Smartphones and Mental Health Awareness and Utilization in Developing Countries: Focus Group Study

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Abstract

Background: Mental health disorders pose a significant challenge in low- and middle-income countries (LMICs), contributing substantially to the global disease burden. Despite the high prevalence of these disorders, LMICs allocate less than 1% of health budgets to mental health, resulting in inadequate care and a severe shortage of professionals. Stigma and cultural misconceptions further hinder access to mental health services. These challenges are present in Bangladesh, with high prevalence rates of depression and anxiety, a centralized and under-resourced mental health care system. Digital tools, such as smartphone applications and online platforms, offer innovative solutions to these challenges by increasing accessibility, cost-effectiveness, and scalability of mental health interventions.

Objective: This study aims to characterise the views around digital tools for mental health among residents of Korail, a major slum in Dhaka, Bangladesh, including the use of smartphones and investigate acceptable digital tools, and barriers and facilitators for digital mental health tools.

Methods: Eight focus groups (FGs) were conducted with 38 participants, including individuals with serious mental disorders and their caregivers. The FGs were transcribed, translated, and analysed using thematic analysis with NVivo 14 software.

Results: The findings revealed a general lack of awareness and understanding of digital mental health tools among slum residents. However, there was a notable appetite in these tools, recognising their potential to provide timely and cost-effective support, reduce hospital visits, and make healthcare more accessible. Participants highlighted the convenience and communication benefits of smartphones but expressed concerns about misuse such as excessive use, particularly among adolescents. Barriers to the utilisation of digital mental health tools included limited technological literacy and accessibility issues. Despite these challenges, participants acknowledged the potential of these tools to bridge the gap in mental health services, especially for those unable to travel. The importance of providing proper guidance and education to maximize the effectiveness of digital tools was emphasized.

Conclusions: Digital mental health tools hold promises for improving mental health care in underserved slum communities. This study underscores the need for further research and investment in tailored digital mental health solutions to address the unique needs of slum populations in LMICs.

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Background

Mental Health in LMICs

Mental health disorders significantly contribute to the global burden of disease, with 11.1% of the total burden in low- and middle-income countries (LMICs) attributed to mental health issues [1]. The World Health Organization (WHO) reports that unipolar depressive disorder, schizophrenia, and bipolar disorder are among the leading causes of disability in these regions[2]. Furthermore, substance use disorders, particularly alcohol use, account for a significant portion of the disease burden in LMICs[3]. Despite the high prevalence of mental health disorders, resources are severely limited (Rathod et al., 2017). Less than 1% of health budgets in many LMICs are allocated to mental health, resulting in inadequate care for the majority of those affected[4].

Mental Health in Bangladesh and Slums

Mental health disorders are prevalent in Bangladesh, affecting approximately 16.1% of the population[5], yet they are often underreported and inadequately addressed due to limited resources, infrastructure, and a severe shortage of mental health professionals, with only 0.5 psychiatrists and 0.2 psychologists per 100,000 people[6]. In urban slum areas like *Korail* in Dhaka, mental health disorders are disproportionately high due to adverse living conditions such as poverty, overcrowding, and lack of basic services, with prevalence rates 30-50% higher than in non-slum urban areas[7,8]. These environments are marked by high levels of violence, substance abuse, and chronic stress, exacerbating mental health issues while social support networks are often weak or absent, leading many to rely on informal support or go without care[9]. Efforts to improve mental health services, including policy initiatives and the establishment of mental health units in district hospitals, have been slow, with services often underfunded and lacking trained professionals[5]. This highlights the urgent need for innovative solutions to address mental health care in these regions.

Mental Health and Digital Tools

Digital tools, such as smartphone applications and online platforms, have been utilised to deliver mental health interventions such as cognitive-behavioural therapy and mindfulness training[10], provide psychoeducation, and offer support networks[11]. These tools can bridge the gap in mental health services, especially in regions with limited access to traditional mental health care[12]. Digital tools offer several advantages, including accessibility, cost-effectiveness,

and scalability[13]. Furthermore, digital platforms can facilitate self-monitoring and provide users with real-time feedback and support, enhancing the effectiveness of mental health interventions[14].

Evidence demonstrates that some LMICs have successfully adopted digital technology to raise awareness, screen, diagnose, and manage common mental health disorders for wider populations[13]. For instance, in India, mobile health (mHealth) initiatives have been used to deliver mental health services to rural and underserved populations, showing promising results in improving access and outcomes[15]. Similarly, in Kenya, digital platforms have been utilized to provide mental health education and support, significantly enhancing mental health literacy and reducing stigma[16]. A study in South Africa found that a mobile phone-based intervention for depression was effective in reducing symptoms and improving quality of life among participants[17]. Another example is the use of telepsychiatry in remote areas of Brazil, which has improved access to mental health care and reduced the need for travel to urban centres[18]. These examples highlight the potential of digital tools to address the mental health care gap in LMICs.

