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Mobile Technologies Among People with Serious Mental Illness: Opportunities for Future Services

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Abstract

Several national bodies have proposed using mobile technology to improve mental health services. But rates of current use and interest in using technology to enhance services among individuals with serious mental illness are uncertain. The authors surveyed 1,592 individuals with serious mental illness regarding their use of mobile devices and interest in using mobile technologies to enhance mental health services. Seventy-two percent of survey respondents reported currently owning a mobile device, a rate approximately 12 % lower than the general adult population. The most common uses were for talking, followed by texting, and internet activities. Both mobile device users and nonusers expressed interest in future mobile services.

Keywords

Serious mental illness; Mobile health (mhealth); Health technologies; Psychiatric rehabilitation

Introduction

Effective use of technologies may facilitate a transformation of mental health services in the years ahead (Institute of Medicine 2006; New Freedom Commission on Mental Health

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2003). Mobile technologies, such as cellular phones and smartphones, show particular promise to improve existing services, and provide new avenues for the administration of innovative psychosocial treatments (Heron and Smyth 2010). Contemporary mobile devices are light-weight, increasingly easier to operate, and have been precipitously dropping in cost. Infrastructure for mobile telecommunications has developed rapidly over recent years and approximately 90 % of the world's population is now covered by a mobile cellular signal (ITU 2011). The confluence of these factors creates opportunities for implementation of services well beyond the confines of a physical clinic or treatment center, as well as for broad dissemination of information and resources (WHO 2011).

Serious mental illnesses (SMI) such as schizophrenia, schizoaffective disorder, and bipolar disorder cause significant functional impairment (Kessler et al. 2003) and are among the leading causes of disability worldwide (Murray and Lopez 1996). Interest in using mobile technologies in the assessment and treatment of SMI is growing rapidly (Ben-Zeev 2012; Depp et al. 2010). While mobile devices are ubiquitous and used for an array of functions in the general population (Pew Research Center 2011), their penetration among populations with SMI is uncertain. Research on access, utilization, and interest in mobile technologies could inform how existing consumer habits can be leveraged, and resources needed for broad implementation (Ben-Zeev et al. in press). In addition, determining what type of services would be acceptable and of greatest interest to consumers is an important step in designing interventions that will be both appealing to systems of care (i.e. cost effective, clinically informative), while addressing real-world consumer needs.

The primary purpose of this study was to survey people with SMI regarding current use of mobile technologies. A secondary purpose was to explore what type of services they would be interested in receiving from providers via mobile devices in the future.

Methods

The study was conducted at *Thresholds*, a large psychiatric rehabilitation agency that provides comprehensive mental health and rehabilitation services for individuals with SMI throughout the greater Chicago area. Thresholds programs vary in the structure and intensity of services provided. These include community-based case management and linkage to resources, supported employment, psychiatric care, psychotherapy and illness management programs, and housing. Direct service staff surveyed 1,592 consumers (58 % of individuals receiving services at the time). The survey was conducted as part of a broader 2011 initiative to explore mobile health (mHealth) options for treatment provision in community settings. The study was approved by the Dartmouth College and Thresholds' Institutional Review Boards. Consumers answered questions about their ownership and use of mobile devices (mobile phones, smartphones, and devices that enable text-messaging for people with hearing impairment), payment methods, and interest in future services. Survey information was combined with data from the electronic medical record including demographic and historical self-report, DSM-IV diagnosis determined by agency clinical staff, and ongoing status (e.g. annual income, hospitalizations). After excluding 24 people due to missing data or endorsing mutually exclusive responses, researchers deidentified and analyzed the data with SPSS version 18.0. Frequency distributions were used to report on sample

demographics, ownership, patterns of use, payment methods, and interest in future services. Logistic regression analysis was conducted to examine whether having a mobile device is associated with age, income, and education.

Results

The final sample was comprised of 1,568 individuals with a mean age of 46 (SD = 12), 959 (61 %) were male; 872 (56 %) were African American and 648 (41 %) were Caucasian; 105 (7 %) identified as Hispanic; 1,136 (72 %) were single/never married; 1,077 (69 %) had a high school diploma or less years of education; 822 (52 %) lived independently; 573 (37 %) lived in supervised housing; 1,150 (73 %) earned $10,000 or less annually, 904 (58 %) were diagnosed with schizophrenia/schizoaffective disorder, 333 (22 %) with bipolar disorder, and 222 (14 %) with major depressive disorder; 430 (28 %) were also currently receiving treatment for a substance use disorder. Table 1 shows respondents' current use patterns, barriers among non-users, and preferences for future services.

