalkLife
Mental Health Scales	Shmoody: Improve Your Mood
Happy - A Mental Health App	RiseUp: AI based CBT Therapy
Thinkable Mental Wellness	Mental Health Tests
Lifeline4Moms	
Altibbi	

Table 4: Key features and accessibility of top PPD Apps

App Name	AI Support	CBT Techniques	Multilingual	Wearable Integration	Clinical Validation	Privacy Policy	User Rating (★)
APGO Perinatal Depression	No	No	No	No	Yes	Yes	5.0
Wysa	Yes	Yes	No	No	Yes	Yes	4.9
Sanvello	Yes	Yes	No	No	Yes	Yes	4.8
Woebot	Yes	Yes	No	No	Yes	Yes	4.7
Labayh	No	No	Yes (Arabic)	No	No	Yes	4.6
PPDACT	Yes	No	No	No	Yes	Yes	4.5
Tanfees (تنفيس)	No	No	Yes (Arabic)	No	No	Yes	4.5
Motherocity Postpartum	No	No	No	Yes	Yes	Yes	4.3

These apps offer a wide range of features and resources to help users manage stress, anxiety, and other common mental health challenges. With features such as meditation exercises, coping strategies, and self-help tools, these apps provide valuable support for individuals looking to enhance their mental health and maintain a positive outlook on life.

Many apps also include educational content about depression, anxiety, and postpartum mental health. However, the accuracy of the information and its alignment with evidence-based practices should be verified to ensure users receive reliable guidance.

Following are some apps that have the highest user rating and satisfaction.

Cerebral - mental health: Offers fully online mental health care for a range of issues, including anxiety and depression.

It provides professional support but may not be as user-driven as other apps.

Flow depression treatment: A guide based on psychology and neuroscience research for understanding, treating, and preventing depression. It's informative but lacks interactive features found in other apps.

Labayh: A platform for consultations in Arabic, connecting users with counselors and experts. It caters to an Arabic-speaking audience for psychological and family consultations.

7 Cups: Online Therapy & Chat: Provides peer support and conversations for various mental health

challenges. It's valuable for individuals seeking connection with others experiencing similar issues.

Mood tracking and emotional support

Many apps offer mood tracking and self-assessment tools, allowing users to monitor their emotional well-being over time. These features are essential for recognizing patterns and identifying potential PPD symptoms early on. However, the accuracy and clinical validity of these assessments should be scrutinized to ensure they align with recognized diagnostic criteria.

Following are some apps that have highest user rating and satisfaction.

Sanvello: Sanvello offers mood tracking and cognitive behavioral therapy tools. It stands out for its user-friendly interface and customization based on mood patterns, providing tailored support rooted in CBT.

Wysa: Wysa is research-backed and employs techniques from CBT and DBT. It provides a wide range of mental health support, making it a comprehensive option. However, some users may find the AI chatbot interaction less personal than human support.

Reflectly - Journal & AI Diary: This app combines mood tracking with journaling and AI support. It helps users vent their thoughts and feelings, promoting mindfulness. It's a useful addition for those who benefit from journaling.

Depression screening and assessment

The apps that track and assess depression were specially designed to follow up on depression and continuous improvement through analyzing thoughts, especially negative and suicidal thoughts, and monitoring moods and symptoms. They aim to improve these aspects by providing directions, advice, exercises, or guidance to seek specialists in severe cases. These apps are specifically designed to treat depression by improving mood and reducing the severity of depression through cognitive therapy. Most apps utilize chatbots to assist users in finding information and enhance the communication experience.

Following are some apps that have the highest user rating and satisfaction.

Depression test pro: A simple tool based on the Burns Depression Checklist for assessing depression severity. It's easy to use but lacks extensive support beyond screening.

Beck depression inventory test: This widely recognized psychometric test provides a detailed assessment of depression severity. It's valuable for professionals but may be less user-friendly for individuals.

PPD Screening: Focusing on postpartum depression, this app uses the Edinburgh Postnatal Depression Scale. It serves its purpose for screening during the perinatal period.