Digital tools can be particularly useful in impoverished communities like slums, where traditional mental health services are scarce[8], but smartphone ownership is vast[19]. However, understanding slum residents' perception of smartphones and digital tools for mental health is crucial for the successful implementation of these technologies. Perceptions influence the acceptance and utilization of digital interventions, and addressing concerns such as privacy, usability, and cultural relevance is essential[20]. Engaging communities in the design and implementation process can enhance the effectiveness and sustainability of digital mental health programs[21].

The research aimed to assess the views around digital tools for mental health among residents of the Korail slum, to identify the barriers and facilitators for the utilisation of digital mental health tools in this community and explore the potential benefits and challenges of implementing digital mental health interventions in slums.

Methods

Study Design

This study was approved by the University of Warwick Biomedical and Scientific Research Ethics Committee (BSREC 100/22-23). This research forms part of a larger collaborative research project on mental health in slums of developing countries[8]. This study employs a qualitative research design to explore perception on smartphones and use of digital tools for mental health among residents of the Korail slum in Dhaka, Bangladesh. The qualitative approach was chosen to gather in-depth insights into the participants' perceptions and attitudes towards digital tools for mental health. The study is part of a larger mixed-methods project aimed at understanding and predicting mental health relapse using digital phenotyping in LMICs.

Study Site and Participants

This study was conducted in Korail slum, Dhaka, Bangladesh, through group discussions with patients and caregivers. Korail is one of the largest slums in Bangladesh, located in the centre of the city, encroaching on parts Dhaka's most affluent neighbourhoods. The majority of Korail's population (estimated to be around 200 000)[22] subsist below the poverty line and work in low-income jobs. They have limited access to the city's healthcare services and there is little connection with the surrounding major roads[23]. Participants had to have been residents of the Korail slum, aged 18 years or older, and either diagnosed with a serious mental disorder (SMD) or caregivers of individuals diagnosed with SMD.

Data Collection

The focus group discussions were conducted in the Korail slum, within the established research office of the TRANSFORM Project[8]. The FGDs were structured to ensure a diverse representation of the community, including different genders, ages, and socioeconomic status. Each session was moderated by a trained facilitator, with the assistance of a note-taker. The moderator guided the discussions using a semi-structured topic guide, which included questions about mobile phone use, perceptions and familiarity to online mental health. The FGDs were

audio recorded in Bangla, the local language, to ensure accurate capture of the discussions. The recordings were then transcribed verbatim and translated into English. To maintain confidentiality, all personal identifiers were removed during transcription. The translated transcripts were reviewed by the research team to ensure accuracy and fidelity to the original conversations.

Data Analysis

The qualitative data from the FGDs were analysed using NVivo 12 software. A thematic analysis approach was employed to identify patterns and themes within the data. The analysis followed the five stages of data analysis described by Pope, Ziebland, and Mays (2000): familiarisation, identifying a thematic framework, indexing, charting, mapping and interpretation[24].

Each transcript was read multiple times to enhance familiarity with the data. Initial thoughts, reflections, and preliminary codes were noted. The transcript was then read again, and preliminary themes were recorded. Preliminary themes were subsequently grouped into clusters based on common features and meanings. These themes were validated by cross-checking with the transcript to ensure they accurately represented the data. This process was repeated for each transcript to maintain consistency. The themes from all transcripts were then compared and combined into master themes to create a comprehensive portrayal of the participants' experiences. The master themes were checked and re-checked against the transcripts to ensure they were well-represented and grounded in the data. Commonalities among the preliminary themes were identified and represented as sub-themes, reflecting lower-order aspects of the master themes. The final coding framework was reviewed and refined by multiple researchers to ensure reliability and validity. Discrepancies were resolved through discussion and consensus.

Results

Demographic Information

A total of eight focus group discussions (FGDs) were conducted, each group comprising of 4-6 participants who were either people with lived experiences or caregivers. The total number of participants for the eight FGDs was 38. The average age of participants was 37 years (± 13.7), mostly comprising of female participants.

