

# **The age of “feeling in-between”: Factors that influence emerging adult outcomes during and after residential substance use disorder treatment**

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# Disclosures

- Data collection funded by anonymous donation to Butler Center for Research at Hazelden/Betty Ford and by an NIAAA R21 (PI: Kelly; R21AA018585)
- Dr. Bergman's effort toward manuscripts outlined here occurred primarily during his post-doctoral fellowship, funded by the Recovery Research Institute (RRI)



# Objectives

To outline investigations from a sample of 18-24 year old individuals who attended residential substance use disorder (SUD) treatment examining:

- 1) During-treatment clinical changes and outcomes across the first post-treatment year
  - Co-occurring mood and anxiety disorders
- 2) The effects of 12-step mutual-help participation on abstinence across the first post-treatment year
  - Co-occurring mood and anxiety disorders
- 3) The association between professional continuing care activities and abstinence across the first post-treatment year



# Background

- Focus on emerging adulthood (transition-age youth)
  - SUD profiles for 18-25 more similar to 26+, but treatment seeking more similar to 12-17 in the NSDUH (Bergman & Kelly, unpublished data, 2015)
- What recovery-related activities help boost treatment outcomes, and what types of psychiatric phenomena (e.g., co-occurring disorders; COD) might moderate effects of these activities?
  - Any psychiatric illness, more depressive symptomatology, and psychiatric severity generally predict poorer SUD treatment outcomes in adults, and adolescents, though not in all cases
  - COD patients constitute greater proportion of treatment-related financial burden



# The Dataset

- 302 emerging adults (18-24) recruited from the Hazelden Center for Youth and Families (now Hazelden Betty Ford) from October 2006 to March 2008, followed during residential SUD treatment ( $M = 25.5$  days) and up to 1 year post-discharge
- “State-of-the-art”, 28-day abstinence-based Minnesota Model
  - Evidence-based SUD treatment (e.g., 12-step facilitation)
  - Recreational and spiritual care
  - Integrated psychiatric assessment, evidence-based psychological intervention, psychotropic medication as determined by multidisciplinary team
- Follow-up rates based on presence of substance use data
  - Discharge, 87.4% ( $n = 264$ )
  - 1 month, 83.4% ( $n = 252$ )
  - 3 months, 80.5% ( $n = 243$ )
  - 6 months, 72.5% ( $n = 219$ )
  - 12 months, 70.2% ( $n = 212$ )



# Measures

- Percent days abstinent (PDA)
- Substance use consequences (InDUC-2R)
- Dependence severity (Leeds)
- Diagnostic profiles (DSM-IV)
- Psychiatric symptoms (Global Severity Index [GSI] of the Brief Symptom Inventory-18)
- Self-efficacy (Single item)
- Motivation (Single item and Commitment to Sobriety)
- Coping skills (Abstinence-Focused Coping)
- Addiction Treatment Attitudes (ATAQ)
  - Commitment to AA/NA
  - Avoiding Risky Situations



# Participants

- $n = 300$  with DSM-IV data
- $M$  age = 20.4 (SD = 1.6)
- 95% Caucasian; 74% Male
- 44% with high school diploma and 40% with at least some college
- 38% of non-students were employed
- Half from areas where median household income below \$56K
- Compared to private and public sector SUD treatment patients, sample more likely to be Caucasian; similar on other demographics

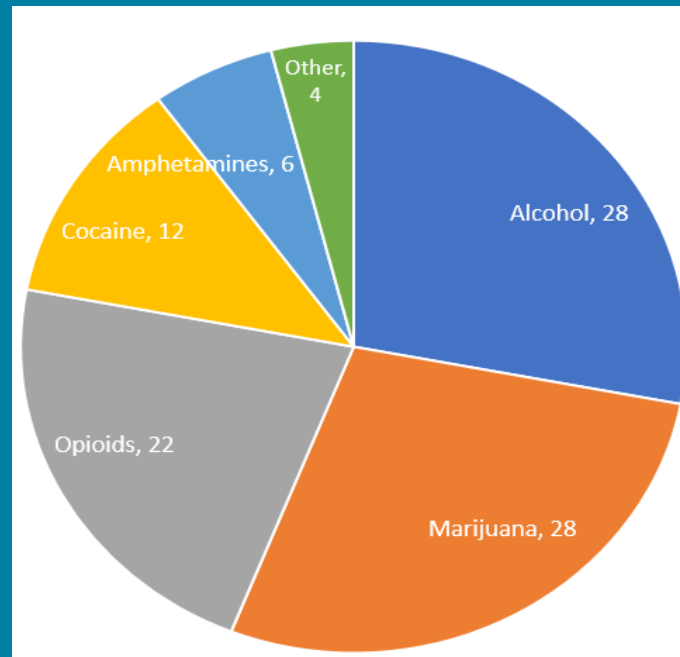


# Participants

## Lifetime SUDs

- 75% alcohol and cannabis
- 45% cocaine
- 35% opioid

## Primary substance





# Participants

- 47% COD, SCID-derived ( $n = 141$ )
  - 1/3 MDD
  - 1/4 GAD
  - 1/4 Social Phobia
- Clinical profile at intake
  - PDA = .24
    - .55 among ARMS young adults ( $d = - 1.12$ )
  - Dependence severity = 19 (0-30)
    - 8.5 among ARMS young adults ( $d = 1.35$ )
  - Substance use consequences = 65.48 (0-150)
    - Tonigan et al. (2002): 80 among inpatient adults and 62 among outpatient adults
  - 27% hospitalized for SUD in prior year
  - More than half arrested in prior year



# Study 1

Does presence of co-occurring SUD/psychiatric disorders (COD) moderate change on clinical targets during treatment and outcomes across the post-treatment year?





## “Ready, willing, and (not) able” to change: Young adults’ response to residential treatment

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12 step

### ABSTRACT

**Background:** Young adulthood represents a key developmental period for the onset of substance use disorder (SUD). While the number of young adults entering treatment has increased, little is known about the mechanisms of change and early recovery processes in this important clinical population. This study investigated during-treatment change in key therapeutic processes (psychological distress, motivation, self-efficacy, coping skills, and commitment to AA/NA), and tested their relation to outcome at 3 months post-treatment. **Methods:** Young adults undergoing residential treatment ( $N=303$ ; age 18–24; 26% female; 95% Caucasian) were enrolled in a naturalistic prospective study and assessed at intake, mid-treatment, discharge, and 3 months following discharge. Repeated-measures and regression analyses modeled during-treatment change in process variables and impact on outcome. **Results:** Statistically significant medium to large effect sizes were observed for changes in most processes during treatment, with the exception of motivation, which was high at treatment intake and underwent smaller, but still significant, change. In turn, these during-treatment changes all individually predicted 3-month abstinence to varying degrees, with self-efficacy emerging as the sole predictor in a simultaneous regression. **Conclusions:** Findings help to clarify the mechanisms through which treatment confers recovery-related benefit among young adults. At treatment intake, high levels of abstinence motivation but lower coping, self-efficacy, and commitment to AA/NA, suggests many entering treatment may be “ready and willing” to change, but “unable” to do so without help. Treatment appears to work, in part, by helping to maintain motivation while conferring greater ability and confidence to enact such change.