Almost three quarters of respondents indicated that they currently possessed a mobile device. Mobile devices were more common among those with mood disorders (86 %) than those with a diagnosis of schizophrenia/schizoaffec-tive disorder (63 %). Of those who had a mobile device, 1,000 (64 %) reported having sufficient call or service minutes for at least 20 days of each month. Use was most frequently for talking, followed by texting, and internet activities. Most users reported daily use. Of those who did not have a mobile device, cost was the most common barrier. Less than a quarter of non-users indicated a lack of interest, and even fewer said they did not know how to use a mobile device (Table 1).

A logistic regression model showed that three variables significantly predicted whether participants had a mobile device. Participants with higher education levels were more likely to have one (B = 0.142, SE = 0.064); specifically, an increase in level of education (e.g. from high school graduate/GED to associates degree) was associated with a 15 % increase in the likelihood of having a mobile device. Younger participants were more likely to have one (B = −0.034, SE = 0.005); with each 1-year increase in age, the likelihood of having a mobile device dropped 3 %. Higher income was associated with having a mobile device (B = 0.288, SE = 0.104); each increase in level of annual income (e.g. from "$10,000 or less" to "$11,000–$20,000") corresponded with a 33 % increase in likelihood of having one.

Discussion

Seventy-two percent of people with SMI surveyed in this study owned a mobile device and used it regularly for a wide array of functions. We found that the rate of mobile device use among people with SMI was twice as high as was shown in earlier research (Borzekowski et al. 2009), and approximately 12 % lower than found in the general adult population in the U.S. around the time our study was conducted (Pew Research Center 2011). It is likely that mobile technologies are even more common among individuals with SMI who are less functionally impaired or have more resources than our sample of consumers of community mental health services. High rates in the current study may be due to the dramatic increase in mobile device use and infrastructure capacity world-wide (ITU 2011). Locally, the 2009

introduction of subsidy programs that provide mobile phones and call minutes to those eligible in Illinois may also account for higher rates in this sample. Consumers identified cost as a major barrier to mobile device ownership, suggesting that some either did not know about such programs or had difficulty accessing them. Given the pace of innovation in the mHealth arena, provider agencies must keep up with technology-related programs in their states, and assist consumers with linkage to resources.

At least 81 % of individuals with SMI who had a mobile device, and 62 % of those who did not, expressed an interest in receiving various mental health services via mobile technologies in the future. SMI are often persistent and pervasive in nature, and individuals with SMI often require ongoing care and support across many life domains. Mobile devices can help relay time-sensitive information and support during emergencies (e.g. acute symptom exacerbation, hospitalization, suicidal ideation), but they can also help providers maintain ongoing contact with consumers with SMI over prolonged periods of time (e.g. for delivery of automated reminders for appointments, regular check-ins, delivery of resources regarding supported employment efforts or housing needs) (Ben-Zeev et al. in press). Smartphone technologies are especially promising and may provide tools for self-monitoring, skills training, and engagement in interactive mobile mental health applications to facilitate self-management of illness (Luxton et al. 2011).

This study demonstrated that access, use, and interest in mobile technology among people with serious mental illness are already high and increasing rapidly, suggesting mobile devices may be viable conduits for future services. Researchers, mental health system administrators, and policy makers should partner in augmenting existing mobile technologies and designing novel mobile interventions.

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Table 1

Mobile device use and interest in future mobile services in people with SMI

	Mobile device users (*N*= 1,124, 72 % of total sample)	
Survey responses	***N***	**%**
Type of ownership		
Individual ownership	1,021	90.8
Other ownership arrangement (shared, rented, borrowed, other)	98	8.7
Payment plan		
Month-to-month	416	37.0
Government plan[a]	397	35.3
Contract plan	185	16.5
Prepaid card	162	14.4
Functions used		
Talk	1,030	91.6
Text	436	38.8
Internet/Email	373	33.2
Other	199	17.7
Frequency of use		
Daily use	724	64.4
Weekly use	272	24.2
Monthly use	49	4.4
Less than monthly use	74	6.6
Interest in mobile services		
Reminders about appointments or medications	469	42.0
Regular check-ins with provider	440	39.0
Information about mental health services	346	31.0
Preferred service delivery medium		
Calls	910	81.0
Text messages	355	32.0
Email	168	15.0

	Mobile device non-users (N = 444, 28 % of total sample)	
Survey responses	***N***	**%**
Barriers to ownership		
Affordability	182	41.0
Lack of interest	109	24.5
Lack of necessity	101	22.7
Can’t use phone	90	20.3
Other	83	18.7
Interest in mobile services		
Reminders about appointments or medications	137	30.9
Regular check-ins with provider	132	29.7

	Mobile device non-users (N = 444, 28 % of total sample)	
Survey responses	***N***	**%**
Information about mental health services	99	22.3
Preferred service delivery medium		
Calls	279	62.8
Text messages	128	28.8
Email	94	21.2

[a]The Federal Lifeline Program that helps qualified low income individuals pay for mobile phone service in the U.S.