Table 1. Participant demographic information (N=38)

Age (mean ±SD)	37 (± 13.7)
Gender, female (N, %)	30 (79%)
Education level (N, %)	
No education	5 (13%)
Primary	11 (29%)
Middle School	16 (42%)
Highschool	4 (11%)
Undergraduate	2 (5%)
Marital Status (N, %)	
Married	29 (76%)
Unmarried	4 (11%)
Widowed	4 (11%)
Divorced	1 (2%)
Employed (N, %)	
Yes	12 (32%)
No	26 (68%)
Smartphone Ownership (N, %)	

Yes	17 (45%)
No	21 (55%)
Average time of Smartphone ownership (years, mean ±SD)	3.33±1.15 years.
Smartphone Ownership in Family (N, %)	
Yes	35 (92%)
No	3 (8%)

Benefits and Challenges of Digital Tools

Overall, participants were familiar with digital tools for other parts of their lives and acknowledged its convenience with communication and banking. For instance, one participant mentioned, "Before we had to stand at the bank all day to withdraw disability allowance now it directly comes to the phone". Participants emphasized the importance of communication, video calls and messaging apps in maintaining relationships, especially with family members living abroad and the ability to access news and information through social media platforms like Facebook and WhatsApp was also highlighted as a significant benefit. One stated, “"People before used to send letters to seek updates, it took time to hear back. Now it is easy to know about people” and another participant said "If you go somewhere far away you can still communicate... Now they can talk on WhatsApp if they have a smartphone”.

Participants highlighted various ways in which smartphones can be misused, particularly by adolescents. Concerns were raised about inappropriate content, the facilitation of risky behaviours, and negative impacts on academic performance. Others highlighted concerns about addiction, particularly among the younger generation, as children and teenagers spend excessive amounts of time on their phones, often at the expense of studying or socializing with family. One participant remarked, "Every kid is so busy playing games it seems that they have no time to pick up the call from family". One young-adult participant stated, "Most people our age is seen on their phones till 1 to 2 am, not waking up before 10 am". This excessive use was linked to sleep disturbances, as many young people stay up late using their devices, with a participant noting, "Children prefer playing games on their phones rather than studying". Another participant expressed frustration with the excessive gaming and its impact: "Every kid is so busy playing games, it seems that they have no time to pick up the call from family".

Digital Tools for Mental Health

Despite familiarity of digital tools, awareness of digital mental health tools was generally low among the participants. Many were unaware of the existence of apps and online services designed to provide mental health support. One participant stated simply, "I have no idea" when asked about health services through phones. Another echoed, "No, I don't know" about apps for mental health. This lack of knowledge extended to the potential benefits of such tools, with several participants indicating that they had never used or even heard of mental health apps, "No, I have never used any such app". However, one participant shared, "I once spoke to an Indian doctor through an app. He told me how to talk to my sister-in-law, how to behave, all of this"

Despite the potential of digital tools, many participants preferred traditional methods of seeking mental health care. They commonly visited doctors in person and relied on face-to-face consultations for treatment and advice. One participant shared, "We go to a doctor; the doctor gives one month of medicine". This preference was attributed to the trust and reassurance that comes with direct interaction with healthcare professionals. Another participant mentioned, "We directly communicate with the doctor; no service was ever taken over the phone”.

While most participants had limited experience with online consultations, there was a general interest in exploring this option. Some expressed the view that online consultations could **save time and reduce the costs** associated with traveling to healthcare facilities. One participant noted, "Online consultations could save us a lot of travel time and cost". The convenience of **receiving medical advice from home** was highlighted, especially for those with mobility issues or residing in remote areas. The potential of health apps to provide immediate assistance and support was recognized by several participants. They suggested that **applications could offer valuable information on managing mental health conditions**,

including treatment schedules and medication reminders, with one stating, "If counselling, doctor's advice, what kind of treatment should be given to them can be provided (through phones), it would be good". Participants also noted that health apps could serve as a **resource for caregivers,** providing guidance on how to care for individuals with mental health issues, "health apps can guide us on how to care for our loved ones better". Another participant reflected on the need for such tools, saying, "It would be great if there is a service available through the app for such problems", acknowledging the limitations they face in accessing in-person services. Caregivers also recognized the potential benefits of digital tools in **guiding them on how to care** for individuals with mental health issues: "Health apps can guide us on how to care for our loved ones better." This indicates that digital tools can serve as valuable resources for those supporting individuals with mental health challenges. The general sentiment was positive towards the potential of these services, with one participant mentioning, "If I get advice from a good doctor from home, it will be good", and another stating, "Consulting a doctor through an app can be very helpful".