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# Prelim: Positive Response Overall to Residential SUD Treatment

**Table 1**

Means, standard deviations, effect sizes, and significance tests of during-treatment change in process variables.

Process variable	Intake mean (SD)	Discharge mean (SD)	% change	Effect size <i>d</i>	Effect size interpretation
Distress	63.4 (10.0)	53.4 (8.7)	-16	1.09	Large
Abstinence motivation	9.1 (1.8)	9.4 (1.3)	3	0.17	Small
Abstinence self-efficacy	7.0 (2.5)	8.4 (1.8)	20	0.55	Medium
Abstinence coping	42.4 (10.8)	48.6 (9.0)	15	0.66	Medium-large
AA/NA commitment	21.8 (5.0)	24.4 (4.1)	12	0.66	Medium-large

- Significant and medium/large during-treatment improvements
- Not pictured, self-efficacy response strongest predictor of 3-month abstinence (52% increased odds of abstinence [yes/no] for each 1 point increase in self-efficacy)





Contents lists available at [ScienceDirect](#)

## Journal of Substance Abuse Treatment



### Young adults with co-occurring disorders: substance use disorder treatment response and outcomes

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#### ABSTRACT

Compared to other life stages, young adulthood (ages 18–24) is characterized by qualitative differences including the highest rates of co-occurring substance use and psychiatric disorders (COD). Little is known, however, regarding young adults' response to substance use disorder (SUD) treatment, especially those with COD. Greater knowledge in this area could inform and enhance the effectiveness and efficiency of SUD care for this patient population. The current study investigated differences between 141 COD and 159 SUD-only young adults attending psychiatrically-integrated residential SUD treatment on intake characteristics, during-treatment changes on clinical targets (e.g., coping skills; abstinence self-efficacy), and outcomes during the year post-discharge. Contrary to expectations, despite more severe clinical profiles at intake, COD patients showed similar during-treatment improvements on clinical target variables, and comparable post-treatment abstinence rates and psychiatric symptoms. Clinicians referring young adults with COD to specialized care may wish to consider residential SUD treatment programs that integrate evidence-based psychiatric services.

