Exploring Statistical Methodologies for a Thematic Analysis of a Novel Cognitive Behavioral Therapy-based Adaptive Intervention for Teens: iDOVE2 LiveText

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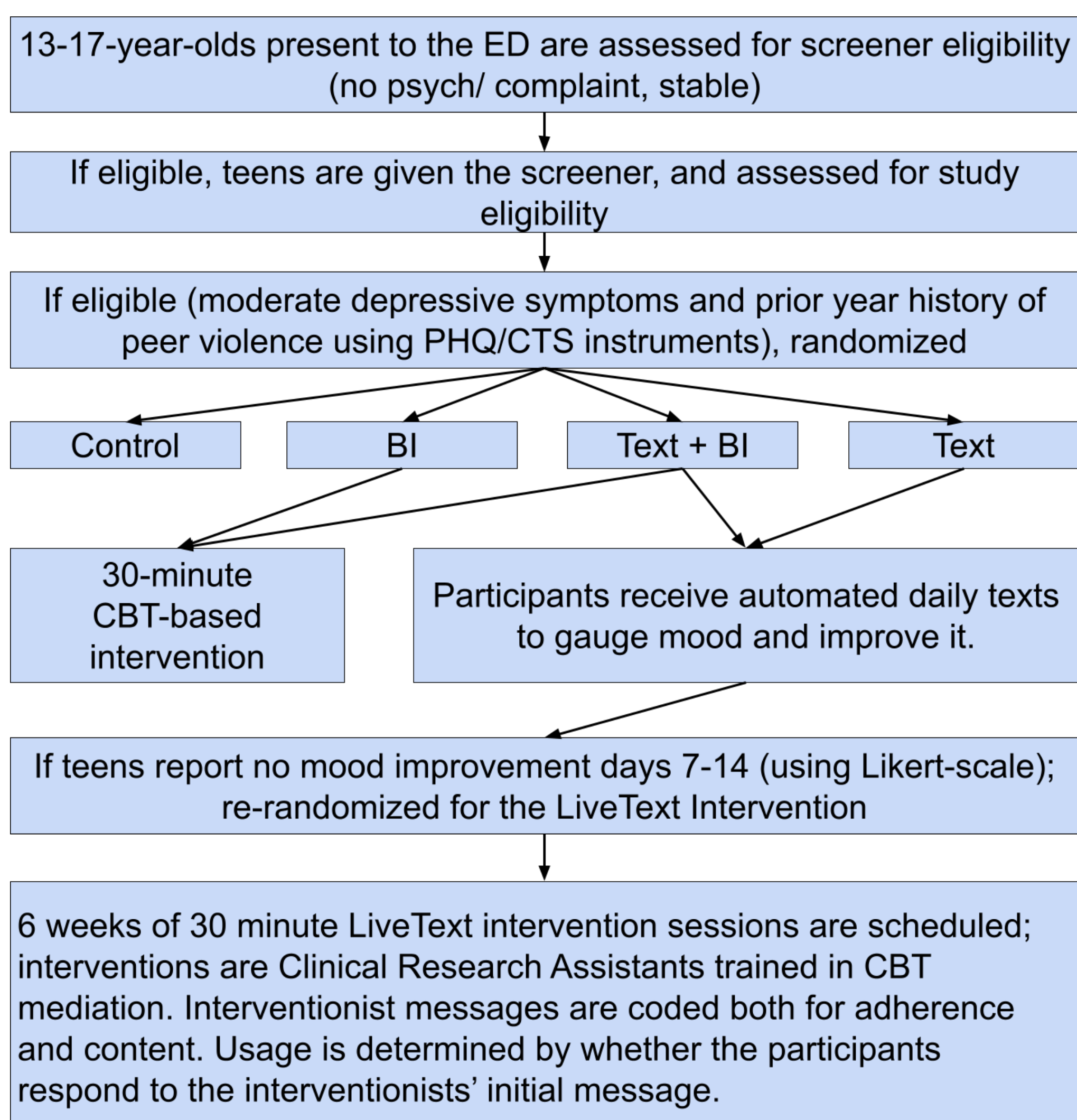
Overview

- **CBT-based interventions can be multi-functional and adaptable based on outcomes.**
- **Latent class modeling can be used to assess CBT-based interventions to advise future intervention implementation.**

