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Augmenting mHealth with human support: Notes from community care of people with serious mental illnesses

Geneva Kay Jonathan¹, Lupita Pivaral², and Dror Ben-Zeev³

¹Departments of Psychiatry and Biomedical Data Science, Geisel School of Medicine at Dartmouth College, Hanover NH, USA

²Thresholds, Chicago IL, USA

³Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle WA, USA

Abstract

Topic—This article describes the activities of two *mHealth specialists* who supported the deployment of FOCUS – a smartphone self-management application for individuals with serious mental illnesses.

Purpose—Several support activities have been identified as potentially advantageous for individuals using mHealth interventions: facilitation of user engagement, data utilization to enhance care, and promotion of meaningful use. We present three examples to demonstrate the implementation of these activities during a 12-week smartphone intervention.

Sources Used—The personal experiences of two mHealth specialists are shared within the context of three examples of individuals who participated in the smartphone intervention.

Conclusions and Implications for Practice—The application of these support activities highlights the future opportunities that mHealth interventions could offer to individuals with serious mental illnesses and their providers. Additionally, these examples call for conversation about technology support roles and where they belong in the context of community-based care.

Introduction

Mobile Health (mHealth) refers to the use of mobile technologies such as smartphones, wearables and other mobile devices in support of healthcare. mHealth has become increasingly popular in mental health treatment and services. mHealth interventions allow individuals seeking mental health resources easy access to psychoeducation and self-care techniques as well as an opportunity to track and self-manage their symptoms.

Several studies have shown that human support can enhance mHealth intervention potency and longevity (Newman et al., 2011; Ben-Zeev et al., 2016a). Support activities that have been identified as potentially advantageous are: facilitation of user engagement, data utilization to enhance care, and promotion of meaningful use (Brunette et al., 2016; Ben-Zeev et al., 2015).

This article describes the experiences of two *mHealth specialists* (i.e., human support personnel that help users interact with mHealth technologies) who supported the deployment

throughout a 12-week randomized controlled trial of FOCUS – a smartphone self-management intervention for individuals with serious mental illnesses (Ben-Zeev et al., 2014; Ben-Zeev et al., 2013; Ben-Zeev et al., 2016b). FOCUS provides tips and skills on mood regulation, coping with voices, medication use, social functioning, and sleep. We provide concrete examples of how support activities took form in the context of community-based care.

Facilitating User Engagement

User engagement is key to ensuring that individuals are exposed to the content of an mHealth intervention (Schueller et al., 2016). In our FOCUS deployments, engagement was defined as the number of times a user interacts with the intervention in a 7-day period. The mHealth specialists facilitated engagement by encouraging users to take full advantage of the tools and lessons FOCUS provides. First, the mHealth specialists met with users in person to build rapport and establish a collaborative relationship. During this initial meeting, individuals were given smartphones with an active data plan. Next, the mHealth specialists explained their role to users and gave a tutorial on how to use the device (e.g., using a touchscreen, making calls, setting the volume) and the intervention (e.g., exploring modules, responding to prompts, selecting self-management tools). After the initial meeting, the relationship continued via weekly phone calls in which users were encouraged to bring up technical issues, ask questions, and share anecdotes about their experiences integrating the mHealth intervention into their day-to-day routine. To increase engagement, the mHealth specialists helped users identify situations where the app might provide additional support. If users had trouble engaging with the intervention, the mHealth specialists would assign activities related to intervention use (e.g., encouraging users to write down tips to make them easier to recall) or initiate a discussion about barriers to use. The mHealth specialists implemented these support activities with the rationale that the more users logged into and explored the app, the greater the likelihood that they would expose themselves to diverse intervention content.

Example 1: A 60-year-old individual with major depression and a substance addiction used FOCUS to manage and stay on top of his symptoms. Upon starting the intervention, the user was anxious about using a smartphone because he had no prior experience. The user's first few weeks with the intervention was a period of learning (e.g., gaining experience in device use) and adjustment (e.g., getting accustomed to carrying around a smartphone). Data transmitted from the FOCUS system to a clinician dashboard showed that in the first month of deployment, he was interacting on average 35 times a week (approximately 5 times daily) for mood and social advice. In an effort to motivate the user to reflect on his app use, the mHealth specialist encouraged him to write down his experiences using the intervention. With continued practice and coaching, the user began to disclose more intimate details about his use during the weekly calls, such as describing how he replaced maladaptive substance use with breathing exercises during periods of anxiety. Throughout the last two months of the intervention, his weekly use increased up to 54 interactions per week (approximately 7.8 times a day) in all content areas of the app: mood, sleep, medication, social, and voices.

