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# Utilization of communication technology by patients enrolled in substance abuse treatment

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ABSTRACT

*Background:* Technology-based applications represent a promising method for providing efficacious, widely available interventions to substance abuse treatment patients. However, limited access to communication technology (i.e., mobile phones, computers, internet, and e-mail) could significantly impact the feasibility of these efforts, and little is known regarding technology utilization in substance abusing populations.
*Methods:* A survey was conducted to characterize utilization of communication technology in 266 urban, substance abuse treatment patients enrolled at eight drug-free, psychosocial or opioid-replacement therapy clinics.
*Results:* Survey participants averaged 41 years of age and 57% had a yearly household income of less than $15,000. The vast majority reported access to a mobile phone (91%), and to SMS text messaging (79%). Keeping a consistent mobile phone number and yearly mobile contract was higher for White participants, and also for those with higher education, and enrolled in drug-free, psychosocial treatment. Internet, e-mail, and computer use was much lower (39–45%), with younger age, higher education and income predicting greater use. No such differences existed for the use of mobile phones however.
*Conclusions:* Concern regarding the *digital divide* for marginalized populations appears to be disappearing with respect to mobile phones, but still exists for computer, internet, and e-mail access and use. Results suggest that mobile phone and texting applications may be feasibly applied for use in program–client interactions in substance abuse treatment. Careful consideration should be given to frequent phone number changes, access to technology, and motivation to engage with communication technology for treatment purposes.

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## 1. Introduction

Use of communication technology (i.e., computers, internet, e-mail and mobile phones) is ubiquitous in our society and accessibility is improving at a rapid pace. It is estimated that 88% of adults in the United States have a mobile phone, and 78% of adults use the internet (Zickuhr and Smith, 2012). Adolescent rates of communication technology use are also on the rise, with estimates of mobile phone and computer use being 75% and 93% respectively (Lenhart et al., 2010). Such high rates of technology use among the US population have provided a strong foundation and rationale for the integration of technology into research and health services delivery. Over-reliance on technology, however, threatens to aggravate health disparities among the socioeconomically disadvantaged, who may have limited access to communication technology resources.

The *digital divide* refers broadly to the unequal access to technology across various groups of the population. Communication technology encompasses mobile phones, computers, internet, and e-mail and access to each type of communication technology may have differential use in marginalized populations. Thus, the idea of the digital divide is a general concept regarding limited resources for certain individuals, but may be better conceptualized by the specific technology type being used. The digital divide has plagued healthcare by contributing to inequities in obtaining and utilizing health information (Kreps, 2005), as well as compromised access to social services (Steyaert and Gould, 2009). A recent report suggested that web-enabled applications may assist in addressing health disparities, and recommended tailoring technology-based

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interventions and education to underserved populations with limited health literacy (Gibbons et al., 2011). According to Lopez et al. (2011), people who are older, poor, belong to a racial or ethnic minority, or who are less educated are less likely to use the internet. Consistent with those results, Wang et al. (2011) found that internet use was lower among African Americans and Hispanics, as well as among those living in rural settings. Access to technology is only one obstacle though. A recent poll found that among adults who do not use the internet, the main reason is that they do not believe there is anything relevant to them on the internet (Zickuhr and Smith, 2012). These findings are particularly important in a substance abusing population with notoriously limited resources. Of patients entering substance abuse treatment in 2010, nearly 80% endorsed being unemployed or not being in the labor force (SAMHSA, 2012), indicating a generally low level of income that may presage low utilization of technology, especially computers and the internet. Computer and internet use represents only one source of technology contributing to the digital divide, and a thorough assessment of numerous communication technologies is needed to determine the extent of the digital divide in a substance abuse treatment population.

Despite concern regarding the digital divide, technology-based applications to improve healthcare delivery have advanced dramatically and represent a promising avenue for providing efficacious, widely available treatment that could greatly benefit those who might not otherwise contact services. One example is the relatively simple use of short-message service (SMS) text messages to remind patients of healthcare appointments. A recent Cochrane review showed higher rates of attendance at healthcare visits with SMS-text message reminders compared to no reminders and postal reminders (Car et al., 2012). While text message and phone call reminders appeared to result in similar attendance rates, costs associated with phone call reminders were shown to be higher. It is unclear, however, if certain sub-groups might be more receptive to text message reminders compared to phone calls (i.e., adolescents, night-shift workers).

Specifically within substance abuse treatment, a number of innovative, evidence-based, and efficacious applications have been developed. These interventions are based in already established psychosocial treatment and are currently being converted into an electronic format (i.e., mobile phones, computer, web-based), and also as supplements to treatment (see Moore et al., 2011; Marsch, 2012; Marsch and Dallery, 2012 for reviews). Technology-delivered treatments are meant to serve as an additional tool for counselors and service providers, as well as being continuously available for clients to access as needed. A recent meta-analysis showed the efficacy of computer-delivered interventions for alcohol and tobacco use with relatively minimal contact (Rooke et al., 2010), suggesting that computer-delivered interventions for more mild forms of substance use may be successful without formalized treatment.

