A pilot trial of text-delivered peer network counseling to treat young adults with cannabis use disorder

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ABSTRACT

Approximately 1.8 million young adults aged 18 to 25 had a Cannabis Use Disorder (CUD) in the past year. Unfortunately, engaging young adults in treatment is very challenging. Creative approaches to treat cannabis disorders such as integrating mobile technology with evidence-based treatments are warranted. In light of these challenges, we developed a text message-delivered version of Peer Network Counseling (PNC-txt), which is a substance use intervention that focuses on peer relations. PNC-txt engages participants in 16 automated, personalized text interactions over 4 weeks. We conducted a randomized controlled trial to test the efficacy of PNC-txt against a waitlist control group with 30 treatment seeking young adults (ages 18–25) who met DSM-5 criteria for CUD. Self-report and urine analyses were used to test outcomes at the three-month follow-up. The PNC-txt group significantly reduced their cannabis use related problems as well as cannabis cravings, compared to the control group. PNC-txt participants also had a significantly greater percentage with urines negative for cannabis metabolites compared to controls. Moderation analysis showed that CUD severity level moderated treatment, suggesting that PNC-txt is more effective for participants with medium and high levels of CUD severity. All effect sizes ranged from medium to large. Results from this pilot trial are promising and warrant further research on PNC-txt for addressing cannabis use disorder.

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1. Introduction

Young adulthood is a particularly critical developmental period with rates of substance use more than doubling between early adolescence and young adulthood (Johnston et al., 2018). Recent data from the Monitoring the Future (MTF) survey indicate that more than a third (35.3%) of young adults ages 19 to 28 report cannabis use in the past year – the highest levels recorded in three decades (Schulenberg et al., 2017). Even more concerning, approximately one in thirteen young adults (7.6%) are now daily cannabis users (using 20 or more times per month) – the highest levels ever recorded since the inception of MTF (Schulenberg et al., 2017). Over 5% or approximately 1.8 million young adults aged 18 to 25, had a Cannabis Use Disorder (CUD) in the past year (SAMHSA, 2016). Unfortunately, young adults rarely seek help or recognize a need for substance use treatment (Caldeira et al., 2009). Among college students cannabis use is associated with poorer academic performance (Arria, Caldeira, Bugbee, Vincent, & O'Grady, 2015; Suerken et al., 2016) and discontinuous enrollment/drop-out (Arria et al.,

2013). Cannabis use has been associated with both traffic and non-traffic injuries (Barrio et al., 2012; Li et al., 2012). Frequent and sustained cannabis use has also been prospectively associated with functional impairment due to injury, illness, and emotional problems, lower health-related quality of life, and greater psychiatric symptoms (Caldeira, O'Grady, Vincent, & Arria, 2012).

Cannabis use varies by current educational status for young adults. Past 30-day cannabis use among young adults who are enrolled fulltime in college and their non-college enrolled peers in 2016 was 22% and 30% respectively. Non-college enrolled young adults are using cannabis daily at a rate more than twice (12.8%) that of their college-enrolled peers (4.9%) (Schulenberg et al., 2017). Both of these young adult populations should be studied as both have unique challenges and perceived barriers to treatment engagement (SAMHSA, 2015).

1.1. Barriers to treating cannabis use disorders in young adults

Effectively addressing Cannabis Use Disorders is challenging. The cost of treatment, difficulty in accessing treatment facilities, and stigma associated with seeking help, prevent many young adults from engaging in treatment (Perron et al., 2009). Stigmatization by peers may prevent treatment engagement for young adults, as they are particularly

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sensitive to peer perceptions surrounding this issue. In a national study, 37% of college students feared social stigma attached to substance abuse, which kept them from seeking help; only 6% of students who met criteria for alcohol or drug disorder sought help (CASA, 2007). Finally, dependent upon the cannabis use culture where young adults finds themselves, acknowledging that their use of cannabis has contributed to significant social, educational or career, and emotional problems is often difficult, and many do not recognize a need for treatment (Caldeira et al., 2009). This type of self-awareness is a critical step towards seeking treatment and is often accompanied with a sustained pattern of negative events such as a disturbed social relations or doing poorly in school or work. This critical decision point is common among those who struggle with substances of abuse, where the individual has to see enough down-side of their behavior to instigate treatment seeking. Thus, intervention modalities that can deliver treatments while minimizing the associated barriers are vital to engaging more young adults in substance use treatment. Technology-based programs have been identified as a useful tool in engaging young adults, particularly those not enrolled in college who may be difficult to find (SAMHSA, 2015).