The user's increased use over time suggests that remote, weekly support could help users engage more frequently with mHealth interventions. Despite minimal face-to-face interaction, the mHealth specialist was able to support the users' efforts to tackle sensitive symptom target areas; ultimately helping the user achieve greater independence.

Leveraging Data to Enhance Care

mHealth technologies create new forms of data, such as passive (e.g., device use, accelerometry) and active data (e.g., user self-report information) that are not typically available to clinicians. FOCUS data, stored and summarized on a secure dashboard, are updated in realtime and can reveal information about a user's current state. The mHealth specialists used these new forms of data to inform their discussions with users as well as link their needs to tools from the app.

Example 2: A 68-year-old individual with schizophrenia interacted with FOCUS about 419 times throughout the 12-week intervention. This gave the mHealth specialist approximately 35 data points, or distinct snapshots of the user's functioning and well-being to reference during the weekly call. One week, the user self-reported on the app that she was experiencing extremely bothersome auditory hallucinations for three consecutive days. Originally, she did not endorse auditory hallucinations during her introductory meeting with the mHealth specialist. However, the mHealth specialist was able to see that about a third of her interactions with FOCUS (31%) pertained to them. Each interaction was coupled with timestamps on the dashboard (i.e., the exact date and time the user used the app) which allowed the mHealth specialist to identify a pattern of negative responses and follow up during the next scheduled call. During the call, the mHealth specialist inquired about the user's self-report data and discovered that the user was unable to sleep due to increased symptoms (e.g., persistent command hallucinations) and chronic back pain. The interaction was an unconventional opportunity for the mHealth specialist to help her incorporate cognitive restructuring and medication adherence strategies from FOCUS into her daily routine. In the following week, the user reported that she worked with her clinician to increase the dosage of her medication and further practice questioning the validity of hallucination content. Shortly after, the mHealth specialist noticed a significant decline in the user's self-reported distress associated with voices.

The real-time data that FOCUS provided gave the mHealth specialist a chance to intervene and respond to a time-sensitive matter in a way that would not be possible in traditional care. Users also have an opportunity to seek assistance for symptoms that they may be too embarrassed or intimidated to share face-to-face with their clinician. If users did not endorse specific symptoms or offered limited details about their progress during weekly calls, the mHealth specialists were able to reference the user's data to start a conversation.

Supporting Meaningful Use

Though a user might frequently engage with an mHealth intervention, quantity of use does not always translate to meaningful and effective use (e.g., the user may review a self-management tip but choose not to use it because it is difficult to execute). Subsequently, a

user's ability to connect his or her personal experiences to an mHealth intervention's content can influence their long-term utility (Schueller et al., 2016; Smith et al., 2014). The mHealth specialists used weekly calls to help users implement the tips they were learning from the app, especially in cases where users felt the tips were not tailored to their needs.

Example 3: A 52-year-old individual with schizoaffective disorder endorsed isolative habits during his introductory meeting with the mHealth specialist. He planned to use FOCUS to seek tips to overcome his social anxiety. On one occasion, he received a suggestion to join a volunteer group or club to meet people. During his weekly call, he expressed to the mHealth specialist that he was struggling to apply the suggested tip. Using motivational interviewing, the mHealth specialist was able to draw out more information (e.g., he did not want to try the tip because he was uncomfortable with long conversations and groups of people) and help him brainstorm how to maintain the aspect of connecting with other people but in a manner that would be more consistent with his preferences. After discussing the user's interest in physical activity, the mHealth specialist and user agreed that joining a gym would be a preferred alternative. Later that week, the user secured a gym membership with the help of his case manager and the mHealth specialist dedicated his remaining calls towards supporting his use of social skills from the app in the gym environment.

The interaction served a dual purpose; it added flexibility to the intervention content and it kept a user, who might otherwise have stopped using FOCUS due to lack of relevance, engaged. Novel elements of artificial intelligence and machine learning that help tailor current technology do not yet fulfill this need for mHealth interventions. As shown in this example, roles like the mHealth specialist may be needed to enhance mHealth personalization.

Conclusion

mHealth interventions have the potential to revolutionize the way we prevent, diagnose and monitor serious mental illnesses. Given the ubiquitous nature of mobile phones, these novel technologies can reach anyone, anytime and anywhere. mHealth interventions, like FOCUS, are well-positioned to help expand resources to individuals who up until now have had limited access to services due to cost, availability and location. However, the adoption of mHealth into community-based care is not without challenges.