Therapy and Cognitive Behavioral Therapy (CBT):

Several apps incorporate CBT techniques, a well-established therapeutic approach for managing depression and anxiety. This inclusion is commendable, but the effectiveness and depth of CBT content may vary between apps.

Following are some apps that have highest user rating and satisfaction.

Youper - CBT Therapy: Utilizes CBT techniques to calm anxiety and improve mood. Its user-friendly interface and focus on CBT make it a practical choice for self-help.

Bloom: CBT Therapy & Journal: Offers affordable therapy and guidance through CBT. It's accessible and aims to make therapy more approachable.

MindShift CBT - Anxiety Relief: This app targets anxiety relief through CBT strategies. It's helpful for those specifically dealing with anxiety issues but may not cover a broad range of mental health concerns.

Maternal mental health

These apps are designed to provide invaluable assistance to expectant mothers and new moms during their transformative journey to motherhood. Pregnancy and the postpartum period are profound life experiences, and these apps are your trusted companion, offering a wide range of features and resources to ensure your emotional well-being.

Following are some apps that have highest user rating and satisfaction.

Motherocity postpartum tracker: Provides comprehensive support for postpartum mothers, including tracking, planning, and a health directory. It's a valuable resource for maternal mental health.
Myri: Offers personalized guidance for postpartum wellness. It's focused on addressing the unique needs of new mothers.
PPDACT: A research app aimed at understanding the genetic basis of postpartum depression. This app is designed to facilitate research and is accessible to a wide range of users. It supports data collection and analysis.

Online therapy and support

Some apps offer community support, enabling users to connect with others who may be experiencing similar challenges. While peer support can be valuable, the quality and safety of these communities should be evaluated to ensure they provide a supportive and non-judgmental environment.
Following are some apps that have highest user rating and satisfaction.
BetterHelp - Therapy: Connects users with licensed therapists for various mental health concerns. It offers the convenience of online therapy, but the effectiveness may vary depending on the therapist's qualifications.
Talkspace Therapy & Counseling: Similar to BetterHelp, it provides access to licensed therapists. Users can choose individual or couples therapy. Effectiveness may depend on the therapist matched with the user.
Overall, the suitability of such apps depends on individual needs and preferences. It's important to choose an app that aligns with your specific mental health goals and consult with a healthcare professional when necessary for a comprehensive evaluation and treatment plan

Discussion

This review explores the features of postpartum depression mobile apps in the virtual market, considering different parameters, features, and available information. We identified 115 apps on iOS and Android platforms, where the applications were available freely. Over the past five years, research on mobile depression apps has expanded, showing promising results.

We scrutinized the various categories of mobile applications designed to address postpartum depression (PPD) and related mental health issues, shedding light on their distinctive features and potential benefits. These categories encompass general mental health and wellness apps, mood tracking and emotional support tools, depression screening and assessment applications, and those incorporating cognitive behavioral therapy (CBT) techniques. Additionally, maternal mental health apps and platforms offer online therapy and support. A randomized controlled trial found that using a depression app for two weeks reduced depressive symptoms more than an informational e-book. Another study suggested that adults with depressive symptoms benefited from a self-management tool, with consistent users showing improved scores on the Patient Health.[18] Talkspace, a mobile therapy app, was perceived as effective, convenient, and cost-effective in a pilot study.[19] Recent research showed that using Betterhelp reduced depressive symptoms in individuals new to psychotherapy.[20] Chatbots in three evaluated apps offer AI-driven support, including educational resources and diagnostic assessments.[19, 21]