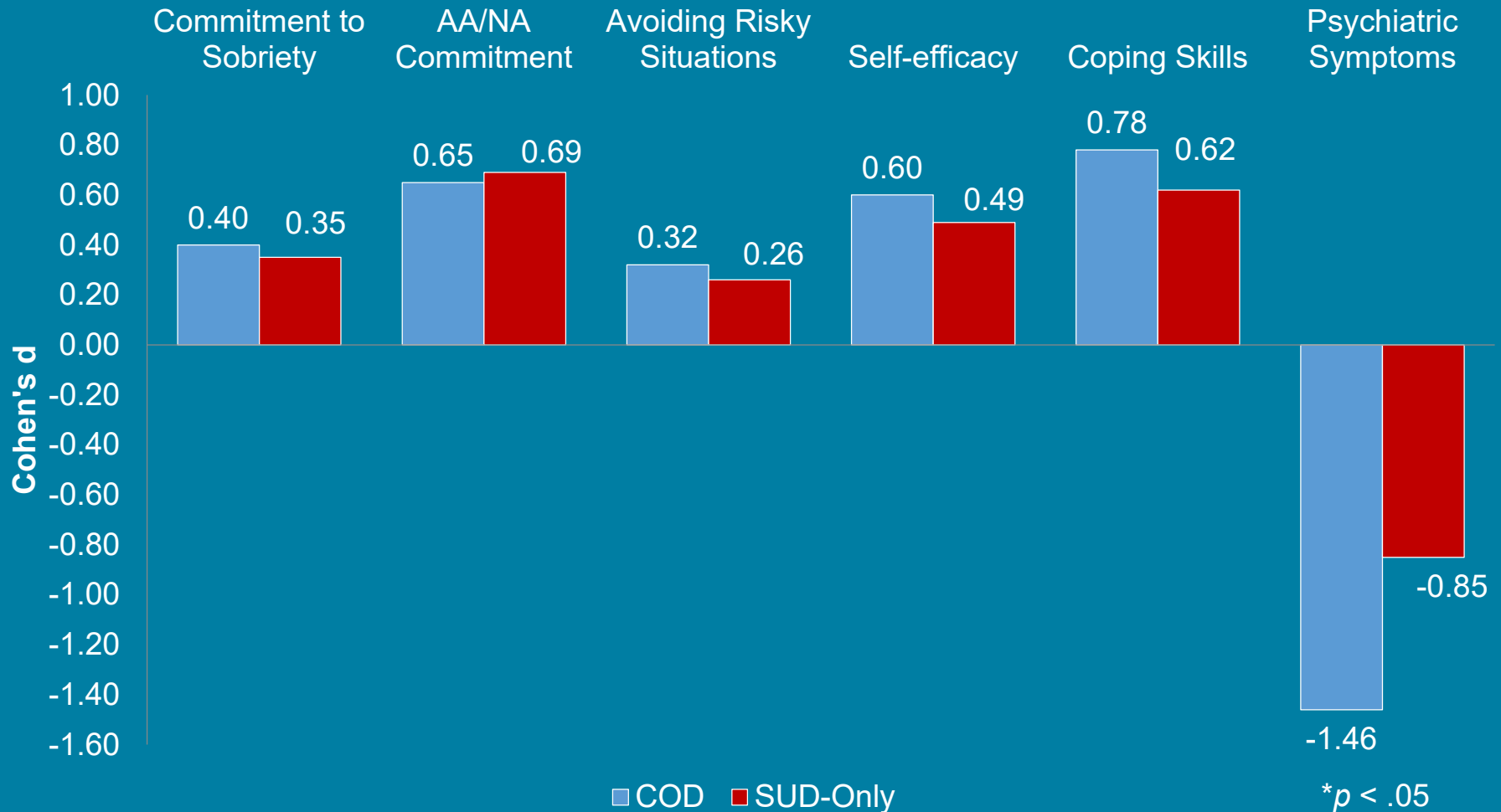


# Intake Differences?

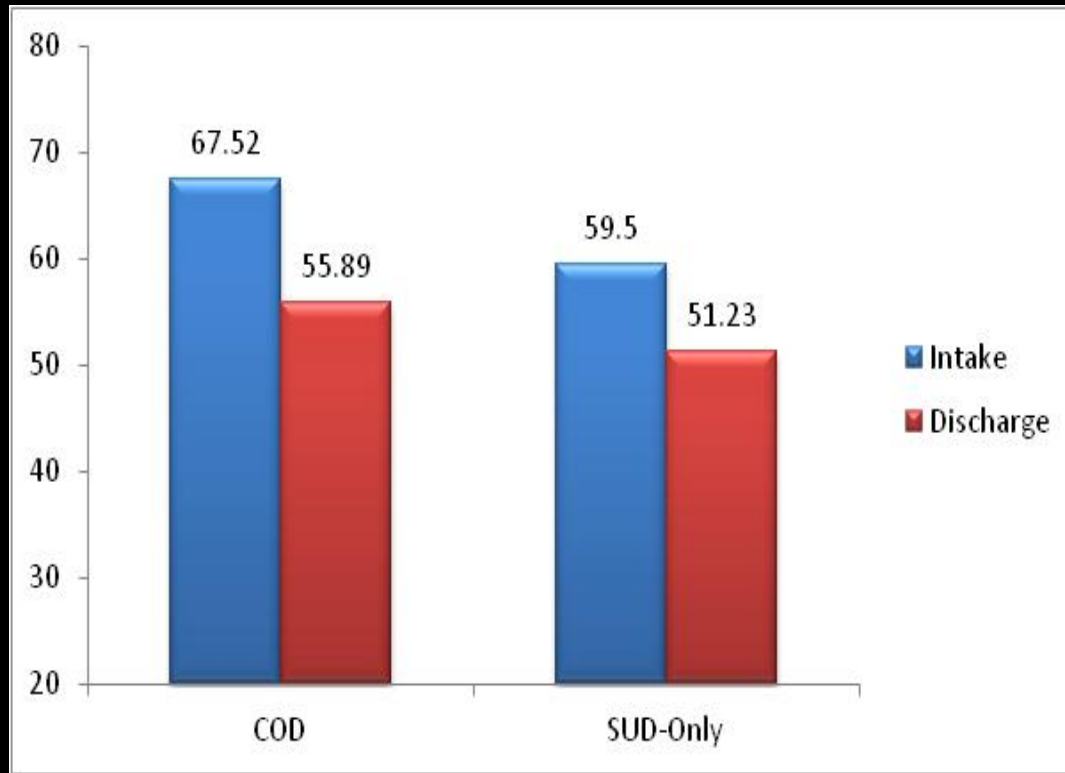
	Significant Differences	Nonsignificant Differences
<b>Demographics</b>	Female (+COD; <i>OR</i> = 4.05)	Age Race Education Employment Status
<b>Clinical Profiles</b>	Substance Use Consequences (+COD; <i>d</i> = .47) Dependence Severity (+COD; <i>d</i> = .45) Psychiatric Symptoms (+COD; <i>d</i> = .86)	Prior year arrest Prior year SUD hospitalization PDA
<b>Lifetime SUDs</b>	Alcohol Use Disorder (+COD; <i>OR</i> = 1.72) Polysubstance Dependence (+COD; <i>OR</i> = 2.12) Cannabis Use Disorder (+SUD-only; <i>OR</i> = 2.67)	Opioid Cocaine Amphetamine Anxiolytic Hallucinogenic



# Similar Response to Treatment



# More on Psychiatric Symptoms

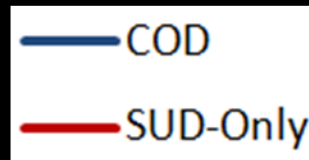
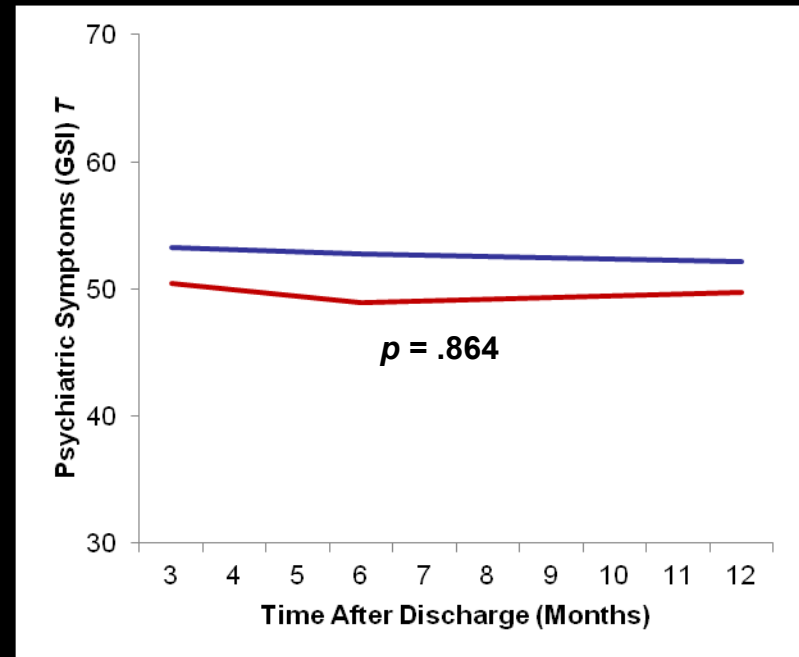
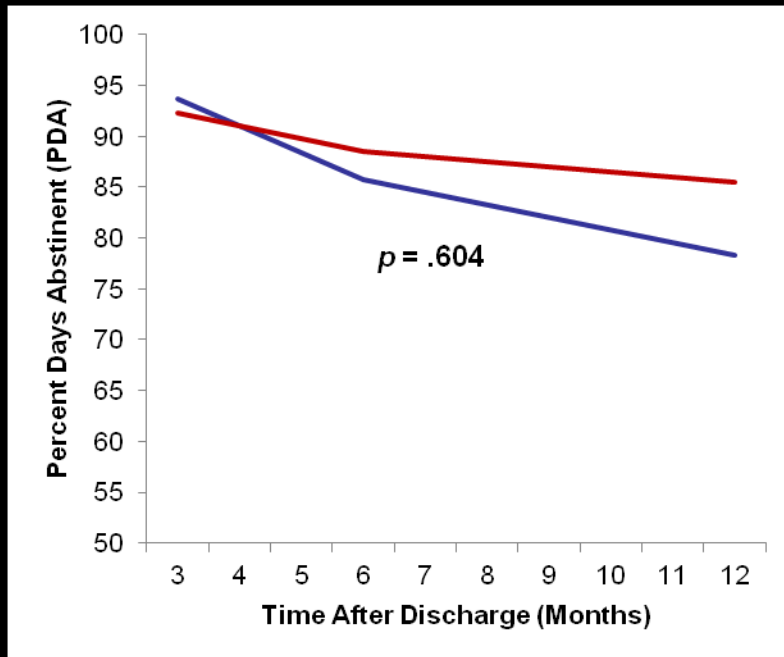


