CARNEVALE ASSOCIATES LLC

INFO BRIEF

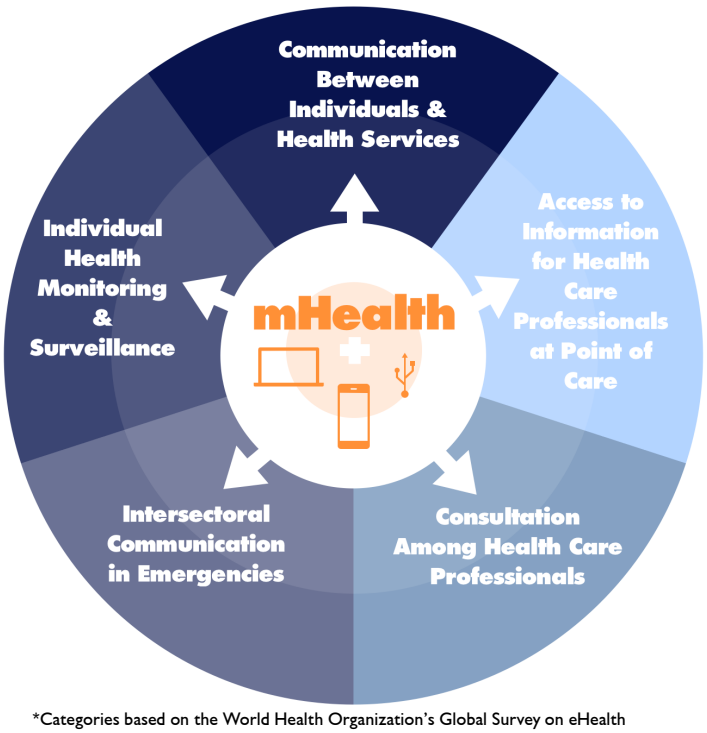
Mobile Health Interventions for Substance Use Disorder

Technology has rapidly revolutionized health care systems, including within behavioral health. Innovative capabilities, such as web-based interventions and smartphone applications (apps), have widespread implications for public health – particularly for the treatment of substance use disorders (SUDs) using evidence-based modalities. This information brief explains the mobile health landscape for SUD treatment, examining benefits & limitations and highlighting the need for further research.

WHAT IS MOBILE HEALTH?

Mobile health, or mHealth, allows mobile access to health information or services through a personal device (e.g., smart phone, tablet, or laptop). According to the World Health Organization, while broad in scope, mHealth generally aims to address the following domains: communication between individuals and health services, consultation among health care professionals, intersectoral communication in emergencies, individual health monitoring and surveillance, and access to information for health care professionals at point of care (See Figure 1).[1] MHealth in the context of SUD treatment can take many forms.

FIGURE 1. FUNCTIONS OF mHEALTH*



*Categories based on the World Health Organization's Global Survey on eHealth

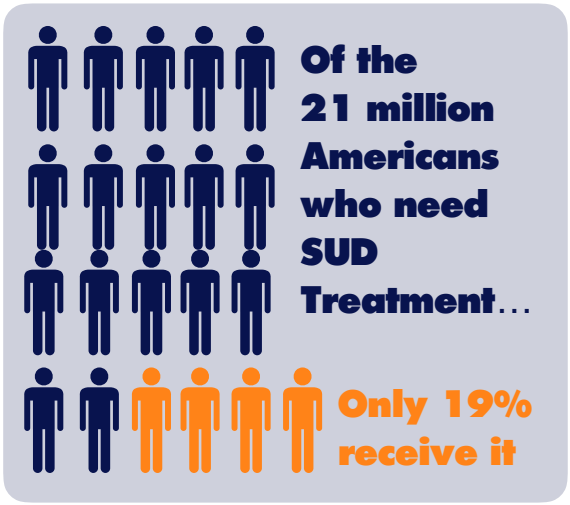
Most prominently, apps used in outpatient settings are prescribed to individuals with SUD and deliver self-paced, mobile therapeutic modules. App users can self-report risk behaviors and substance use in real time, administer knowledge checks to reinforce therapeutic lessons, and access information on local community resources like self-help groups. In some applications, clinicians receive client-entered data and use it to inform treatment decisions.

Regulation by the US Food and Drug Administration (FDA) is challenging for products that claim improvements around behavioral health outcomes (e.g., impulse control, coping mechanisms, and peer influence).[2] The FDA has some authority over mHealth interventions, as "medical devices." However, the degree to which the FDA can regulate mHealth interventions depends on the extent to which their technology meets the definition of a "medical device" as outlined in a 2019 policy guidance document. FDA guidance dictates discretion in enforcement across a number of software functions within the scope of mHealth for SUD treatment, contributing to an ambiguous regulatory environment.[3]