After downloading the apps, we explored their functionality. In this study, we included apps that were available to download free of cost. Free apps sometimes have limited features, while feature-rich apps could lack quality. A study conducted in China concluded that freely available apps for postpartum depression have low levels of adherence to clinical evidence-based practice. They stressed developing new apps and suggested reviewing existing ones for better evidence-based practices.[12] In 2016, a study on cognitive-behavioral therapy apps found disparities in functionality and quality, with most lacking privacy policies.[19]
In our study, we reviewed the apps' data safety, security practices, and privacy policy statements. We found no disparities in data encryption. Using technology can help address gaps in depression self-management. Many people with depressive symptoms do not receive treatment, and mobile health tech can improve access and screening.[22] It

can also assess self-management interventions' suitability and generate data for societal impact and intervention efficacy.[22,23] Moreover, this data can inform informatics-driven health interventions, alerting healthcare providers in severe cases. These apps can help reach demographics with limited access to care, reduce depression management costs, and ease healthcare burdens. This perspective aligns with recent research favoring depression-specific apps but advises against sole reliance on them.[24] The discussion underscores the need for users to assess the quality of CBT resources and the suitability of these apps for their individual needs.[25] Ultimately, it reinforces the importance of these apps complementing comprehensive evaluations and treatment plans conducted by healthcare professionals, aligning with recent research in this field.[26]

Some factors, such as user engagement, digital literacy, and the digital divide, have a practical impact on the use of the PPD app.[27] Low levels of digital literacy among specific demographics might hinder their ability to use these apps effectively. Integrating multilingual support and digital health literacy into postpartum depression (PPD) apps is a crucial, yet largely unexplored area. In our analysis, 74% of the apps provided English interfaces (Table 2), but only 13% offered Arabic support. This highlights a significant gap, especially considering the high prevalence of PPD in Arabic-speaking regions.[28]

Apps designed for specific cultures, like Labayh and Tanfees (**تنفيس**), have met linguistic requirements but fall short in offering advanced features like AI-driven CBT or wearable tech (Table 4). This highlights a wider trend where non-English applications frequently compromise on technology sophistication in favor of regional relevance. Such misalignment could lead to ongoing therapeutic inequities, leaving underserved communities with lesser-quality tools than those available to English speakers. Apps with dense text, such as the Edinburgh Postnatal Depression Scale, or those with complex interfaces like the PPDACT, may alienate users who have limited literacy skills. This issue is especially evident in regions where mental health stigma hinders individuals from seeking assistance.[24]

Furthermore, disparities between platforms exacerbate accessibility issues, such as 77% of apps being exclusive to iOS (Table 4), despite Android holding the majority share in low-income countries.[29] For example, the Motherocity Postpartum Tracker (available only on iOS) provides wearable integration but excludes CBT, whereas the Android-based Postpartum Depression Self-Evaluation lacks any clinical validation.

To address these shortcomings, future applications need to implement adaptive multilingual AI interfaces, such as dynamic language switching, and focus on low-bandwidth, voice-based interactions to serve users with low literacy levels better.[30] Policymakers should encourage developers to adhere to the WHO's guidelines for culturally relevant design, collaborating with local NGOs to create solutions that effectively blend technological integrity with sociocultural understanding.[31]

Recommendations

Based on our findings, we propose several key recommendations for advancing mobile health (mHealth) apps for depression management. Firstly, considerable research and development efforts should be devoted to realising the full potential of these apps. Additionally, it is essential to assist consumers in assessing the quality of commercially available depression apps. Secondly, implementation studies are necessary to explore the integration of depression apps into clinical workflows, complementing in-person clinical care based on promising randomised controlled trial outcomes.

Thirdly, expanding multilingual apps, particularly in Arabic, and integrating telehealth capabilities would enhance accessibility, especially among socioeconomically disadvantaged individuals. Digital health literacy also plays a crucial role, as users with limited technological

proficiency may struggle to navigate app functionalities.

To address this challenge, integrating voice-assisted navigation, culturally adapted content, and multilingual chatbot support will improve accessibility and usability. The article also recommends advancing frameworks for app quality evaluation, expanding multilingual and telehealth integration, and conducting implementation studies to incorporate apps into clinical care. These recommendations aim to enhance mHealth solutions for maternal mental health.