Psych symptoms measured by Global Symptom Inventory of the Brief Symptom Inventory-18 (Depression, Anxiety, and Somatization in the past week; M = 50; SD = 10)





# No Group Differences for PDA or Psychiatric Symptoms



p-values correspond with COD vs. SUD over time controlling for baseline (intake) levels of the outcome, and predictors of study drop-out over time (level of education, treatment length of stay)



# Subsidiary Post-Hoc Analyses

- Examined whether COD patients' more severe profile at intake indicated poorer post-treatment prognosis
- Examined longitudinal associations between psychiatric symptoms, substance use consequences, and dependence severity at intake and PDA
- Association between substance use consequences – more severe among COD – and PDA approached significance ( $p = .051$ )



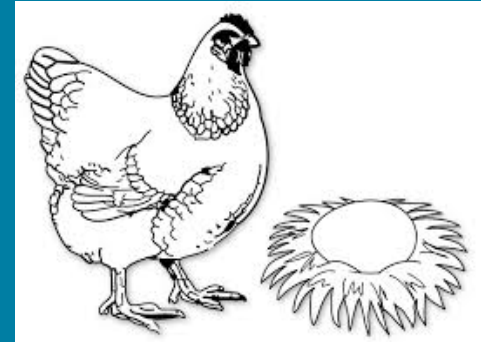
# Summary Study 1

- COD patients had more severe clinical profiles at treatment intake
- Significant and similar improvements on clinical SUD treatment targets (e.g., self-efficacy) compared to their SUD-only peers
  - *More* improvement on psychiatric symptoms
- Analogous PDA and psychiatric symptoms over time
  - Psychiatric symptom disadvantage over time accounted for by symptoms at intake
  - Psychiatrically-integrated residential treatment may help partially offset COD patients' poorer prognosis



# Clinical Implications

- Referral to psychiatrically-integrated residential treatment as a front-line approach for COD youth
- Diagnostically, seemingly independent psychiatric symptoms and emotional distress may be attributable to SUD
- Structured, professional SUD treatments may also facilitate psychiatric improvement



# Study 2

Does presence of COD moderate 12-step participation and derived benefit?



# Background: Mutual-Help Organizations

- Mutual-help organizations (MHOs): “Non-professional, peer-operated organizations devoted to helping individuals who have addiction-related problems” (Humphreys et al. 2004)
- 12-step MHOs (e.g., AA and NA): Encourage abstinence, emphasize disease model of addiction, encourage emotional and spiritual growth, reciprocal helping
- Most commonly sought of all professional and non-professional SUD services (e.g., 53% of “treatment” seekers in 2015 NSDUH)
- Evidence for benefits (and cost-benefits) of 12-step participation – magnified for active involvement vs. attendance
- Potential barriers for emerging adults; lower likelihood of attendance than older adults
- Potential barriers for COD; depends on severity of the psychiatric illness





Contents lists available at SciVerse ScienceDirect

## Drug and Alcohol Dependence

journal homepage: [www.elsevier.com/locate/drugalcddep](http://www.elsevier.com/locate/drugalcddep)



### Emerging adults' treatment outcomes in relation to 12-step mutual-help attendance and active involvement

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#### ABSTRACT

**Background:** Participation in Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) during and following treatment has been found to confer recovery-related benefit among adults and adolescents, but little is known about emerging adults (18–24 years). This transitional life-stage is distinctive for greater distress, higher density of psychopathology, and poorer treatment and continuing care compliance. Greater knowledge would inform the utility of treatment referrals to 12-step organizations for this age-group.

**Methods:** Emerging adults ( $N = 303$ ; 18–24 years; 26% female; 95% White; 51% comorbid [SCID-derived] axis I disorders) enrolled in a naturalistic study of residential treatment effectiveness assessed at intake, 3, 6, and 12 months on 12-step attendance and involvement and treatment outcomes (percent days abstinent [PDA]; percent days heavy drinking [PDHD]). Lagged hierarchical linear models (HLMs) tested whether attendance and involvement conferred recovery benefits, controlling for a variety of confounds.

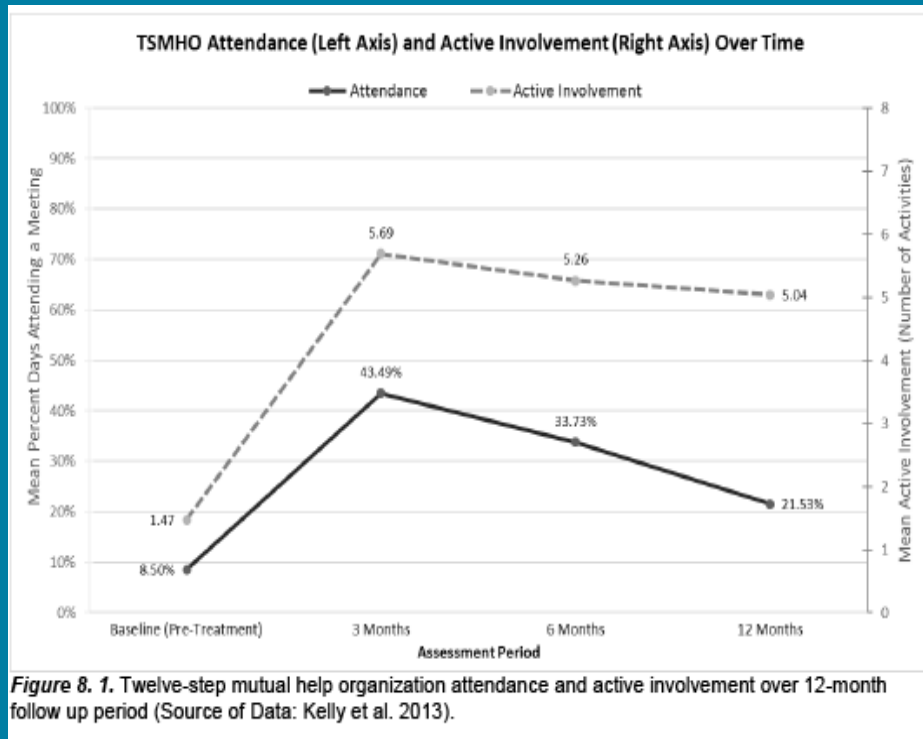
**Results:** The percentage attending 12-step meetings prior to treatment (36%) rose sharply at 3 months (89%), was maintained at 6 months (82%), but declined at 12 months (76%). Average attendance peaked at about 3 times per week at 3 months dropping to just over once per week at 12 months. Initially high, but similarly diminishing, levels of active 12-step involvement were also observed. Lagged HLMs found beneficial effects for attendance, but stronger effects, which increased over time, for active involvement. Several active 12-step involvement indices were associated individually with outcome benefits.

