



Randomized controlled pilot trial of supportive text messaging for alcohol use disorder patients



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ABSTRACT

Aims: To evaluate the effectiveness of an addiction-related supportive text messaging mobile intervention to improve treatment outcomes for patients with alcohol use disorder (AUD).

Methods: A single-rater-blinded randomized trial was conducted involving 59 AUD patients who completed a residential addiction treatment program. Patients in the intervention group (n = 29) received supportive text messages for three months following discharge. Patients in the control group (n = 30) received a text message thanking them for participating in the study. The primary outcome of this study was the three months Cumulative Abstinence Duration (CAD); secondary outcomes (units of alcohol per drinking day, numbers of days to first drink) and exploratory outcomes (health utilization) were evaluated. Subgroup analyses were also done. The enrollment rate in the study was 84%, and of those who enrolled, 73% were retained.

Results: When primary and secondary outcome measures were examined via effect size analysis, the number of days to first drink was longer in the intervention than control group (large effect size, although not statistically significant). The intervention group's mean first day to drink was over twice the length of the control group (e.g., approximately 60 vs. 26 days, respectively, with a mean difference of 34.97 and 95% CI of -5.87–75.81). Small to moderate effects were found for CAD and units of alcohol per drinking day. Small to negligible effects were found for health utilization. On subgroup analyses, the participants who received text messages, among those who did not attend follow-up outpatient counselling, showed a longer CAD.

Conclusions: The results suggest text messaging is a feasible and effective opportunity for follow-up care in patients discharged from residential AUD treatment.

1. Introduction

Alcohol use disorder (AUD) is characterized by its chronic, recurrent nature and associated behavioural, cognitive, physiological, and social problems (American Psychiatric Association & American Psychiatric Association, 2013). In 2015, the estimated prevalence (in the past 30 days) among the adult population was 18.4% for heavy episodic alcohol use and the age-standardized prevalence of alcohol dependence was 843.2 per 100,000 people (Peacock et al., 2018). AUD is one of the most damaging, costly, and common diseases globally. According to estimates provided by the World Health Organization (WHO | Global Status Report on Alcohol and Health 2014), alcohol abuse accounts for

nearly 6% of all deaths and 5% of the global burden of disease, and is implicated in over 200 adverse health conditions. Recent Canadian alcohol consumption was estimated at 10 l per year of pure alcohol per capita for people > 15 years of age (WHO Global Information System on Alcohol and Health 2017). The total cost of AUD is staggering, particularly when considering its multiple downstream societal costs (Nutt, King, & Phillips, 2010). In Canada alone, the annual estimated cost of alcohol abuse was \$14.6 billion in 2002 (Publications | Canadian Centre on Substance Use and Addiction n.d.), with AUD prevalence rates in Canada estimated at nearly 3% in 2003 (Tjepkema, 2004). A more recent population level study put the prevalence rate for problematic alcohol and/or illicit drug use in Canada at 4.6% (Dumais et al.,

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2013). In addition to economic burden, AUD leads to chronic human suffering. Patients face high relapse rates and limited treatment options (Moos & Moos, 2006; Walitzer & Dearing, 2006). Additionally, patients with AUD have high psychiatric co-morbidity, including mood and anxiety disorders and are more likely to utilize acute and emergency health services (Dumais et al., 2013). Furthermore, evidence suggests AUD implicates multiple generations, with a reported 40% to 60% heritability (Agrawal et al., 2008).

In light of the considerable societal burden of AUD and its recognition as a major public health problem that is associated with high relapse rates (Miller, Walters, & Bennett, 2001; Moos & Moos, 2006), innovative care options, such as use of novel technologies, is required. This is particularly true in remote and rural areas, such as Northern Alberta, where this study was conducted. In a literature review of eight studies on mobile technology-based interventions among adult users of alcohol undertaken to determine the efficacy of such interventions, the majority of studies found positive intervention effects, even though the interventions themselves varied in design, length, dosage, and target population, and were pilot or preliminary in nature (Fowler, Holt, & Joshi, 2016). Text messaging technology has been successfully implemented in reducing substance abuse (Tofighi, Nicholson, McNeely, Muench, & Lee, 2017), including programs aimed at cessation of tobacco smoking (Keoleian, Polcin, & Galloway, 2015) and with college-age students as a means of reducing risky drinking (Rourke, Humphris, & Baldacchino, 2016).

Maintenance of therapeutic contact following an intensive addiction treatment program through both traditional or mobile health technology appears to promote recovery and improve long-term clinical outcomes (Gustafson, McTavish, Chih, et al., 2014; McKay, 2005). In this respect, text messaging technology offers considerable potential as a way to provide continuous care for patients discharged from inpatient AUD treatment programs that may not otherwise be feasible due to resource and accessibility constraints. Supportive text messaging is a relatively low cost, high impact, and easily scalable program that uses existing technology, is devoid of geographic barriers, and is free and accessible to end users (Agyapong, Farren, & McLoughlin, 2011).

