

Development of a Personalized, Real-time Intervention (PFIscope+EMI)

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STUDY PROTOCOL

Emerging adulthood (18-25 years) represents a risky time for mental health and substance use. Emerging adults (EA) are particularly susceptible to problematic patterns of substance use, especially if they experience anxiety and/or depression and use substances as a way to cope with such issues. However, many mental health treatments do not address substance use. We developed an ecological momentary assessment and intervention (EMA/EMI) to specifically target the motive of drinking to cope with anxiety/depression. Project CHOICE was a 6-week intervention that paired in-person normative feedback with daily EMA and, if an individual reported negative affect and intent to drink, an EMI was immediately sent to their phone (a personally-chosen coping skill).

Methods and Materials

Participants and Procedures

Participants (n=20) were recruited from a Young Adult Partial Hospitalization program at a private psychiatric institution. The program runs from 9:00am to 3:30pm, Monday through Friday, for approximately 7 days, serving EA for a variety of psychiatric problems, most commonly depression and anxiety. Many EAs in the program also have co-occurring substance use problems which, although they are assessed at time of entry into the program, specific substance use programming is not offered. Program components include group therapy with 3-4 topics covered daily, individual counseling, and evaluation by an attending psychiatrist (who may prescribe psychiatric medication). Recruitment occurred between September 2018 and February 2019. Patients' medical records were reviewed by study staff in accordance with Institutional Review Board guidelines to assess the inclusion and exclusion criteria. Additionally, participants were screened in-person to verify eligibility.

Inclusion criteria included: being between ages of 18-25, past month alcohol use greater or equal to 2-3 times weekly, a score of 2+ average on the coping scales of the motives measure (see below), current anxiety and depression symptomatology (as measured by scores of 6+ Generalized Anxiety Disorder-7 (Spitzer et al., 2006) corresponding to moderate to severe anxiety, and a score of 16+ on the Center for Epidemiology Studies-Depression scale (Radloff, 1977), corresponding to high risk for clinical depression), and smartphone ownership.

Exclusion criteria included current diagnosis of other moderate/severe substance use disorder (other than alcohol), history of or current psychotic disorder, and current suicidal/homicidal ideation.

Intervention components

This 6-week open pilot was comprised of the following components:

1. Orientation Session. This in-person session with a PhD-level clinical psychologist included: a) normative feedback on their alcohol use compared to other EAs, b) education on the coping motive and negative outcomes associated with use, c) normative feedback regarding the individual's use of alcohol to cope (based on responses to the motives measure as compared with normative samples), d) generation of alternate coping strategies to inform EMI text relapse prevention messages (e.g., try taking a walk if you feel like drinking, calling a friend has helped you in the past when you feel down or want to drink), e) installation of the smartphone app (mEMA, designed by *ilumivu*) on the individual's smartphone, and f) orientation to components and timeline of the intervention, including a discussion of methods of increase EMA adherence/compliance. Components a-c were used in the previous PFIcope study (Blevins & Stephens, 2016).

2. EMA Prompts. Following discharge from YAPH, participants received EMA prompts 4x/daily (sent at random times between the hours of 9am-12pm, 12pm-3pm, 3pm-6pm, and 6pm-9pm) through the mEMA app, a HIPAA-compliant web-based platform specifically

developed for EMA. We assessed: (A) current mood at that moment (“RIGHT NOW;” stress, sadness, happiness, excitement, and anger, rated on a scale Likert scale of 1 to 10), alcohol consumption since the previous assessment (yes/no, quantity), drinking intention (yes/non), drinking motives (if drinking was reported, utilizing one item from each subscale of the DMQ-R; enhancement, coping, social, and conformity), the use of coping strategies (14 strategies provided endorsed yes/no; e.g., distraction, active coping), any cannabis use since the previous assessment (yes/no), use of cannabis for substitution of alcohol (yes/no) and motives for cannabis use. A total of 14 questions were included in the EMA. EMA prompts were also available on demand if a participant intended to consume alcohol or reported negative affect and desired the EMI support.

3. EMI Relapse Prevention Coping Skills Messages. The mEMA app allows for individualized programming. As such, messaging can be specifically designed for each participant. If the participant endorsed negative affect or intent to drink on any EMA prompt, an individualized, self-chosen coping skills-based message was immediately sent through the EMA app. Participants picked their individualized coping skills messages in the orientation session from a list of coping strategies that are consistent with cognitive behavioral therapy techniques, and were also encouraged to add their own strategies if they were not listed on the sheet (e.g., “Try reaching out to a friend or family member if you feel down or want to drink”, and the 10-12 messages chosen were randomized to be sent in the event of negative mood and intent to drink. The purpose of these messages was to remind the participant of skills and strategies to reduce the likelihood of drinking to cope.

4. Follow-Up Assessment. At the end of the intervention (6 weeks), participants completed self-report questionnaires and a semi-structured, in-person qualitative interview at the research unit. The purpose of the interview was to determine which aspects of the intervention were helpful and elicit other feedback in order to shed light on acceptability, usability, and utility of the intervention..

Measures

Motives. Alcohol use motives were measured using the Modified Drinking Motives Questionnaire-Revised (MDMQ-R) (Grant et al., 2007), a 28-item assessment derived from the Drinking Motives Questionnaire-Revised (Cooper, 1994). The MDMQ-R measures the following motives: coping with anxiety (“because it helps me when I am feeling nervous”), coping with depression (“to cheer me up when I’m in a bad mood”), conformity (“to fit in with a group I like”), social (“as a way to celebrate”), and enhancement (“to get a high”). Participants are asked to rate on a scale of 1 (almost never/never) to 5 (almost always/always) how frequently they drink for each reason.

Alcohol and Cannabis Use. The Timeline Followback (TLFB) (Sobell & Sobell, 1992) was utilized to measure quantity and frequency of alcohol use. Participants are given anchor points and produce their own anchor points (including holidays, special occasions) to help facilitate memory of alcohol use, and asked to recall alcohol use (drinks per drinking day, DDD). We calculated binge days according to National Institute of Alcohol Abuse and Alcoholism cut-offs (no more than 3 drinks per day for women and no more than 4 drinks per day for men. We also derived a drinks/week variable from the data. Additionally, on each drinking day, participants were asked to report (yes/no) whether their alcohol use was motivated by the coping motive. As such, we created a variable that was the sum number of days that an individual endorsed drinking to cope on the TLFB, which allowed for computation of percentage of drinking days that an individual drank to cope. We also assessed days of cannabis use using the TLFB.

STATISTICAL ANALYSIS PLAN

Preliminary analyses evaluated descriptive statistics of variables of interest for missingness and handled such instances accordingly. Variables were examined for normality and analyses accounted for skewness or kurtosis utilizing bootstrapping methods or transformations. We first present descriptive statistics and correlations between variables, as well as results from analysis of variance (ANOVA) testing examining differences in baseline variables by gender. Main effects of the intervention were analyzed using paired-sample t-tests utilizing measures at baseline and 6-weeks. The primary outcomes of interest were percent days drinking in the last month (using the TLFB) and changes in coping drinking motives (using the MDMQR(Grant et al., 2007)).

References

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