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Technology-based Interventions to Reduce the Treatment Gap for Common Perinatal Mental Disorders in Low- and Middle-income Countries (LMICs): Challenges and the Way Forward

To the editor,

Low- and middle-income countries (LMICs) bear a high burden of common Perinatal Mental Disorders (PMDs) among parents.[1,2] These non-psychotic mental health conditions, including depression and anxiety, adversely affect day-to-day functioning and can be identified in primary care settings.[3] Untreated PMDs are associated with adverse obstetric and infant outcomes, such as abortion and stillbirth, which in turn lead to further negative mental health consequences for parents.[4,5] These outcomes are also associated with an increased risk of complicated grief, suicidal ideation, and marital disruption.[5] In LMICs, these prevalent PMDs remain largely undiagnosed and untreated, with low treatment contact coverage compared to high-income countries.[2,6,7] Moreover, a significant proportion of parents in LMICs are not routinely screened for the need for psychological support.[8] This is primarily the case due to a lack of evidence-based interventions and service models addressing the mental health needs of parents during the perinatal period.

Approaches to Reduce the Treatment Gap

To address this gap, the brief interventions and stepped care approach for screening, referral, and management of perinatal depression in resource-limited settings are promising approaches.[9,10] They may be adopted under existing healthcare settings, including Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) programs and National Mental Health Programs.[9] Brief interventions, including complementary health practices (CHPs) such as psycho-education, relaxation exercise, and health promotion techniques (e.g., sleep hygiene, dietary advice), can be delivered by primary health care workers (HCWs) (e.g., auxiliary nurse midwifes or Accredited Social Health Activists in India, and Thai village health volunteers in Thailand) or non-specialist HCWs in approximately 10–15 minutes with minimal training.[9,11] CHPs have shown effectiveness in reducing perinatal anxiety and grief among parents after stillbirth and fear of childbirth.[12] Additionally, primary HCWs-based models are effective, feasible, and scalable for integrative care, including screening, monitoring, and referral care. These models effectively improve the screening of perinatal women for depression using the Patient Health Questionnaire (PHQ-2 or PHQ-9) in tertiary care settings[13] and can be included as community-based assessments (e.g., Community Based Assessment Checklist in India) and part of national programs.[14] However, there are various challenges for the implementation of these interventions/models in resource-limited settings, including limited training resources, overburdened primary HCWs with multiple responsibilities under different programs, and difficulty maintaining records and arranging follow-ups. Most of these issues, however, can be addressed by innovative technology-based interventions.

Technology-based Interventions—Promising Solution

Innovative technology-based interventions, such as clinical decision support systems, mobile applications, and chatbots, can improve access to healthcare services.[15,16] They can support training and screening, surveillance, and monitoring.[17] They can also help in developing a comprehensive surveillance system at the primary level for detecting PMDs and providing digital brief psycho-social interventions. Innovative technology-based interventions can empower primary health care settings

to integrate and deliver antenatal/postnatal and MHC services as per national programs. For example, the digitalization of content (e.g., training resources, e-courses, mobile app, service model, a package of evidence-based intervention) can be made available for large-scale scaling-up in their respective states or other states with similar languages. The digital content will strengthen the skills of primary HCWs to perform risk assessments for PMDs and physical conditions, for example, using mobile apps. Furthermore, these digital tools may help bridge gaps in meeting needs, combating stigma, empowering perinatal women to take ownership of their own mental health, and providing customizable services.[18,19] It is important to acknowledge that adapting technology-based interventions in rural areas may be difficult due to multiple issues (e.g., technology illiteracy, and access to phones).[20] Still, in such circumstances, primary HCWs-based digital intervention may be beneficial.

These technologies can also support healthcare delivery. For example, people at elevated risk of screened conditions can be electronically referred to primary care doctors for medical review. Primary care doctors can then provide more complex decision support, including suggested medication management (as per national guidelines/programs). These technologies can also help deliver psycho-social interventions, and their delivery may be further improved by utilizing the Systematic Medical Appraisal, Referral and Treatment (SMART) framework.[21] The SMART framework is a primary healthcare "ecosystem" for resource-limited settings, primarily developed to manage common cardiovascular disorders in rural and remote Australia. The framework is based on three key principles: (a) prioritizing the needs of both users and providers, (b) evidence-based components or processes, and (c) accessible and affordable services to the community. The framework, supported by innovative technologies, has the potential to transform primary healthcare for a wide range of illnesses, including perinatal mental health in resource-constrained settings.

Additionally, using technology-based data collection can improve accuracy and enable monitoring of both service users and providers.[22] Technology-based interventions can be more cost-effective, acceptable, accessible, feasible, sustainable, and scalable than traditional interventions. Nevertheless, the effectiveness and scalability of these interventions are determined by factors such as their design, implementation, and local context.

The collaborative efforts of digital application developers and policymakers are needed to improve the effectiveness, accessibility, and efficiency of digital interventions in LMICs while addressing regulatory frameworks, ethics, and patient privacy.[23] Several countries (e.g., Ghana, India, Ethiopia,) have developed national strategies with specific goals, such as (a) improving service user participation through digital technology, (b) appointment to support treatment and follow-up, adherence, and real-time referral, (c) disease surveillance, (d) real-time disease information, (e) data exchange, (f) supply chain management, and (g) training and health education.[24,25] It is imperative to implement these approaches in other LMICs to improve the provision of perinatal mental health services.

Limitations of Technology-based Interventions

Technological interventions have the potential to promote health and self-management; however, this potential may not be realized in LMICs due to the current commercial ecosystem for users, developers, and regulators. The majority of available apps or digital interventions are market-driven, have limited functionality, and focus on providing information, tracking mood, self-monitoring, and giving reminders.[26] The rapid development of digital technology and its growing sophistication do not allow for the time required for standardized trials. In LMICs, comprehensive, multi-functional apps with evidence-based interventions, free, and linked with mental health professionals are still lacking. Most health apps are distributed directly to consumers and are frequently upgraded in response to customer demand, making them vulnerable to cybersecurity threats.[26] In addition, there are possible drawbacks or limitations of employing digital technologies such as the absence of a carer–client relationship, privacy, and connectivity issues in LMICs. Other issues include a lack of a regulatory agency or cultural appropriateness in the material used in digital technology. Regulatory authorities, if available, often overlook these modifications or, in some instances, there are delayed approval or rejection-related modifications. Therefore, finding a balance between evidence-based interventions and market applications is a serious issue; policymakers and stakeholders need to collaborate to reach more people in need with more accurate and efficient interventions.[15,16]

Conclusion

Technology-assisted interventions have the potential to improve the community-level identification, diagnosis, referral, and management of PMDs. They may increase access to care, thereby reducing the treatment gap for parents with common PMDs in primary healthcare settings in LMICs. However, it is necessary to consider the limitations of technology-based intervention and regulatory challenges in LMICs before implementing such interventions.

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