
Mobile Phone based Interactive Videos for Perinatal Depression

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Abstract

Uni-polar disorders, including perinatal depression, have been identified as some of the major mental health challenges facing the globe. In low and middle-income countries it is estimated to be the leading mental health-related cause of disability-adjusted life years lost. In Pakistan, where it is estimated that one-in-four women suffers from perinatal depression, and less than a third of the female population is educated, the problem assumes additional public health significance. Evidence-based interventions to address this issue exist, but are administered using paper manuals by female health workers who because of cultural constraints cannot provide information to male members of a household. To address these challenges, this project proposes two important innovations: 1) a culturally tailored, evidence-based psycho-educational intervention delivered by both male and female community health workers; and 2) delivering the intervention through mobile phone-based interactive videos. Interactive video is an emerging concept that makes it possible for people viewing a video to make choices that impact what they see. These technologies offer a level of engagement and interactivity not found in many other forms of communication and the ability to use a mobile platform enhances reach. This project will engage community health workers with focus on

the interpersonal communication outcomes of an mHealth intervention.

Author Keywords

MHealth; Perinatal; Depression; MCH; Pakistan; Interactive Videos; Cognitive Behavior Therapy; CBT; Communication; ICT4D; HCI4D; CHW.

ACM Classification Keywords

J.3. Computer Applications: Life and Medical Sciences; Health.

Introduction

Global mental health is a priority in the global health initiative ⁽¹⁾. Depressive disorders in particular are common ⁽²⁾, chronic ⁽³⁾ and a significant source of disability, especially among women ⁽⁴⁾ particularly perinatal depression ⁽⁵⁾. Common depressive disorders, particularly perinatal depression in women, can be chronic and are a source of significant disability. Depression not only can have adverse effects upon mothers but also upon children ⁽⁶⁾. Children of depressed mothers risk poorer cognitive development ⁽⁷⁾, poor attachment, ⁽⁸⁾ low birth weight, under nutrition, higher rates of diarrhea, and lower rates of immunization ⁽⁹⁾. Growth of psycho-social research in this area is critical given the high burden of mental health disorders. Because of limitations of the health care system and cultural norms associated with seeking treatment for mental health disorders, tackling perinatal depression in low and middle income countries (LMICs) such as Pakistan can be accomplished through innovations in intervention design and delivery ⁽¹⁰⁾. Communication technologies can play a significant role in addressing depressive disorders, however, rigorous research is needed to

determine the efficacy of various approaches ⁽¹¹⁾. Along with technological innovation, leveraging community health workers (CHWs) in LMIC can overcome system-level barriers to provision of care. This proposal specifically explores the efficacy of an mHealth intervention using interactive videos by CHWs; harnessing the significant power of mobile communication technology to facilitate CHWs work in a specific cultural context.

Proposed Innovation and Objectives

This project is transformative in that it leverages a new communication technology i.e., interactive videos. The project sets out to create and to research the efficacy of an interactive video, designed to complement Cognitive Behavior Therapy (CBT)-based content of an existing evidence-based psycho-educational intervention. Author of this proposal is in contact with developers of a psychosocial educational intervention and aims to present a demo interactive video at the HCI4D workshop 2016.

The interactive video intervention will be delivered by CHWs on a mobile phone platform. It is being developed based on the significant existing evidence that communication interventions are more effective when they are structured as a dialogue rather than as a one-way transfer of facts from experts to the public, ⁽¹²⁾ and that interventions that blend entertainment with educational content will be more influential than education only ⁽¹³⁾. Interactive video technology will help structure the intervention content and provide interactivity that can help CHW share intervention content with women and their families.

The proposal has two objectives:

1. To develop a tailored, mobile, interactive video adaptation of an evidence-based cognitive behavioral intervention based on formative research findings.
2. To evaluate the efficacy of the interactive video intervention for improved patient-CHW communication, perceived family awareness and support, and appropriate help-seeking in the target community.

Cognitive Behavior Therapy

Evidence from developed nations shows that psychotherapeutic approaches, including CBT, interpersonal therapy, or problem solving, are effective treatments for depression ⁽¹⁴⁾. Given the nature of the healthcare systems in many countries, placing responsibility for these interventions on more available and affordable members of the health workforce or community is widely acknowledged to be the only long-term way of addressing this obstacle ⁽¹⁵⁾. A series of randomized clinical trials to test the efficacy of mental health counseling interventions by local lay counselors, with little to no previous mental health training or experience, has demonstrated positive findings for mental health and functioning outcomes ⁽¹⁶⁾, ⁽¹⁷⁾ and ⁽¹⁸⁾. In Pakistan, a study ⁽¹⁹⁾ demonstrated that primary health care staff who are not trained in mental health can be trained quickly to implement client-based intervention content informed by the principles of CBT, with strong results. A critical barrier to accessing such care is the stigma and lack of awareness of the condition among women and their families (20). This proposal addresses this barrier by developing, and

evaluating the feasibility of a mobile phone-based psychoeducational intervention that can be delivered by CHWs to female and male members of rural households. The use of the mobile platform overcomes a number of the access issues that are inherent in the health system in Pakistan and provides a mechanism to reach women and their families who might not otherwise engage with the health-care system because of awareness or the stigma associated with mental health issues. This project is significant because it extends the existing work by including male health workers as part of the delivery team, and is designed to provide initial evidence for its effectiveness.