Conclusion

In conclusion, mobile apps designed to help manage depressive symptoms offer significant potential for individuals dealing with depression. However, most of these apps lack detailed guidelines for evidence-based practice and behavior change strategies. To address this, there is a pressing need for peer-reviewed studies on mHealth interventions for depression. Such research will enhance our understanding of effective features and approaches that can alleviate symptoms and improve the overall quality of life and long-term outcomes for patients.
One potential challenge in conducting a sub-analysis is that many apps examined in the study employ diverse self-management strategies. For example, a mobile app may combine video-based therapy sessions, mood tracking, and instruction on therapeutic principles. Furthermore, it's worth noting that the Arabic apps may require additional development efforts to reach the same level of quality as their English counterparts.

Authors' contributions

Manal Almalki conceptualized the idea of this study. Asim Mehmood extracted the related apps. Manal Almalki and Asim Mehmood analysed the apps' data. Asim Mehmood drafted the first version of the manuscript. Manal Almalki reviewed the final draft, and both authors agreed on the final draft.

Conflicts of interest

The authors declare that they have no known competing financial interests or personal interest that could have appeared to influence the work reported in this paper.

References

1. Collaton J, Dennis CL, Taylor VH, Grigoriadis S, Oberlander TF, Frey BN, Van Lieshout R, Guintivano J, Meltzer-Brody S, Kennedy JL and Vigod SN. The PPD-ACT app in Canada: feasibility and a latent class analysis of participants with postpartum depression recruited to a psychiatric genetics study using a mobile application. 2022; 22: 735.
2. Zhou C, Hu H, Wang C, Zhu Z, Feng G, Xue J and Yang Z. The effectiveness of mHealth interventions on postpartum depression: a systematic review and meta-analysis. 2022; 28: 83–95.
3. García-Fernández L, Romero-Ferreiro V, Padilla S, López-Roldán PD, Monzó-García M and Rodriguez-Jimenez R. The impact on mental health patients of COVID-19 outbreak in Spain. 2021; 136: 127–131.
4. Mehmood A, Rehman AU, Zaman M, Iqbal J and Hassan SSU. Self Medication: An Emerging Trend.
5. Khan S, Shapka JD and Domene JF. Counsellors' experiences of online therapy. 2022; 50: 43–65.
6. Brown SC, Perrino T, Lombard J, Wang K, Toro M, Rundek T, Gutierrez CM, Dong C, Plater-Zyberk E, Nardi MI and Kardys J. Health disparities in the relationship of neighborhood greenness to mental health outcomes in 249,405 US Medicare beneficiaries. 2018; 15: 430.
7. Pearce M, Garcia L, Abbas A, Strain T, Schuch FB, Golubic R, Kelly P, Khan S, Utukuri M, Laird Y and Mok A. Association between physical activity and risk of depression: a systematic review and meta-analysis.2022;79(6):550-9.
8. Alshikh Ahmad H, Alkhatib A and Luo J. Prevalence and risk factors of postpartum depression in the Middle East: a systematic review and meta–analysis. 2021; 21: 1–12.
9. Tsao CW, Aday AW, Almarzooq ZI, Anderson CA, Arora P, Avery CL, Baker-Smith CM, Beaton AZ, Boehme AK, Buxton AE and Commodore-Mensah Y. Heart disease and stroke statistics,2023 update: a report from the American Heart Association. 2023; 147: e93–e621.
10. Connolly SL, Hogan TP, Shimada SL and Miller CJ. Leveraging implementation science to understand factors influencing sustained use of mental health apps: a narrative review. 2021; 6: 184–196.
11. Jones E, Taylor B, MacArthur C, Bradshaw S, Hope L and Cummins. Early postnatal discharge for infants: a meta-analysis. 2020;146(3).
12. DellaCrosse M, Mahan K and Hull TD. The effect of messaging therapy for depression and anxiety on employee productivity. 2019; 4: 1–5.
13. Fitzpatrick KK, Darcy A and Vierhile M. Delivering cognitive behavior therapy to young adults with symptoms of depression and anxiety using a fully