Adoption among healthcare professionals will be linked with their perceived usefulness (e.g., belief that a device will be advantageous in practice) followed by ease of use (e.g., belief that utilization of mHealth will be painless and effortless) (Gagnon et al, 2016). Additionally, many of the mHealth technologies developed for mental health – primarily smartphone apps – remain unsupported by research, creating further skepticism among providers about their utility (Anthes, 2016). Users of these tools fail to adopt them into their routine due to poor usability and lack of relevance towards their personal needs (Price et al, 2014). mHealth interventions that are augmented by human support may provide practical solutions to many of these adoption challenges. The technology can help users provide their clinicians with a more comprehensive view of their day-to-day experiences and in turn, they

receive more personalized feedback without the stigma or frequent trips associated with going to a clinic.

Moving forward, it is important to consider where these kinds of human support roles will exist within the context of community-based care. We encourage mental health care providers and administrators to keep an open mind towards the use of mHealth interventions and the new opportunities they allow. Additionally, providers can be trained on safe and effective practice and integration of these approaches, regardless of whether or not they intend to adopt them in their own practice. As the popularity for mHealth continues to grow, further research is needed to determine the value and utility of human support personnel in enhancing user engagement, and use adherence and acceptability of mHealth interventions.

References

- Anthes E. Mental health: There's an app for that. *Nature*. 2016; 532:20–23. <http://dx.doi.org/10.1038/532020a>. [PubMed: 27078548]
- Ben-Zeev D, Kaiser SM, Brenner CJ, Begale M, Duffecy J, Mohr DC. Development and usability testing of FOCUS: A smartphone system for self-management of schizophrenia. *Psychiatric Rehabilitation Journal*. 2013; 36:289–296. <http://dx.doi.org/10.1037/prj0000019>. [PubMed: 24015913]
- Ben-Zeev D, Brenner CJ, Begale M, Duffecy J, Mohr DC, Mueser KT. Feasibility, acceptability, and preliminary efficacy of a smartphone intervention for schizophrenia. *Schizophrenia Bulletin*. 2014; 40:1244–1253. <http://dx.doi.org/10.1093/schbul/sbu033>. [PubMed: 24609454]
- Ben-Zeev D, Drake R, Marsch L. Clinical technology specialists. *British Medical Journal*. 2015; 350:h945. <http://dx.doi.org/10.1136/bmj.h945>. [PubMed: 25697164]
- Ben-Zeev D, Scherer EA, Gottlieb JD, Rotondi AJ, Brunette MF, Achtyes ED, Mueser KT, Gingerich S, Brenner CJ, Begale M, Mohr DC, Schooler N, Marcy P, Robinson DG, Kane JM. Mobile health (mHealth) for schizophrenia: patient engagement with a mobile phone intervention following hospital discharge. *Journal of Medical Internet Research Mental Health*. 2016a; 3:e34. <http://dx.doi.org/10.2196/mental.6348>.
- Ben-Zeev D, Brian RM, Aschbrenner KA, Jonathan G, Steingard S. Video-based mHealth interventions for schizophrenia: Bringing the “pocket therapist” to life. *Psychiatric Rehabilitation Journal*. 2016b. <http://dx.doi.org/10.1037/prj0000197>
- Brunette MF, Ferron JC, Gottlieb J, Devitt T, Rotondi A. Development and usability testing of a web-based smoking cessation treatment for smokers with schizophrenia. *Internet Interventions*. 2016; 4:113–119. <http://dx.doi.org/10.1016/j.invent.2016.05.003>.
- Gagnon MP, Ngangue P, Payne-Gagnon J, Desmarts M. m-Health adoption by healthcare professionals: a systematic review. *Journal of the American Medical Informatics Association*. 2016; 23:212–220. <http://dx.doi.org/10.1093/jamia/ocv052>. [PubMed: 26078410]
- Newman MG, Szkodny LE, Llera SJ, Przeworski A. A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: is human contact necessary for therapeutic efficacy? *Clinical Psychology Review*. 2011; 31:89–103. <http://dx.doi.org/10.1016/j.cpr.2010.09.008>. [PubMed: 21130939]
- Price M, Yuen EK, Goetter EM, Herbert JD, Forman EM, Acierno R, Ruggiero KJ. mHealth: a mechanism to deliver more accessible, more effective mental health care. *Clinical Psychology & Psychotherapy*. 2014; 21:427–436. <http://dx.doi.org/10.1002/cpp.1855>. [PubMed: 23918764]
- Schueller SM, Tomasino KN, Mohr DC. Integrating human support into behavioral intervention technologies: The efficiency model of support. *Clinical Psychology: Science and Practice*. 2016; 4:1–19. <http://dx.doi.org/10.1111/cpsp.12173>.
- Smith KL, Kerr DA, Fenner AA, Straker LM. Adolescents just do not know what they want: a qualitative study to describe obese adolescents' experiences of text messaging to support behavior

change maintenance post intervention. Journal of Medical Internet Research. 2014; 16:e103. <http://dx.doi.org/10.2196/jmir.3113>. [PubMed: 24713407]

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