The promise of technology integration into substance abuse treatment is appealing, however, there has been no comprehensive estimate of access to and familiarity with communication technology for those enrolled in substance abuse treatment, a factor that could significantly impact the feasibility of these efforts. Recent data have shown that mobile phone ownership and internet use among individuals making less than $30,000 per year is approximately 75% and 57% respectively, as compared to 95% use and ownership in individuals making more than $75,000 per year (Jansen, 2012), thus making it reasonable to expect high mobile phone usage in substance abusing populations enrolled in treatment, but low internet use. Even with high rates of mobile phone ownership, the use of *pay-as-you-go* phones that are frequently discarded when minutes expire may still impose a barrier on delivery of phone-based interventions.

The extent to which substance abusing populations use computer and internet technology is also largely unknown. Rates of internet access in patients enrolled in substance abuse treatment reported as part of larger interventions have varied greatly, ranging from 20% (King et al., 2009) to approximately 71.6% (VanDeMark et al., 2010). Results from a recent study utilizing focus groups comprised of substance abuse treatment patients ($N = 11$) showed that participants reported having more online access and knowledge than clinic treatment staff expected (Wolf-Branigin, 2009). These studies, while providing useful preliminary estimates of communication technology use, do not provide a comprehensive data set to accurately characterize communication technology use among patients enrolled in substance abuse treatment. Such a data set would serve to improve treatment interventions, supplements, participant contact and retention, and other service delivery provided through technological means. Therefore, we conducted a survey study across eight urban, psychosocial or opioid-replacement clinics with the purposes of characterizing utilization of communication technology (i.e., mobile phones, computers, internet, and e-mail), and exploring facets of technology use that may serve as barriers to their utility for treatment in this population.

## 2. Methods

Participants ($N = 266$) were recruited from eight study sites located in the Baltimore city metropolitan area. These sites were either affiliated with the Johns Hopkins University School of Medicine or were community treatment programs that included four outpatient clinics providing both psychosocial services and opioid replacement therapy ($N = 144$), two outpatient methadone and buprenorphine maintenance programs ($N = 87$), one primary care clinic providing buprenorphine maintenance for substance abuse disorders ($N = 6$), and one outpatient clinic providing only psychosocial services ($N = 29$). Participants were recruited through posted fliers in clinic areas, word of mouth, and clinic staff. The only criterion for participation was age older than 18 years and currently enrolled in substance abuse treatment. All study procedures were approved by the Johns Hopkins School of Medicine Institutional Review Board.

The survey included 12 locally-developed questions about use of communication technology, which were embedded within a 133-item survey that asked about various topics including: tobacco use and dependence, employment status, smoking attitudes, knowledge, and cessation services provided at the treatment clinic and demographic information. The items not related to technology will not be discussed in the current report. Questionnaires were self-administered via paper and pencil surveys ($N = 191$) or via computer ($N = 75$). Choice of preferred questionnaire method (computer or paper) was not always available (i.e., clinics did not have wireless, laptops were already being used, etc.), and was not included in any analyses. Individuals who were unable to read the questions were administered the survey by research staff. All participants were given either $5 or a small prize for survey completion.

Communication technology questions were: (1) regular (weekly) use of a mobile phone (Y/N), (2) ownership of the phone (Y/N), (3) contract type (*pay-as-you-go*/yearly), (4) frequency of changing phone numbers in the past year (never, 1 time, 2 times, 3 times, 3+ times), (5) SMS text message usage (sending and receiving) (Y/N), (6) text message limits (Y/N; if yes, how many), (7) call limits (Y/N; if yes, how many calls per day), (8) does clinic staff ever call or text (call, text, call and text, neither), (9) regular (weekly) use of computers (Y/N), (10) location of computer (house, work, library, friend, family, other), (11) regular (weekly) use of the internet (Y/N) and (12) regular (weekly) use of e-mail (Y/N).

All data were analyzed using SPSS version 19. *T*-Tests and Chi Squares were performed to examine relationships between technology characteristics across various demographic variables. Based on meaningful predictors of technology outcomes ($p < .10$), binary logistic regression analyses were run to control for inter-related predictors. All technology variables were binary, and most demographic and substance abuse predictors were also binary, with the exception of age (continuous), and education (less than HS, HS/GED, Some college or greater). Beta values ($\beta$) and standard error (SE) are presented from these analyses. Logistic regression analyses were exploratory and since groups did not consistently have equal distribution across technology outcomes, power was occasionally low for logistic models.

## 3. Results

### 3.1. Participants

Demographic information for survey participants is shown in Table 1. The mean (SD) age of the sample was 44.1 (11.5), 64%

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