Use of Reminder Messages to Improve Utilization of an Automated Telephone-Based Treatment for Methadone Patients

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Opioid Use Disorder

• From 2002-2013, there was an increase in heroin addiction among 18-25 year olds and the number of people who started to use heroin in the past year increased (CDC, 2014).

• In 2014, 1.9 million Americans had prescription opioid use disorder and 586,000 had heroin use disorder (SAMHSA, 2015).

• The rate of overdose deaths involving opioids has almost quadrupled since 1999 (CDC, 2015).
  – More deaths in 2014 were due to drug overdoses than any other year on record, with the majority of overdose deaths involving opioids (CDC, 2015).
  – 78 deaths in America per day (CDC, 2015).
  – Heroin overdose deaths among women have tripled in the last few years (Hedegaard et al., 2015).
Treatment for Opioid Use Disorder

- Continued drug use among agonist-maintained patients is common and associated with high rates of relapse and treatment drop-out (Sullivan et al., 2010; Maremmani et al., 2007).
- Counseling has been shown to be effective but it is costly and requires additional patient involvement (O'Brien et al., 1995).
- Some patients dislike counseling, while others have responsibilities that make attendance difficult (Connors et al., 2001).
- There is a clear need to develop additional acceptable and cost-effective treatments.
- Women seeking treatment were more likely than men to engage in electronic-based, supplemental treatments, and commonly cited 24-hour access and privacy as reasons for engagement (VanDeMark et al., 2010; White et al., 2010).
Therapeutic Interactive Voice Response (TIVR)

- Low Cost
- Mobile - highly flexible and convenient
  - Available 24 hours/day
  - Available for any phone anywhere
  - In patient’s natural environment
- High accessibility
  - Rural areas and places with low access to treatment or few trained providers.
- Low “high tech”
  - Can be utilized by participants of all ages without training
  - More secure and less open to attacks than web or mobile web systems
- Easy to adapt and change content based on feedback and updates in the science.
Reminder Text Messages

- In the pilot trial, participants made fewer calls than expected and noted that they often forgot to call. Reminder messages may increase Recovery Line use and thus, efficacy.

- Optimal reminder message latency has not been previously evaluated.
  - We chose to evaluate 3 levels of latency (immediate, short, and long).

- In addition, some patients find simple reminders undesirable and the effects tend to dissipate over many repetitions (Wise & Operario, 2008).
  - More complex and varied messages may be more sustainable for continued use.

- We chose to evaluate message frame, providing all participants with gain and loss-framed messages.
  - They can be presented briefly and have been evaluated with substance dependent populations (Toll et al., 2007; Fucito et al., 2010; Moorman, van den Putte, 2008).
Study Design

28 days of 24-hour system access

Intake Assessment

System Orientation
Instructed to call as needed but recommended daily calls
Created a “call window”

Randomization

Immediate
Text at +0 hours

Short Delay
Text at +4 hours

Long Delay
Text at +50 hours

Follow-up Assessment
Participants

- 67 participants completed the study
  - Mean age = 41.0 years (11.0)
- Inclusion criteria
  - At least 18 years old
  - Currently receiving methadone maintenance treatment
  - Illicit drug use in the past 30 days or have a positive urine screen for any tested illicit drugs
- Exclusion criteria
  - Current suicide or homicide risk
  - Active psychosis
  - Unable to read or understand English

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Immediate</th>
<th>Short Delay</th>
<th>Long Delay</th>
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<tbody>
<tr>
<td>Gender</td>
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</tr>
<tr>
<td>Male</td>
<td>50% (11)</td>
<td>52% (12)</td>
<td>50% (11)</td>
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<tr>
<td>Female</td>
<td>50% (11)</td>
<td>48% (11)</td>
<td>40% (11)</td>
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<td>Race</td>
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<td>White: Non-Hispanic</td>
<td>81% (17)</td>
<td>77% (17)</td>
<td>73% (16)</td>
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<tr>
<td>Other</td>
<td>19% (4)</td>
<td>23% (5)</td>
<td>27% (6)</td>
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Methods

- **Outcome Measures**
  - Recovery Line system utilization
    - Number of calls, minutes, calls after a text
  - Substance use
    - Timeline Followback assessment
  - Coping
    - The Effectiveness of Coping Behaviours Inventory

- **Data Analysis**
  - T-tests and Chi-Square were used to evaluate differences in demographic and clinical characteristics and study outcomes.
  - Mixed factor ANOVA and GLM was used to evaluate outcome variables by gender and assigned condition.
Results: Calls Per Week

- Calls per week across the 4-weeks (p=.003).
- In weeks 1 & 2, Immediate and Short Delay conditions had more calls than Long Delay (p=.005).
Results: Total Call Minutes

- Call minutes differed for males between Short Delay and Long Delay ($p < .001$).
Results: Other Outcomes

- No differences in call response for gain- or loss-framed messages.
- No assigned group or gender differences on ratings of interest, perceived efficacy, or ease of use.
- No assigned group differences on self-reported coping skills efficacy or self-reported substance use.
- Coping efficacy increased for men but not women ($p = .04$).
- Weekly days of substance use decreased over time ($p < .001$).
- Mean call length was positively correlated with substance use.
Summary and Conclusions

• Text message reminders may increase utilization of an automated mobile treatment but the effects may disipate over time.
  – Effects may differ by gender.

• No difference between groups in self reported days of substance use, coping efficacy, or system ratings.

• Future studies:
  – Three-month study period with methadone maintained patients.
  – Five-week treatment extender with a SUD Veteran population.
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