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Mobile technology-based interventions for adult users of alcohol: A systematic review of the literature

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HIGHLIGHTS

- This review summarizes the current literature on mobile technology-based interventions among adult users of alcohol.
- Five relevant databases were searched for peer-reviewed articles from 2004 to 2015. Eight studies met inclusion criteria.
- The majority found positive effects of the intervention, although the interventions were primarily preliminary in nature.
- Findings highlight the promising, yet preliminary state of research in this area.
- M-tech interventions have the potential to compliment established treatment modalities for alcohol use among adults.

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ABSTRACT

Background: Worldwide, 16% of people aged 15 and older engage in harmful use of alcohol. Harmful alcohol use leads to a host of preventable negative social and health consequences. Mobile technology-based interventions provide a particularly promising avenue for the widespread and cost-effective delivery of treatment that is accessible, affordable, individualized, and destigmatized to both alcohol-dependent and nondependent individuals.
Aims: The present review sought to summarize the current literature on mobile technology-based interventions among adult users of alcohol and determine the efficacy of such interventions.
Methods: Five databases were searched in December 2015 (Jan. 2004–Dec. 2015). Inclusion criteria were: participants aged 18 or older, interventions delivered through mobile-technology, and outcome measurement of alcohol reduction/cessation.
Findings: Eight studies met inclusion criteria. The majority of the studies reviewed found positive effects of the intervention, even though the interventions themselves varied in design, length, dosage, and target population, and were pilot or preliminary in nature.
Conclusions: Findings from this review highlight the promising, yet preliminary state of research in this area. Studies with adequate power and valid design are necessary to evaluate the potential of mobile technology-based interventions on long-term alcohol behavior outcomes. Furthermore, future research should elucidate what the most effective length of time is for a mobile technology-based intervention, how often individuals should receive messages for maximum benefit, and determine the comparative effectiveness of mobile technology interventions with other efficacious interventions.

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1. Introduction

Misuse and abuse of alcohol remains a serious public health concern. Misuse of alcohol is the leading risk factor for premature death and disability among people between the ages of 15 and 49 (Lim et al., 2012); nearly a quarter of all deaths among those aged 20 to 39 are attributable to alcohol (World Health Organization [WHO], 2014a). Worldwide, 16% of drinkers aged 15 years or older engage in harmful alcohol use (WHO, 2014b). Harmful drinking—drinking that causes damage to physical and/or mental health—is associated with short-term risks such as injuries (e.g., motor vehicle crashes, drownings, and burns), violence (e.g., homicide, suicide, and sexual assault) and risky sexual behaviors (e.g., unprotected sex and multiple sex partners) as well as long-term risks such as mental health problems (e.g., depression and anxiety), poor school performance, poor productivity and unemployment, family problems, and alcohol dependence or alcoholism (Centers for Disease Control and Prevention [CDC], 2014). Currently, only 15–25% of individuals with drinking problems seek treatment (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2014). There is an urgent need for effective interventions that reduce or eliminate treatment barriers.

1.1. Traditional treatments

Brief interventions (e.g. one-time brief interventions) and motivational enhancements (e.g. in-person motivational interviewing, psychoeducational therapy) have been identified as two highly effective forms of alcohol abuse treatment (Hester & Miller, 2002). For example, a meta-analysis of 31 alcohol-related studies using motivational interviewing found a combined effect size (across measures and time points) of 0.22 (95% CI: 0.10, 0.34) for blood alcohol concentration and 0.08 (95% CI: −0.02. 0.19) for alcohol-related problems (Hettema, Steele, & Miller, 2005), indicating that motivational interviewing can reduce alcohol consumption and alcohol-related consequences. Furthermore, alcohol screenings and brief interventions have been shown to be effective among non-treatment seeking populations and across a variety of settings (Moyer, Finney, Swearingen, & Vergun, 2002). In fact, a recent review of systematic reviews found moderate effects of brief interventions among non-dependent alcohol users (Álvarez-Bueno, Rodríguez-Martín, García-Ortiz, Gómez-Marcos, & Martínez-Vizcaíno, 2015). Cognitive-behavioral therapies are also highly effective at treating problem drinking (Nauert, 2012). Overall, both cognitive and behavioral changes following these traditional alcohol treatments (i.e., brief interventions, motivational enhancements, and cognitive behavioral therapies) have been widely documented in the literature (Samson & Tanner-Smith, 2015; Scott-Sheldon, Carey, Elliott, Garey, & Carey, 2014; Scott-Sheldon, Demartini, Carey, & Carey, 2009; Tanner-Smith & Lipsey, 2015), and, importantly, the literature indicates that individuals accept these treatment modalities (Hungerford, Pollock, & Todd, 2000).

Despite the effectiveness and acceptance of these interventions, substantial barriers exist in the implementation of and access to traditional person-delivered interventions. These interventions are resource intensive, depend a great deal on the skill of the clinician (i.e., fidelity to the intervention technique), cannot be simultaneously tailored to a large number of individuals, lack widespread accessibility, and are potentially stigmatizing. Barriers such as accessibility and stigma may help explain low rates of treatment-seeking behaviors among problem drinkers.

Traditional interventions require substantial time and money as well as trained providers. For instance, cognitive-behavioral therapies typically involve between 10 and 20 sessions (Mayo Clinic, 2015) delivered by a therapist with a doctorate or master's degree in a mental health, medical, or related field (Beck Institute for Cognitive Behavior Therapy, n.d.). Furthermore, motivational enhancements involve four carefully tailored treatment sessions that each last approximately 1 h (Miller, Zweben, DiClemente, & Rychtarik, 1992; Miller, 2000). Existing research has shown that tailored interventions are more effective than group and/or untailored interventions (Ryan & Lauver, 2002), particularly at promoting positive health behaviors such as quitting smoking (Copeland, Martin, Geiselman, Rash, & Kendzor, 2006), reducing alcohol intake (Suffoletto et al., 2015), getting vaccinated (Gowda, Schaffer, Kopec, Markel, & Dempsey, 2013), being screened for breast cancer (Ishikawa et al., 2012), and taking multivitamins (Milan & White, 2010). A limitation of traditional behavioral therapies is that these interventions, while effective for both individuals and groups, can be quite resource intensive for group treatments (Center for Substance Abuse Treatment, 1999; Velasquez, Crouch, Stephens, & DiClemente, 2015). Due to their resource intensity, traditional behavioral interventions cannot be easily and simultaneously tailored to large numbers of individuals. Furthermore, traditional behavioral therapies depend a great deal on the skill of the clinician/therapist. Therapeutic style forms the core of motivational enhancement therapy (MET) and the therapist characteristic of "accurate empathy" has been shown to be a powerful predictor of therapeutic success with problem drinkers (Miller et al., 1992; Miller, 2000). Brief interventions require clinicians to possess specific knowledge, skills, and abilities in order to be effective (Barry, 1999; U.S. Department of Health & Human Services, 2005). Most importantly, the low rates of treatment-seeking behavior may be explained by a lack of access to care and/or a failure to seek what is often stigmatized treatment (Cunningham, Kypri, & McCambridge, 2011). For instance, in the United States and Canada, adequate access to cognitive-behavioral therapy remains a major barrier to improving clinical outcomes (Payne &