Preliminary research using an interactive text-based help line with patients discharged from an inpatient substance treatment program suggested adequate rates of patient adherence and a statistical trend towards reduced consumption of alcohol compared to a treatment as usual group (Lucht et al., 2014). Likewise, patients with comorbid AUD and major depressive disorder who completed an inpatient treatment program responded positively to a supportive text messaging intervention (Agyapong, Ahern, McLoughlin, & Farren, 2012). In addition to symptom improvement, high patient satisfaction rates in patients with comorbid AUD and depression have been reported, with 75% of patients reporting text messages reminded them to abstain from alcohol, and 83% endorsing the messages as motivating recovery and preventing relapse (Agyapong, Milnes, McLoughlin, & Farren, 2013). An exploratory, single-blind randomized controlled pilot study comparing four different types of alcohol reduction-themed text messages sent daily to weekly drink self-tracking texts sought to determine their impact on drinking outcomes over a 12-week period. The study found that almost 80% of study participants wanted to continue receiving messages for an additional 12 weeks at the end of the study (Muench et al., 2017), suggesting high acceptability and feasibility of text messaging interventions for AUD. Other positive outcomes related to medication adherence, engagement with peer support groups appointment attendance, motivation, self-efficacy, relapse prevention and social support were documented in a recent systematic review of mobile phone messaging interventions for illicit drug and alcohol dependence (Tofighi et al., 2017). These findings reinforce the feasibility and acceptability of using text-message interventions to support patients with AUD. Existing studies provide preliminary support for the feasibility, acceptability, and effectiveness of text messaging following inpatient treatment for AUD. The objective of this study was to test the initial efficacy of using

an AUD-focused, supportive text messaging mobile health intervention in supporting the continuing care and recovery of patients with AUD discharged from residential treatment. Whilst there are several studies using text messages in AUD patients, this pilot study is the first of its kind in the North American context to utilize twice daily automated supportive text messages for three months in patients with AUD and incorporates a range of outcome measures at three-month follow-up. These include Cumulative Abstinence Duration (CAD; primary outcome), mean number of days to first drink and mean units of alcohol per drinking day (secondary outcomes), and health service utilization (e.g., number of visits to family physicians, psychiatrists, and other specialist physicians, Emergency Department visits, addiction counselling sessions attended; exploratory outcomes). Given the focus on identification of factors that predict participation in continuous care following residential treatment for substance use in the last decade (Arbour, Hambley, & Ho, 2011), subgroup analyses was also done to evaluate whether specific demographic and clinical factors are associated with longer CAD following use of text messages. We hypothesized that patients who received twice daily supportive text messages would have a higher Cumulative Abstinence Duration, higher days to first drink and lower units of alcohol per drinking day compared to the control group. We also hypothesized that patients receiving twice daily supportive text messages would achieve higher mean scores in respect of attendance at scheduled clinical appointments (such as with family doctors, specialists and counsellors) and achieve lower mean scores with respect to the number of emergency health services and acute care services utilized compared to patients in the control group.

2. Methods

2.1. Study design and participants

This study was a single-rater blinded randomized trial of daily addiction-related supportive text messages delivered to participants' mobile phones. Participants were recruited from patients completing the 28-day addiction treatment program at the Northern Addiction Rehabilitation Centre in Grande Prairie, Alberta, Canada, from June 2015 to December 2015. The residential addiction treatment program consists of one-to-one, group, and family counselling, interactive workshops, information sessions, recreation and leisure programming, nutrition assessment and support, self-help and relapse prevention groups, discharge planning and after program support. The individual and group programs are run by addiction counsellors and social workers and patients have access to psychiatric consultation. Written and oral informed consent was obtained from each participant. The study protocol was approved by the Research Ethics Board of the University of Alberta and published (Agyapong et al., 2015). The study was conducted in accordance with the Declaration of Helsinki (World Medical Association, 2013) and WHO Good Clinical Practice Guidelines (Guidelines for Good Clinical Practice (GCP) for Trials on Pharmaceutical Products. WHO Technical Report Series, No. 850, Annex 3 - WHO Expert Committee on Selection and Use of Essential Medicines, Sixth Report, 1993 n.d.). The trial was registered with clinicaltrials.gov (NCT02327858). CONSORT criteria were used for reporting study findings (Schulz et al., 2010).

Study participants met the following inclusion criteria:

1. Age 18 years and above and capable of providing informed consent.
2. Completing the final week of admission at the 28-day residential addiction treatment program at the Northern Addiction Treatment Centre in Grande Prairie, Alberta, and fulfilled the DSM-5 diagnostic criteria for Alcohol Use Disorder (American Psychiatric Association & American Psychiatric Association, 2013). Diagnosis was determined following a structured clinical interview by a licensed addiction counsellor to elicit the presence or absence of specific diagnostic criteria, as outlined in the DSM-5.

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