**Conclusions:** Ubiquitous 12-step organizations may provide a supportive recovery context for this high-risk population at a developmental stage where non-using/sober peers are at a premium.

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# Prelim: 12-Step MHO Participation and Benefit



Attendance and active involvement both predicted PDA in lagged, fully-adjusted models (i.e., 3 month attendance on 6 month PDA) – active involvement remained significant when considered simultaneously (considering oneself a member and verbal participation were especially helpful)

In Bergman, B. G., Kelly, J. F., Fallah-Sohy, N., & Makhani, S. (2017). Emerging adults, mutual-help organizations, and addiction recovery: What does the science tell us? In D. C. Smith (Ed.), *Emerging adults in substance use disorder treatment*. New York, NY: Oxford University Press.





# Psychiatric Comorbidity and 12-Step Participation: A Longitudinal Investigation of Treated Young Adults

Brandon G. Bergman, M. Claire Greene, Bettina B. Hoepfner, Valerie Slaymaker, and John F. Kelly

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**Background:** Evidence indicates that 12-step mutual-help organizations (MHOs), such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), can play an important role in extending and potentiating the recovery benefits of professionally delivered addiction treatment among young adults with substance use disorders (SUD). However, concerns have lingered regarding the suitability of 12-step organizations for certain clinical subgroups, such as those with dual diagnosis (DD). This study examined the influence of diagnostic status (DD vs. SUD-only) on both attendance and active involvement (e.g., having a sponsor, verbal participation during meetings) in, and derived benefits from, 12-step MHOs following residential treatment.

**Methods:** Young adults ( $N = 296$ ; 18 to 24 years old; 26% female; 95% Caucasian; 47% DD [based on structured diagnostic interview]), enrolled in a prospective naturalistic study of SUD treatment effectiveness, were assessed at intake and 3, 6, and 12 months posttreatment on 12-step attendance/active involvement and percent days abstinent (PDA). *t*-Tests and lagged, hierarchical linear models (HLM) examined the extent to which diagnostic status influenced 12-step participation and any derived benefits, respectively.

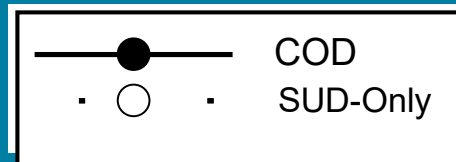
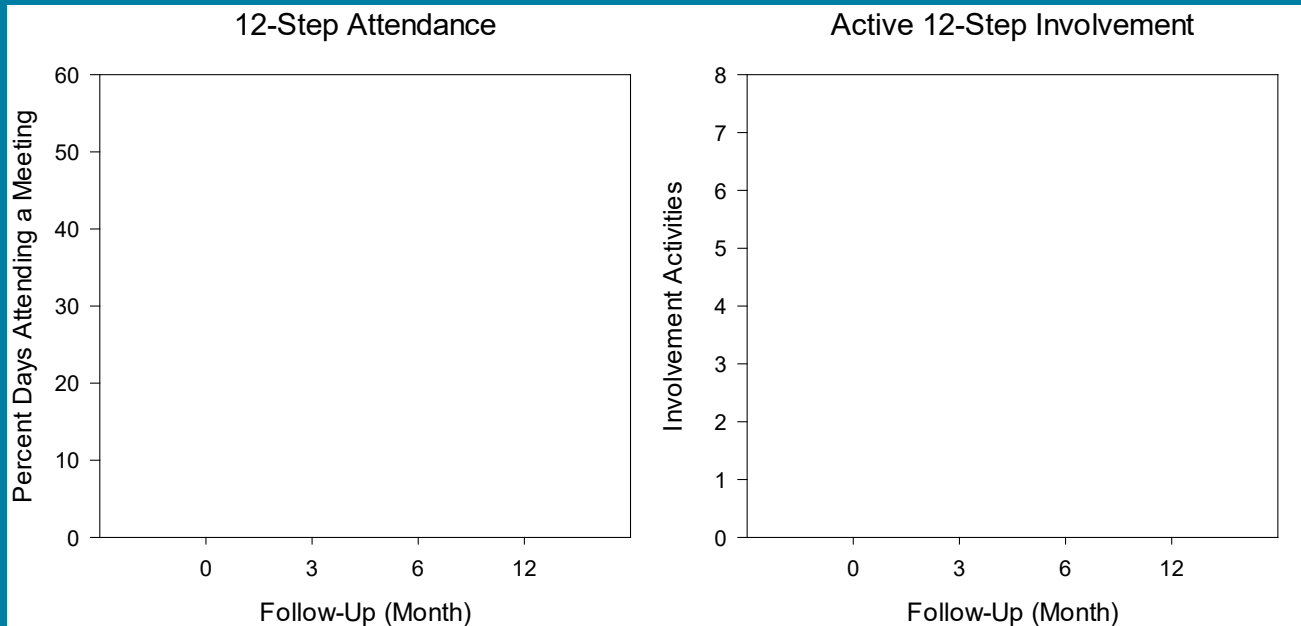
**Results:** For DD and SUD-only patients, posttreatment attendance and active involvement in 12-step organizations were similarly high. Overall, DD patients had significantly lower PDA relative to SUD-only patients. All patients appeared to benefit significantly from attendance and active involvement on a combined 8-item index. Regarding the primary effects of interest, significant differences did not emerge in derived benefit between DD and SUD-only patients for either attendance ( $p = 0.436$ ) or active involvement ( $p = 0.062$ ). Subsidiary analyses showed, however, that DD patients experienced significantly greater abstinence-related benefit from having a 12-step sponsor.

**Conclusions:** Despite concerns regarding the clinical utility of 12-step MHOs for DD patients, findings indicate that DD young adults participate and benefit as much as SUD-only patients, and may benefit more from high levels of active involvement, particularly having a 12-step sponsor. Future work is needed to clarify how active 12-step involvement might offset the additional recovery burden of a comorbid mental illness on substance use outcomes.

