Sequential multiple assignment randomized trial (SMART) adaptive studies for SUD

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Problems in SUD treatment

- High dropout rate
- PTs’ mixed reactions to “standard care” in the treatment system:
  - Behavioral interventions
  - Group counseling
  - 12-step model (i.e., AA approach)

- Currently, treatment seekers with substance use disorders (SUD) really do not have many TX options
Adaptive Treatment Study

- Research Questions
  - Does offering patients who do not engage in treatment a choice of other interventions improve outcomes?
  - Does offering patients who engage but then drop out a choice of other interventions improve outcomes?
  - Does a second attempt to offer TX choice to non-engagers improve outcomes?
Tailoring Variable

- We are tailoring on IOP attendance (rather than substance use)

- Definition of “disengaged” was derived through an expert consensus process

- At 2 weeks: failure to attend any treatment in the second week following intake

- During weeks 3-7: failure to attend any IOP sessions for two consecutive weeks

- At 8 weeks: failure to attend any IOP sessions in prior two weeks
Treatment Sites and Patients

- Participants recruited from IOPs in publicly funded and VA programs
- Participants enrolled at intake
- Two studies:
  - Cocaine dependent (N=300), 80% with alcohol dependence
  - Alcohol dependent (N=200), 40% with cocaine dependence
- Typical participant: African-American male, around 40yo
Adaptive Protocol With Patient Choice

Intake to Specialty Care (IOP)

Monitor for Two weeks

Self-Selection

Engaged Patients

Telephone MI For IOP Engagement

Randomization

Non-Engaged Patients

Telephone MI With Choice of TX Option

Week 2

Week 8

Now Engaged

Still Non-Engaged

Second Randomization

CBT

Medical Management

Stepped Care

IOP

TEL MI W/Choice

No Further MI Calls
Monthly Outcome Measures

- Alcohol Use (for alcohol dependent Pts)
  - Any use and any heavy use
  - Frequency of any and heavy use

- Cocaine Use (for cocaine dependent Pts)
  - Any use
  - Frequency of use
  - Urine toxicology
Study Participation

- Engaged/Disengaged at Week 2:
  - Study 1—188 (63%) / 112 (37%) of 300
  - Study 2—123 (62%) / 77 (38%) of 200

- Disengaged Weeks 3-7:
  - Study 1—43 (23%) of 188 engaged at W2
  - Study 2—24 (20%) of 123 engaged at W2

- Still disengaged at Week 8:
  - Study 1—66 (59%) of 112 disengaged W2
  - Study 2—43 (56%) of 77 disengaged W2
What non-engaged MI-PC PTs select in weeks 2-7:
What non-engaged MI-PC PTs select at week 8: (at re-randomization)

- CBT: 10
- IOP: 5
- Telephone: 5
- Medication: 2
- Nothing: 25
Main Effects Analyses

Alcohol Use in Patients Disengaged at 2 weeks
Any Alcohol Use in Month

**Study 1**

- p = .012

**Study 2**

- p = .028
Days of Alcohol Use per Week

**Study 1**

- MI-IOP
- MI-PC

**Study 2**

- MI-IOP
- MI-PC

*p = .02

*p = .015
Alcohol outcomes in combined sample (161 of 428 alc dep)

- Any drinking:
  - OR = 0.40, p = .0007

- Any heavy drinking
  - OR = 0.33, p = .001

- Frequency of drinking
  - B = -1.08, p = .009

- Frequency of heavy drinking
  - B = -1.09, p = .003

MI-PC = 0, MI-IOP = 1
Main Effects Analyses

Alcohol Use in Patients Disengaged between weeks 3 and 7
Disengaged in weeks 3-7 in combined sample (N=73)

- Any alcohol use
  - OR = 0.54, p = .16

- Any heavy alcohol use
  - OR = 0.67, p = .36

- Frequency of use
  - B = -0.84, p = .23

- Frequency of heavy use
  - B = -1.03, p = .10

MI-PC = 0, MI-IOP = 1
Main Effects Analyses

Alcohol Use in Patients Disengaged at both 2 and 8 weeks
Disengaged at weeks 2 and 8 in combined sample (N=86)

- Any alcohol use
  - OR = 1.12, p = .79

- Any heavy alcohol use
  - OR = 1.43, p = .45

- Frequency of use
  - B = -0.34, p = .58

- Frequency of heavy use
  - B = 0.02, p = .97

MI-PC = 1, no further outreach = 0
Main Effects Analyses

Cocaine Use Outcomes
Cocaine use (N= 409)

- PTs disengaged at w2 (N=159):
  - NS (P values .13 to .86)
- PTs disengaged in w3-7 (N=69):
  - NS (p values .16 to .74)
    (results in direction of IOP better than PC)
- PTs disengaged w2 and w8 (N=84):
  - NS (p values .14 to .42)
    (results in direction of NFO better than PC)
Conclusions

- Providing substance dependent patients who fail to engage in IOP a choice of other treatment options does not improve alcohol or cocaine use outcomes.

- In fact, outreach *without a choice of other treatments* leads to better alcohol use outcomes in those who do not engage in IOP initially.
Conclusions

- Also, no advantage to providing a choice of interventions to patients who engage initially but then drop out.
- Finally, providing further outreach with a choice of interventions to those not engaged at 2 and 8 weeks did not improve substance use outcomes compared to no further outreach.
- Possible exception: patients with past rather than current dependence at intake.
Encouraging results

- It is possible to successfully implement a SMART project in SUD patients
- Use of telephone MI made it possible to at least reach most patients after 1\textsuperscript{st} and 2\textsuperscript{nd} randomization, even though they were not engaged in treatment.
Challenges in Adaptive Treatment for Substance Dependence

- PTs who are doing badly are hard to reach and are often unwilling to participate further in treatment of any sort.
- Mechanisms of action in behavioral treatment options may not be sufficiently different that PT doing poorly in one will respond to another.
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