Background

- Teens and adolescents in the United States have a higher prevalence of depressive symptoms compared to the early 2000s.[1]
- Despite this increase, there has been little change in access to mental health care nor treatment strategies on a population level.[1]
- In addition to the rise in depressive symptoms, studies show that peer violence exposure increases risks of developing depressive symptoms and perpetuates negative automatic thoughts.[2]
- Cognitive Behavioral Therapy-based strategies and interventions have proven efficacious in decreasing depressive symptoms.[3]
- Latent class modeling has been shown efficacious in understanding patterns of daily mood for this study and should be applied to CBT-dosage patterns in the LiveText sub-arm.[4]

Study Methods

13-17-year-olds present to the ED are assessed for screener eligibility (no psych/ complaint, stable)

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If eligible, teens are given the screener, and assessed for study eligibility

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If eligible (moderate depressive symptoms and prior year history of peer violence using PHQ/CTS instruments), randomized

Control | BI | Text + BI | Text

30-minute CBT-based intervention

Participants receive automated daily texts to gauge mood and improve it.

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If teens report no mood improvement days 7-14 (using Likert-scale); re-randomized for the LiveText Intervention

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6 weeks of 30 minute LiveText intervention sessions are scheduled; interventions are Clinical Research Assistants trained in CBT mediation. Interventionist messages are coded both for adherence and content. Usage is determined by whether the participants respond to the interventionists' initial message.

Statistical Methodologies for Analysis

- Usage rates of the intervention across those randomized to receive LiveText.
- Cognitive Behavioral Therapy-based technique usage rates (i.e., are emotion regulation themes and techniques used more often than behavioral activation themes?).
- Distribution of thematic codes across sessions (i.e., how often are cognitive reappraisal techniques used throughout the six-week program?).
- Regression models to explore thematic code-usage across participant characteristics (demographics, weekly mean mood scores etc.).
- Using least common multiple to assess patterns of dosage across LiveText sessions.
- Analysis of whether mood scores generally increase after LiveText intervention sessions, or number of sessions through regression.
- Latent class analysis was used in previous iterations of this study and found divergence at day 7 of the daily reported mood scores. [4]
- Latent class analysis could be leveraged to provide insights on classes mood improvement based on the dosage of discrete CBT principles (i.e., increased mood based on amount of emotion regulation techniques used).
- Latent class analysis could also be used to find inherent classes based on sociodemographic factors.

Implications

- These proposed analyses could provide insight on how participants are engaging with the intervention.
- Results will provide insights on how the intervention can be tailored (particularly interventionist training) to focus on the most used themes of CBT
- Assessing for latent classes of participants based on mood score can provide insights to predict patient outcomes based on interventionist emphasis.
- Latent class analysis, if successful here, could be used in predictive analytics for predicting intervention outcomes and result in referrals to more advanced care based on prediction models.
- Finding divergence across a certain time-period or dosage of the intervention could provide insights into if more advanced interventions would prove beneficial.
- LiveText provides rich and complex data that will give meaningful insights into adolescent mental health treatment; especially if this low-resource digital-health intervention shows positive outcomes.
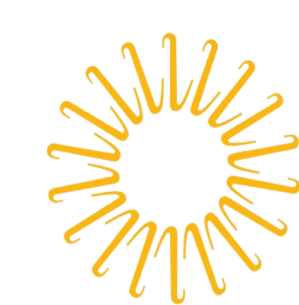
References & Figures
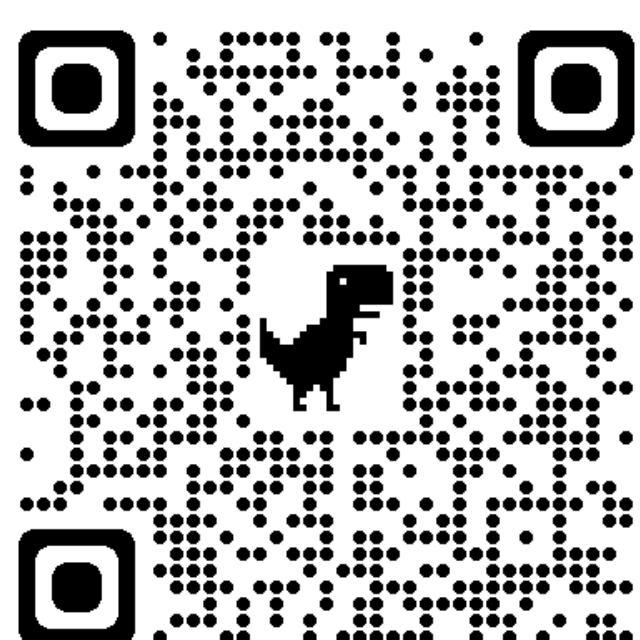
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