**Key Words:** Dual Diagnosis, 12-Step Participation, Young Adults, Co-Occurring Disorders.

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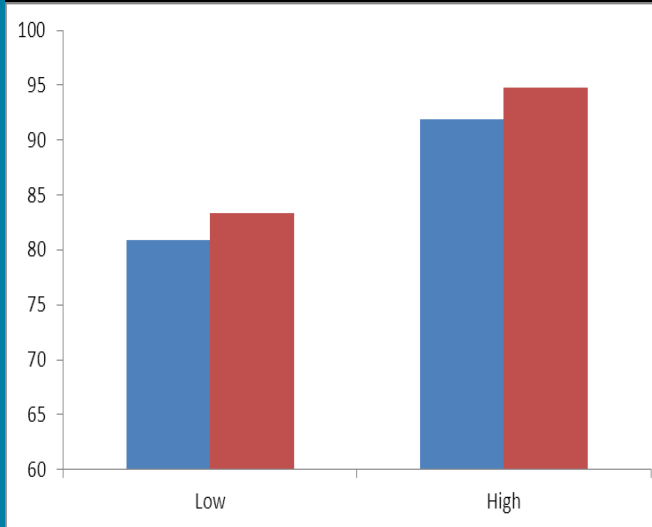


$p < .05$  for attendance and active involvement in lagged models

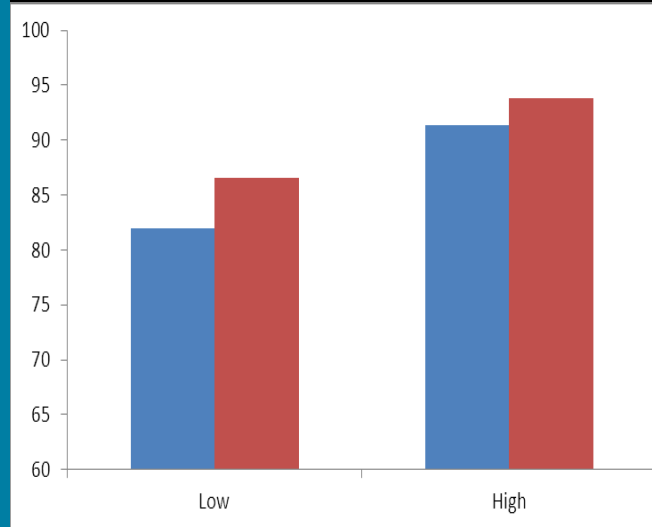
$p < .05$  for COD status in both models (different from study 1)

6 months

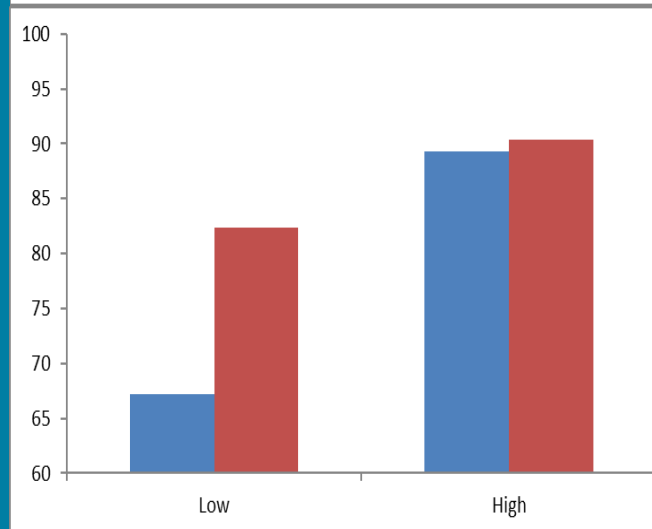
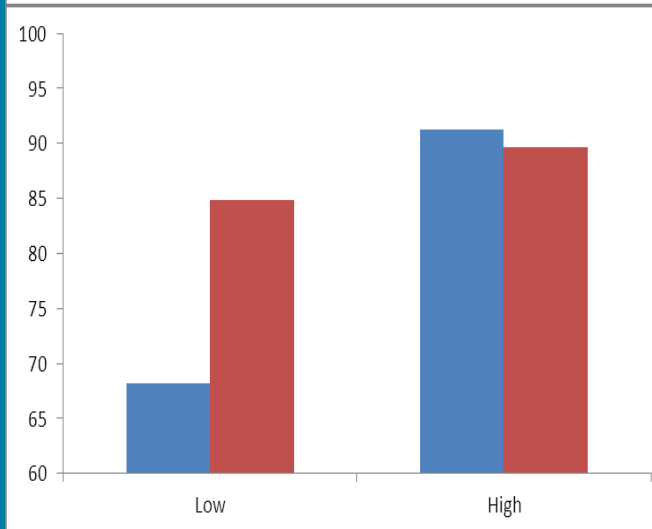
Attendance ( $p = .436$ )



Active Involvement ( $p = .062$ )



12 months



■ COD ■ SUD-Only



# Summary Study 2

- COD patients attended and became actively involved at rates similar to SUD-only patients
- COD patients show attendance and involvement-related improvement on PDA at least as good as SUD-only



# Implications for Treatment and Recovery

- Future work to test if intensive 12-step involvement helps *offset* COD poorer substance use outcome
- Overall, younger COD patients or those with less severe pathology (e.g., depressive or anxiety disorders) appear to benefit from 12-step participation
- Appropriate referral to 12-step groups for COD emerging adults – may need 12-step facilitation that also focuses on obtaining a sponsor (e.g., MAAEZ), not simply a referral



# Study 3

What professional services are associated with enhanced abstinence post-treatment and does 12-step MHO active involvement still predict better outcomes when these services are considered?





## The effects of continuing care on emerging adult outcomes following residential addiction treatment

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### ABSTRACT

**Background:** Professional continuing care services enhance recovery rates among adults and adolescents, though less is known about emerging adults (18–25 years old). Despite benefit shown from emerging adults' participation in 12-step mutual-help organizations (MHOs), it is unclear whether participation offers benefit independent of professional continuing care services. Greater knowledge in this area would inform clinical referral and linkage efforts.

**Methods:** Emerging adults ( $N = 284$ ; 74% male; 95% Caucasian) were assessed during the year after residential treatment on outpatient sessions per week, percent days in residential treatment and residing in a sober living environment, substance use disorder (SUD) medication use, active 12-step MHO involvement (e.g., having a sponsor, completing step work, contact with members outside meetings), and continuous abstinence (dichotomized yes/no). One generalized estimating equation (GEE) model tested the unique effect of each professional service on abstinence, and, in a separate GEE model, the unique effect of 12-step MHO involvement on abstinence over and above professional services, independent of individual covariates.

**Results:** Apart from SUD medication, all professional continuing care services were significantly associated with abstinence over and above individual factors. In the more comprehensive model, relative to zero 12-step MHO activities, odds of abstinence were 1.3 times greater if patients were involved in one activity, and 3.2 times greater if involved in five activities (lowest mean number of activities in the sample across all follow-ups).

**Conclusions:** Both active involvement in 12-step MHOs and recovery-supportive, professional services that link patients with these community-based resources may enhance outcomes for emerging adults after residential treatment.