Potential Challenges

Despite widespread appetite for digital mental health tools, participants acknowledged challenges such as the digital divide, lack of technological literacy, and concerns about the reliability of online services were also mentioned. One participant highlighted, "It saves time and travel costs but not everyone knows how to use the apps properly". Another added, the importance of addressing these challenges to ensure the successful implementation of digital mental health interventions was emphasized, "It will be good, but we need proper guidance on how to use these services". Participants also expressed concerns about the usability of these tools for older family members, stating, "It can be challenging to teach older family members how to use health apps." The need for user education and support to maximize the effectiveness of these digital tools was stressed. Furthermore, Participants discussed the risks for mentally ill individuals using digital tools. One participant shared an experience: "When my sister-in-law was sick and had the phone on her, she used to make such bad comments, leave bad images, and she used to make very bad posts on people's profiles". Another participant emphasized the potential risks: "Mentally ill patients can do many things on the phone without realizing it... Harassment can be due to political reasons". These accounts highlight the importance of considering the specific vulnerabilities of certain user groups when developing and implementing digital health interventions. Ensuring that appropriate safeguards and support mechanisms are in place is crucial to mitigate these risks.

Discussion

Principal Results

The findings reveal a general lack of awareness and understanding of digital mental health tools among the residents of the Korail slum. Many participants were unaware of the existence of apps and online services designed to provide mental health support, which highlights a significant gap in mental health literacy within the community. Despite this lack of awareness, there was a noticeable interest in the potential of digital mental health tools, with participants acknowledging that these tools could provide timely and cost-effective support, reducing the need for frequent hospital visits and associated expenses.

Several barriers to the utilization of digital mental health tools were identified, including technological literacy and accessibility. The digital divide was a prominent concern, with participants highlighting the lack of technological literacy as a significant barrier. This issue is compounded by the challenges of teaching older family members how to use these tools. Additionally, concerns about the reliability and effectiveness of online services were mentioned and traditional doctor visits are still preferred by many due to the trust and reassurance that comes with face-to-face interactions[25].

Despite these barriers, several facilitators to the utilization of digital mental health tools were identified. Participants recognized the potential of these tools to make healthcare more accessible, especially for those who cannot travel. This reflects the potential for digital tools to bridge the gap in mental health services, particularly in underserved areas like slums. The study also highlighted the importance of providing proper guidance and education on using these services. Participants stressed the need for user education and support to maximize the

effectiveness of digital tools. This suggests that initiatives aimed at improving technological literacy and providing support could significantly enhance the adoption and effectiveness of digital mental health interventions[16].

Limitations

Despite the valuable insights provided by this study, several limitations need to be acknowledged. Firstly, the study was conducted in a single slum community in Dhaka, Bangladesh, which may limit the generalisability of the findings to other slum areas or LMICs with different socio-cultural contexts[26]. The sample size, though sufficient for qualitative analysis, is relatively small (n=38), and larger studies would be needed to validate these findings across diverse settings[26]. Secondly, the study relied on self-reported data from focus group discussions, which may introduce biases such as social desirability bias, where participants might overstate positive aspects or underreport negative aspects to conform to perceived expectations[16]. Additionally, the lack of awareness and understanding of digital mental health tools among participants could have influenced their responses, potentially limiting the depth of insights regarding the barriers and facilitators to utilizing these tools[20]. Technological literacy was identified as a significant barrier, yet the study did not quantitatively assess the participants' actual proficiency with digital tools. This gap indicates a need for future research to include objective measures of technological literacy to better understand this barrier[11]. While this study provides foundational insights into the awareness and perceptions of digital mental health tools in a slum setting, its limitations highlight the need for further research to expand these findings and address the identified gaps.

Comparison to Prior Work

The findings of this study align with previous research indicating the potential of digital tools to improve mental health services in low-resource settings. Similar to Mohr et al. (2013)'s study, which demonstrated the effectiveness of digital interventions in LMICs, our results suggest that digital mental health tools could provide significant benefits in underserved communities, such as the Korail slum in Dhaka. However, unlike the widespread adoption seen in other regions[16], the participants in our study displayed a notable lack of awareness and technological literacy, highlighting a crucial gap that must be addressed to replicate the success of these interventions. Furthermore, the barriers identified in our study, including concerns about usability and trust in digital platforms, resonate with the challenges noted by Torous et al. (2018) and Naslund et al. (2016), underscoring the need for targeted educational initiatives to enhance the effectiveness and adoption of these tools in slum settings.

Conclusion

This study shows people with lived experience are receptive and interested in the transformative power of digital tools for mental health care in slum settings like *Korail*. However, for these tools to be effective, it is crucial to address the existing barriers and provide adequate support and education to users. By doing so, digital interventions can become a significant solution to the mental health care challenges faced by underserved communities in low- and middle-income countries. The findings highlight the need for further research and investment in digital mental health solutions tailored to the unique needs and contexts of slum populations.

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Abbreviations:
FGD: Focus Group Discussion

HIC: High-Income Country
LMIC: Low- and Middle-Income Country
SMD: Serious Mental Disorder

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