automated conversational agent (Woebot): a randomized controlled trial. 2017; 4: e7785.
14. Li Y, Zhao Q, Cross WM, Chen J, Qin C and Sun M. Assessing the quality of mobile applications targeting postpartum depression in China. 2020; 29: 772–785.
15. Marcelle ET, Nolting L, Hinshaw SP and Aguilera A. Effectiveness of a multimodal digital psychotherapy platform for adult depression: a naturalistic feasibility study. 2019; 7: e10948.
16. Weisel KK, Fuhrmann LM, Berking M, Baumeister H, Cuijpers P and Ebert DD. Standalone smartphone apps for mental health—a systematic review and meta-analysis. 2019; 2: 118.
17. Tsai Z, Kiss A, Nadeem S, Sidhom K, Owais S, Faltyn M and Van Lieshout RJ. Evaluating the effectiveness and quality of mobile applications for perinatal depression and anxiety: A systematic review and meta-analysis. 2022; 296: 443–453.
18. Meher S, Cuthbert A, Kirkham JJ, Williamson P, Abalos E, Aflaifel N, Bhutta ZA, Bishop A, Blum J, Collins P and Devane D. Core outcome sets for prevention and treatment of postpartum haemorrhage: an international Delphi consensus study. 2019; 126: 83–93.
19. Organization WHO. *WHO recommendations on maternal and newborn care for a positive postnatal experience*. World Health Organization, 2022.
20. Jones I and Craddock N. Searching for the puerperal trigger: molecular genetic studies of bipolar affective puerperal psychosis. 2007; 40: 115.
21. Al Nasr RS, Altharwi K, Derbah MS, Gharibo SO, Fallatah SA, Alotaibi SG, Almutairi KA and Asdaq SMB. Prevalence and predictors of postpartum depression in Riyadh, Saudi Arabia: A cross sectional study. 2020; 15: e0228666.
22. Alasoom LI and Koura MR. Predictors of postpartum depression in the eastern province capital of Saudi Arabia. 2014; 3: 146.
23. Myers KR, Tham WY, Yin Y, Cohodes N, Thursby JG, Thursby MC, Schiffer P, Walsh JT, Lakhani KR and Wang D. Unequal effects of the COVID-19 pandemic on scientists. 2020; 4: 880–883.
24. Huguet A, Rao S, McGrath PJ, Wozney L, Wheaton M, Conrod J and Rozario S. A systematic review of cognitive behavioral therapy and behavioral activation apps for depression. 2016; 11: e0154248.
25. Jiménez-Serrano S, Tortajada S and García-Gómez JM. A mobile health application to predict postpartum depression based on machine learning. 2015; 21: 567–574.
26. AlHadi AN and Alhuwaydi AM. The mental health impact of pandemic COVID-19 crisis on university students in Saudi Arabia and associated factors. 2023; 71: 1854–1862.
27. Howard LM, Molyneaux E, Dennis CL, Rochat T, Stein A and Milgrom J. Non-psychotic mental disorders in the perinatal period. 2014; 384: 1775–1788.
28. Cassini A, Högberg LD, Plachouras D, Quattrocchi A, Hoxha A, Simonsen GS, Colomb-Cotinat M, Kretzschmar ME, Devleesschauwer B, Cecchini M and Ouakrim DA. Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis. 2019; 19: 56–66.
29. Guintivano J, Manuck T and Meltzer-Brody S. Predictors of postpartum depression: a comprehensive review of the last decade of evidence. 2018; 61: 591–603.
30. Cao S, Jones M, Tooth L and Mishra G. Does premenstrual syndrome before pregnancy increase the risk of postpartum depression? Findings from the Australian Longitudinal Study on Women's Health. 2021; 279: 143–148.
31. Tarricone R, Petracca F, Cucciniello M and Ciani O. Recommendations for developing a lifecycle, multidimensional assessment framework for mobile medical apps. Health Economics, 2022; 31: 73-97