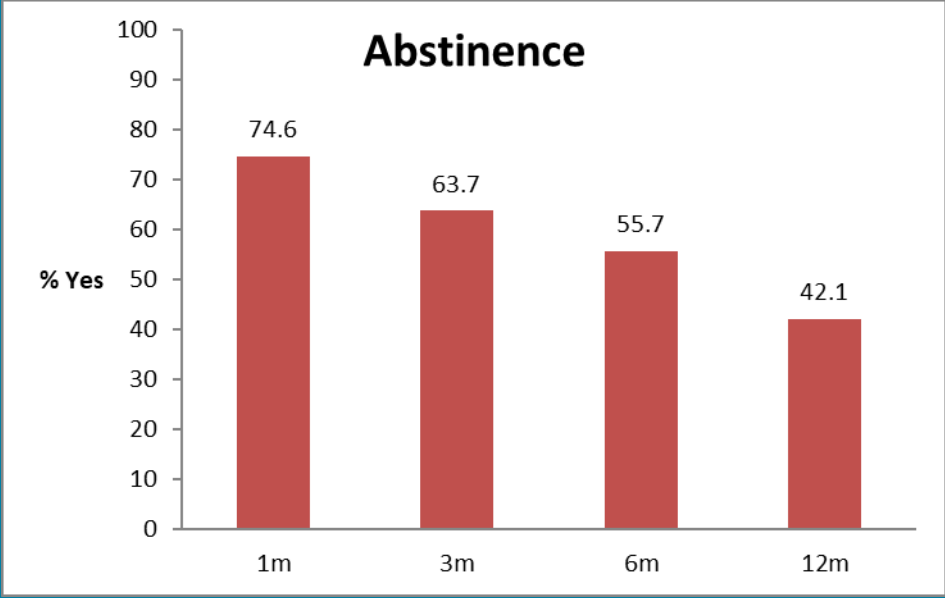


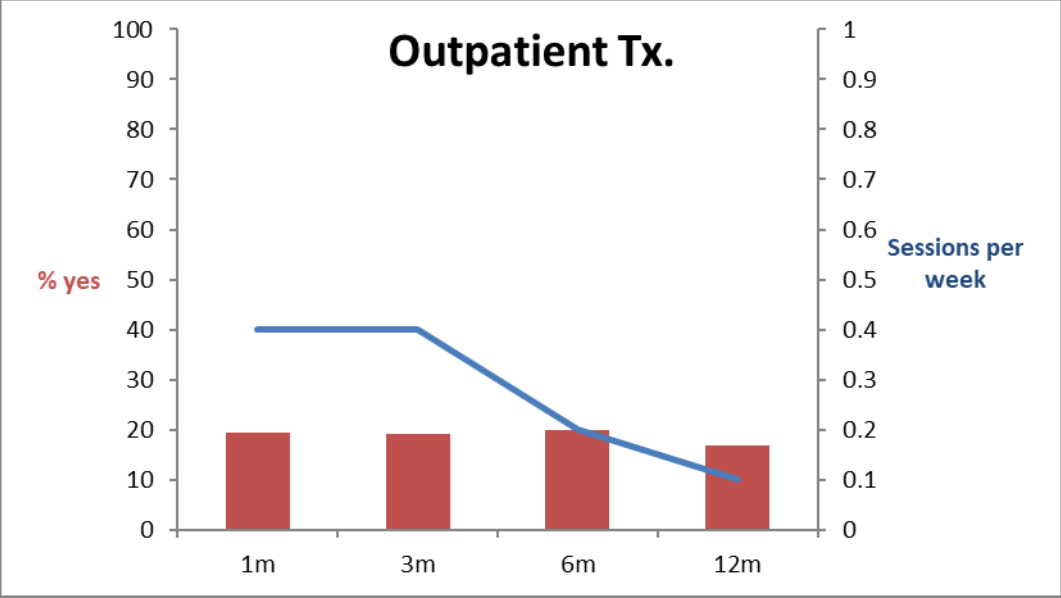
# Background: Continuing Care

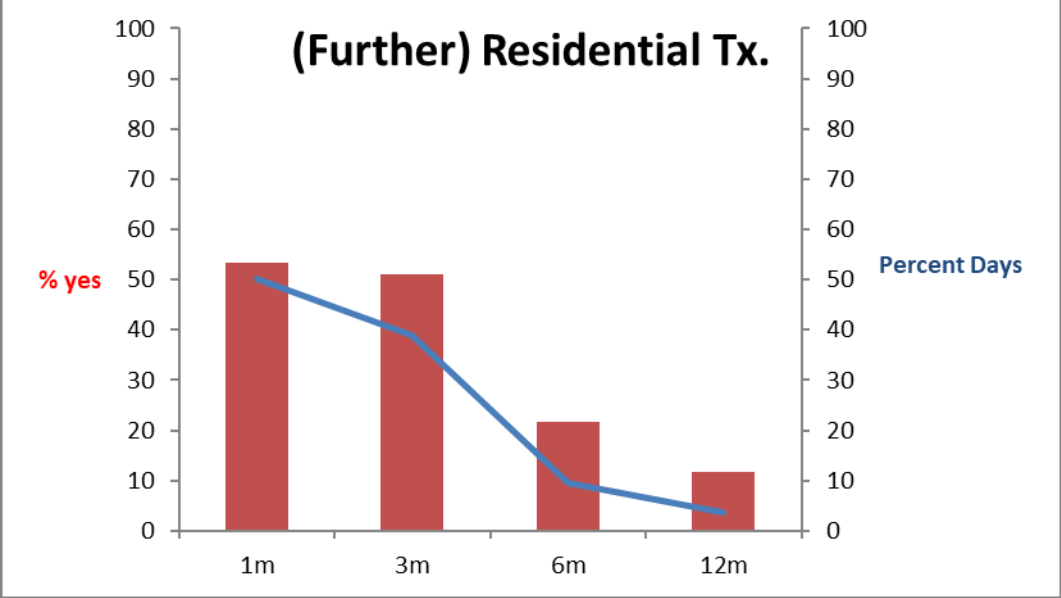
- Chronicity of alcohol and other drug use disorder (AOD)
  - Even in “successful” cases, remission/recovery can take years
- Continuing care can help offset relapse risk, and increase chances of sustaining recovery, among adults and adolescents (Dennis, Scott, & Funk, 2003; Godley et al. 2007; McKay 2009)
- Professional continuing care in this study
  - Further (i.e., step-down) residential treatment (percent days)
  - Outpatient treatment (number SUD group + individual sessions per week)
  - Sober living environment (“recovery residence”; percent days)
  - SUD medication (e.g., buprenorphine, naltrexone, etc.)
- Differences between methods for Study 3 and Studies 1-2
  - Abstinence
  - Contemporaneous vs. lagged models