Lessons to be Learned Across Borders

Mental health is a universal concern. Even after geographical and cultural differences, the basics of mental illnesses remains consistent across borders. The biggest concern is indeed an acute shortage of trained counselors and therapists. Even when they are available, it is often very expensive for people with low-income to access them. The problem is further exacerbated by natural and man-made disasters. In past years, thousands of people have been forced to migrate and live in refugee camps because of floods, earthquake or wars and conflicts. They have faced immense mental trauma that was completely unexpected. Technology offers a glimmer of hope. Specifically, mobile phone based interventions can provide basic mental relief with an added advantage of low-cost intervention. Additionally, the affected population, specifically women, can be reached in the privacy of their homes, thus addressing the concerns of stigma and stereotypes associated with mental illnesses in many countries. All these reasons offer considerable opportunities for this project to be translated and

adapted in countries outside Pakistan with little modification in language and adjusting cultural sensitivities.

Interactive Videos

The interactive video, also known as next-generation video or detail-on-demand video, is “the use of computer systems to allow proactive and random access to video content based on queries or search targets”⁽²¹⁾. Interactive video interventions have been used for interpersonal skills training in organizations, enhancing presentational skills, and in educating pastoralists with positive results^{(22) (23) (24)}. Unlike a traditional linear video that consists of a largely passive role, an interactive video is a digitally enriched video. It presents new forms of influence and navigation in the video and additional contents such as images, commentary, text, audio tracks, and voiceover that can be added to the original scenes. Given recent advances in multi-media technologies, interactive videos can now be played on smart phones, tablets, and touch-sensitive surfaces.

Interactive videos offer a unique solution toward improving communication between CHWs and community members around perinatal depression and may be one way to democratize access to mental health intervention content. Importantly, these technologies offer a level of engagement and interactivity not found in many other forms of communication because the technology allows for the co-creation of narratives about mental health. Interactive videos allow for client-driven interactions including the ability to affirmatively shape, arrange, and optimize information regarding the way clients think⁽²⁵⁾. Such an intervention should enhance the

dialogue between CHW and mother as well as other family members because mental processes can be aided and simplified by reducing the number of elements to be memorized by the CHW, by reducing the number of necessary mental processing steps, and by making the entire process more reliable⁽²⁶⁾. When learners have control over their learning they tend to exhibit greater engagement. At the same time, when the learners are challenged and committed to the learning process, they are active. As a result, the cognitive system is utilized effectively⁽²⁷⁾.

Beyond the potential benefits to users, interactive videos used on mobile platforms offer the possibility of other benefits to intervention implementation. Because the intervention can be contained and tracked within the mobile device, it should enhance fidelity between intervention content and delivery. Interactive video doesn’t require special technical skills to operate. Additionally, the one-time cost of video production and ability for rapid transfer from concept to delivery add to the appeal of this innovation for mHealth delivery. Interactive videos also provide long-term benefits in terms of CHW training and capacity building including the ability to reach a large number of CHWs in less time, improved training effectiveness through audio/visual teaching aids, delivering a consistent message to all CHWs, gathering critical feedback immediately for improvements in intervention content, and delivery through diagnostics availability on mobile technologies.

Mobile Penetration in Pakistan

Pakistan is the world’s sixth most populous country with a population of over 190 million. It is a low income country with a per person annual income of less than

\$500, and 33% of the population living below poverty line ⁽¹⁰⁾. Pakistan remains stuck in a low-income, low-growth trap, with growth averaging about 3% per year from 2008 to 2012 ⁽²⁸⁾. The country has also faced a series of natural disasters and internal conflicts in past seven years, which further exacerbated the public health situation. Globally, the country has the third and second highest rates of newborn mortality and stillbirths respectively;⁽²⁹⁾ ⁽³⁰⁾ its rate of progress in achieving the targets for the Millennium Development Goals (MDGs) 4 and 5 have been slow ⁽³¹⁾. The country has a vast and diverse landscape of almost 800,000 km² and huge differences between its six provinces and the Federally Administered Tribal Areas in resources, access, and development. Yet, significant segments of the population have access to mobile technologies. The exponential growth of mobile phones over the past decade in Pakistan offers a new avenue for the promotion of quality healthcare. Currently, Pakistan is one of the fastest growing telecommunication markets in the world. According to Pakistan Telecommunication Authority annual report 2013 ⁽³²⁾, teledensity of the country has reached 75% (135 million subscribers). Mobile penetration has reached to 71% with 128 million subscribers at the end of June 2013. Cellular operators cover 92% of the land area via 35,889 cell sites across Pakistan. Rapid technological advancements and increasing demand have made it possible for mobile phone manufacturers to produce low-cost mobile devices and intense competition between mobile service providers has also led to cheaper call rates. In Pakistan, like much of the world, the mobile phone has become an essential part of peoples' lives. Mobile platforms allow for immense possibilities for delivery of health interventions ⁽³³⁾; interactive video is one powerful tool for bridging

entertainment and education for behavioral intervention.

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