HOW mHEALTH CAN BENEFIT SUD TREATMENT

The proliferation of mobile devices presents opportunities for SUD-focused mHealth: through improvements in access, data reliability, and treatment fidelity. Mobile health interventions offer access to hard-to-reach populations, such as those living in rural areas where there may be few local treatment options.[4] In 2018, an estimated 21 million Americans 12 or older needed substance use treatment, with only approximately 4 million (19%) receiving treatment in the past year (See Figure 2).[5] The high prevalence of cell phone access and usage, particularly among youth, may offer an opportunity to address this disparity. In 2018, 81% of Americans owned a smartphone and about three-quarters of adults owned either a laptop or desktop.[6] The present gap between those needing and those receiving SUD treatment might be addressed through mHealth. Mobile health applications also allow users to self-report behaviors in real time, which improves accuracy relative to recall at traditional treatment appointments.[7] Additionally, mHealth may help patients avoid stigma associated with SUD treatment,

FIGURE 2. THE NEED FOR SUD TREATMENT SERVICES



thereby encouraging utilization. Finally, mHealth may offer better standardization of care when compared to in-person treatment.[8]

COST SAVINGS & mHEALTH APPLICATIONS IN SUD TREATMENT

Substance abuse costs the US an estimated $600 billion annually.[9] The annual economic cost of prescription opioid misuse alone is almost $80 billion, with about $30 billion attributed to heath care and treatment.[10] Limited research has been conducted on the relative cost of technology based behavioral health interventions compared to traditional in-person treatment, but some studies have shown that mHealth may be cost-effective. Still, more rigorous cost-analyses are needed.[11] Mobile Health can generate savings through reduced clinician hours, but there are also unique costs associated with mHealth applications, particularly in the initial start-up phase, to be assumed either by patients or providers/payers. These can include the cost of mobile devices, internet connectivity, technical support, software updates, and training.[12]

EVIDENCE OF EFFECTIVENESS

Though still an emerging area in behavioral health, existing evidence suggests that mHealth interventions may be effective tools in the treatment of SUDs. To date, the only FDA approved mobile app for SUD treatment is reSET (for SUD, generally) and reSET-O (for opioid use disorder), with studies demonstrating positive effects on treatment retention and total abstinence days.[13] Used in outpatient settings, individuals with SUD download reSET with a prescription code – getting 12-weeks of digital cognitive behavioral therapy modules; a feature to record cravings, triggers, and use in real-time; and incentives for completing lessons. Patient data flows to a clinician-facing dashboard to inform in-person sessions. Another well-researched app-based intervention targeting alcohol use showed similarly positive results with individuals receiving the A-CHESS[14] intervention, demonstrating greater treatment retention and reporting fewer heavy drinking days compared to those in standard treatment.[15]

Meta-analyses of randomized trials examining web-based interventions for alcohol and cannabis misuse have also shown promising results with small but significant overall effect sizes; however, the wide scope of delivery settings and intervention approaches hinder generalizability.[16] Similarly, a systematic review of 26 studies of substance use prevention and treatment interventions among youth found that those studies with the highest quality demonstrated reductions in substance use.[17] Taken together, these results demonstrate mHealth's promise, but more robust research is needed. Studies with longer follow-up periods and which address relapse prevention after treatment discontinuation could support more universal adoption of these interventions. The diversity of delivery settings and approaches also poses significant challenges to measuring mHealth effectiveness.

LIMITATIONS OF mHEALTH APPLICATIONS FOR SUD TREATMENT

Despite its promise, mHealth has several limitations. First, web- and app-based interventions are not meant to serve as a substitute for treatment with a clinician but rather as "clinician-extenders" in conjunction with medication or traditional in-person treatment. Assessing the authenticity of information entered into an app, the degree of client engagement, and program adherence would also be difficult without an in-person component.[18] Second, accessibility presents challenges, including language barriers for non-English speakers, availability of broadband internet, access to adequate personal devices, and client comfort with technology.[19] Third, privacy concerns may deter client adoption. Clients may be hesitant to enter sensitive information on a digital platform or resist app-based tracking, as some apps may have GPS capability (e.g., to monitor proximity to high-risk areas).[20] Fourth, the use of evidence-based modalities is variable. A systematic search of smartphone apps targeting alcohol and substance use found 74

commercially available apps, yet few integrated evidence-based interventions.[21] Lastly, as with any technology, rapid technological changes may shorten the shelf-life of an app whose features may become quickly obsolete – posing a risk that significant resources are sunk into an app that is not widely adopted.

CONCLUSION

Mobile health interventions have potential to address gaps in care for individuals with SUD, but more research is needed before implementing them across all health care settings. In particular, longer follow-up periods post-treatment and more rigorous cost analyses would contribute to the current literature. The effectiveness of mobile health interventions is difficult to generalize, given their high variability. When paired with an ambiguous regulatory environment and wide variety of products, this places a greater burden on consumers and providers to assess the evidence for any given intervention before adoption.

NOTES:

[1] World Health Organization. (2011). mHealth: New Horizons for Health Through Mobile Technologies. Retrieved February 18, 2020 from https://www.who.int/goe/publications/goe_mhealth_web.pdf

[2] Tofighi, B. et al. (2018). The Role of Technology-Based Interventions for Substance Use Disorders In Primary Care: A Review of the Literature. Medical Clinics of North America, 102(4), 715-731.

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[14] The Addiction Comprehensive Health Enhancement Support System

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[21] Ref 9