1.2. Integrating text messages into CUD treatment

Compared to other age groups, young adults ages 18 to 24 are the most active in their use of text messaging, sending and receiving 128 texts per day and 3853 per month (Burke, 2016). A small but growing literature has integrated text-based interventions into substance use treatment. Most of these studies have targeted tobacco and alcohol use. The content, frequency and duration of these interventions have been wide ranging, and many studies have not reported sufficient detail to fully understand or replicate findings. In a meta-analysis of text-delivered alcohol and tobacco programs for adolescents and young adults, interventions ranged from a single text message reflecting the amount of money spent on alcohol to more complicated designs based on cognitive behavioral theory and motivation frameworks with texts sent over several weeks to many months (Mason, Ola, Zaharakis, & Zhang, 2015). Yet, the limited evidence available so far is promising. For example, Gonzales, Hernandez, Murphy, and Ang (2016) found that young adults in treatment for a drug use disorder who were randomized to a mobile texting aftercare intervention fared better than the usual-care control group. To date, we are aware of only one study that has tested a text message-based intervention specifically for cannabis use among young adults (Shrier, Rhoads, Burke, Walls, & Blood, 2014); however, this intervention was not tested as a free-standing intervention but rather as a supplement to two in-person counseling sessions. The intervention used a motivational interviewing approach and was tailored using baseline assessments. For two weeks post- counseling sessions, participants were sent supportive texts if they reported use, desire to use, or being in the presence of a trigger during randomly sent ecological momentary assessments (Shrier et al., 2014). Participants also received a text message after completing daily diary surveys.

Text-based interventions can circumvent several barriers to treatment, including stigma, cost, and access, and there is evidence that they are an acceptable mode of treatment among young adults (e.g., Gonzales et al., 2016). While research on text-message interventions is still in the early stages, results thus far provide initial evidence of effect sizes, most often within the small range (Mason, Ola, et al., 2015). However, given the ability of text message interventions to circumvent treatment barriers and reach large populations more easily than traditional in-person interventions, smaller effect sizes may still be useful in impacting treatment outcomes with greater numbers of patients. Advances in technology now allow for the easy personalization of text messages, thereby offering the opportunity to provide tailored text-based interventions. Given these results and the limited number of rigorous trials in the extant literature, developing text-based interventions for CUD appears to be justified.

1.3. Peer context as target in young adult treatment

Extensive research has shown that peer context is a very robust predictor of cannabis use (Pollard, Tucker, de la Haye, Green, & Kennedy, 2014). For example, a recent study demonstrated that when actual friends' cannabis use increased, personal cannabis increased (Deutsch, Chernyavskiy, Steinley, & Slutske, 2015). In contrast, research has found that peer prosocial behaviors stimulate or activate internal motivation of index participants as well as through "conformity training" where peers approve of each other's prosocial behaviors and disapprove of antisocial behaviors (Exner-Cortens, 2014; Mrug & McCray, 2013). Peers provide an important route for exposure to cannabis, with almost 80% of 18 to 22 year olds reporting that they have at least one friend who uses cannabis (Schulenberg et al., 2017). Addressing the peer context as a clinical target for reducing cannabis use among young adults has a scientific premise.

1.3.1. Peer network counseling rationale and structure

Given the above review, interventions that target the importance of peer context with young adults and utilize text messaging would be a promising approach for substance use disorder treatment. One such intervention is Peer Network Counseling (PNC). PNC is a brief (20 min) substance use in-person intervention that uniquely focuses on peer relations as the primary mechanism for behavioral change. PNC has been tested in five clinical trials with over 400 adolescents and young adults (Mason, Pate, Drapkin, & Sozinho, 2011; Mason, Benotsch, Way, Kim, & Snipes, 2014; Mason, Light, et al., 2015; Mason, Mennis, et al., 2016; Mason, Sabo, & Zaharakis, 2016). PNC is a peer-focused substance use intervention that applies Motivational Interviewing (MI) (Miller & Rollnick, 2013) principles, but uses a relational framework in addressing risk behaviors, focusing on the interpersonal and environmental interactions that the participant encounters. PNC introduces the construct "peer network health" (a summative index of participants' peers' prosocial and risk-enhancing behaviors) to participants in order to activate reflection on peers and places to meet their personal goals regarding substance use. Table 1 provides a summary of PNC component parts, duration, and approach.

Prior to the PNC intervention, participants complete an assessment of their cannabis use and close peers' risk and protective behaviors, as well as values and plans related to cannabis use. These data are then used to provide personalized feedback during the in-person intervention session. PNC is structured into four component parts: (a) rapport building and presentation of cannabis use feedback, (b) discussion of cannabis use likes/dislikes, goals, and discrepancies, (c) introduction of peer relations information and feedback, and (d) change talk and action plans. Participants are provided the opportunity to critically examine the composition of their close peer networks as well as temporal and place-based considerations (e.g., amount of time spent at particular locations).

1.3.2. Adapting PNC into PNC-txt

We initially began PNC-Text Message Version (PNC-txt) using a dosage of 30 texts delivered over five days and had promising results in increasing readiness to change problematic alcohol use with young adults (Mason et al., 2014) and in reducing tobacco use with adolescents (Mason, Mennis, et al., 2016; Mason, Sabo, & Zaharakis, 2016). However, our meta-analysis on text-based interventions revealed a dose response between outcomes and the number of texts and the length of interventions ($r = 0.69$, $p < 0.01$; Mason, Light, et al., 2015). The first author systematically examined each of the four parts of PNC and translated the hypothesized active ingredients into four weeks of text messages. Each week of PNC-txt corresponds to each component part of PNC. PNC-txt delivers 112 texts over 4 weeks, allowing enough time to cover PNC components in detail, but not burdening participants. The total estimated time to complete PNC-txt is approximately 20 min.