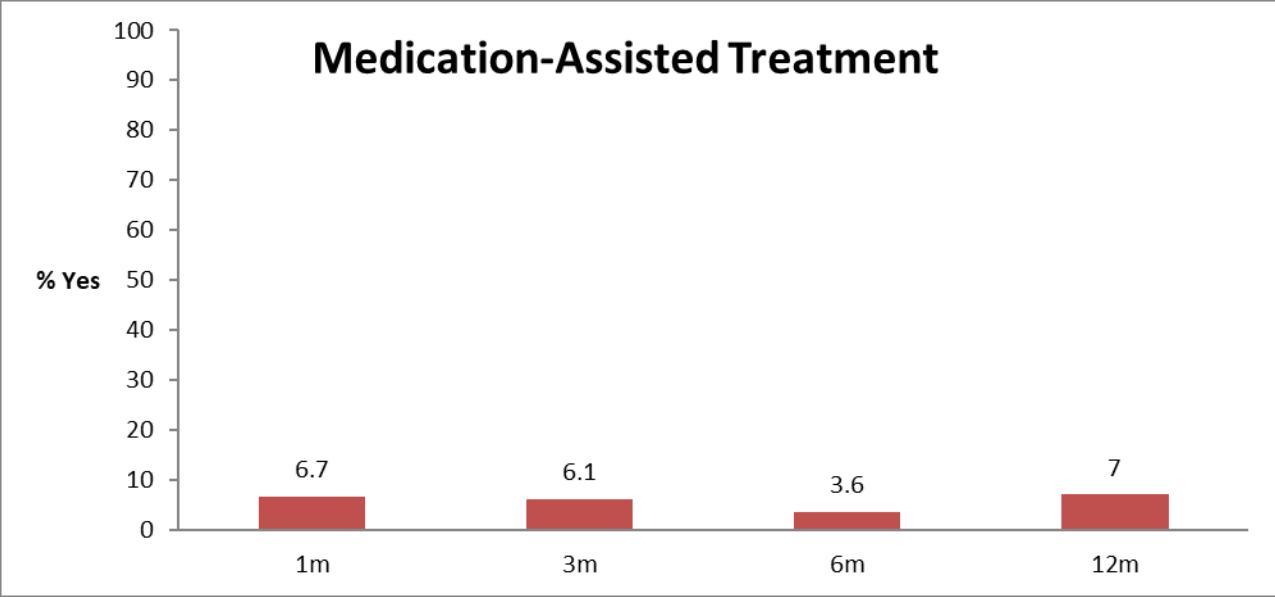


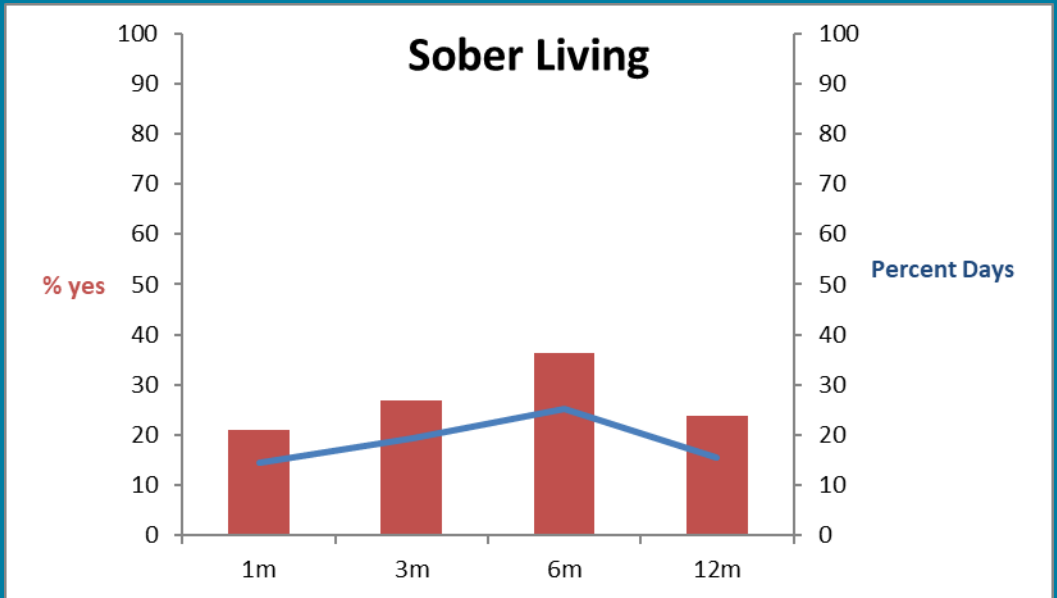


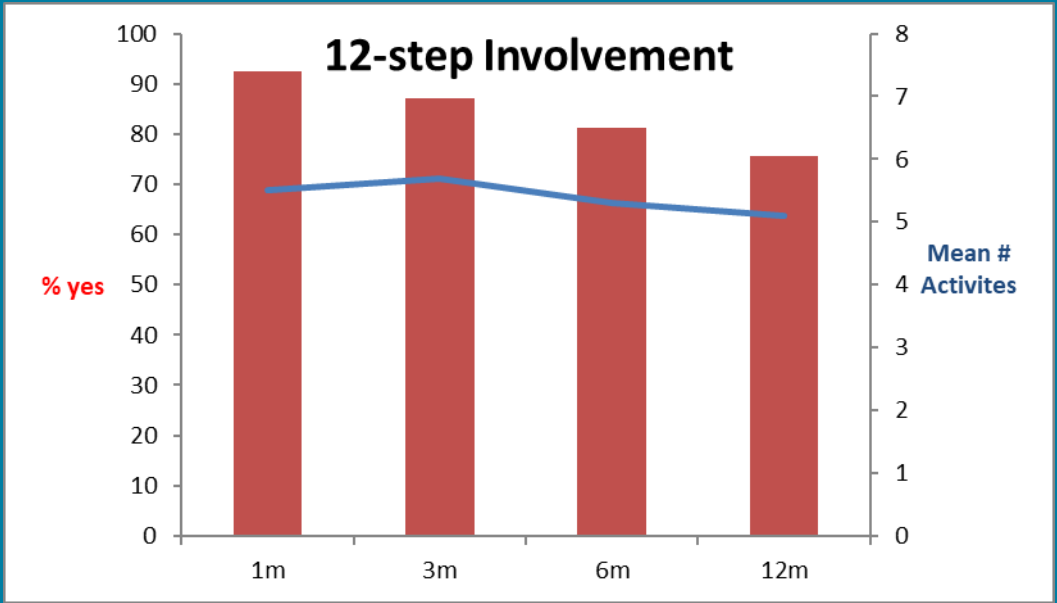


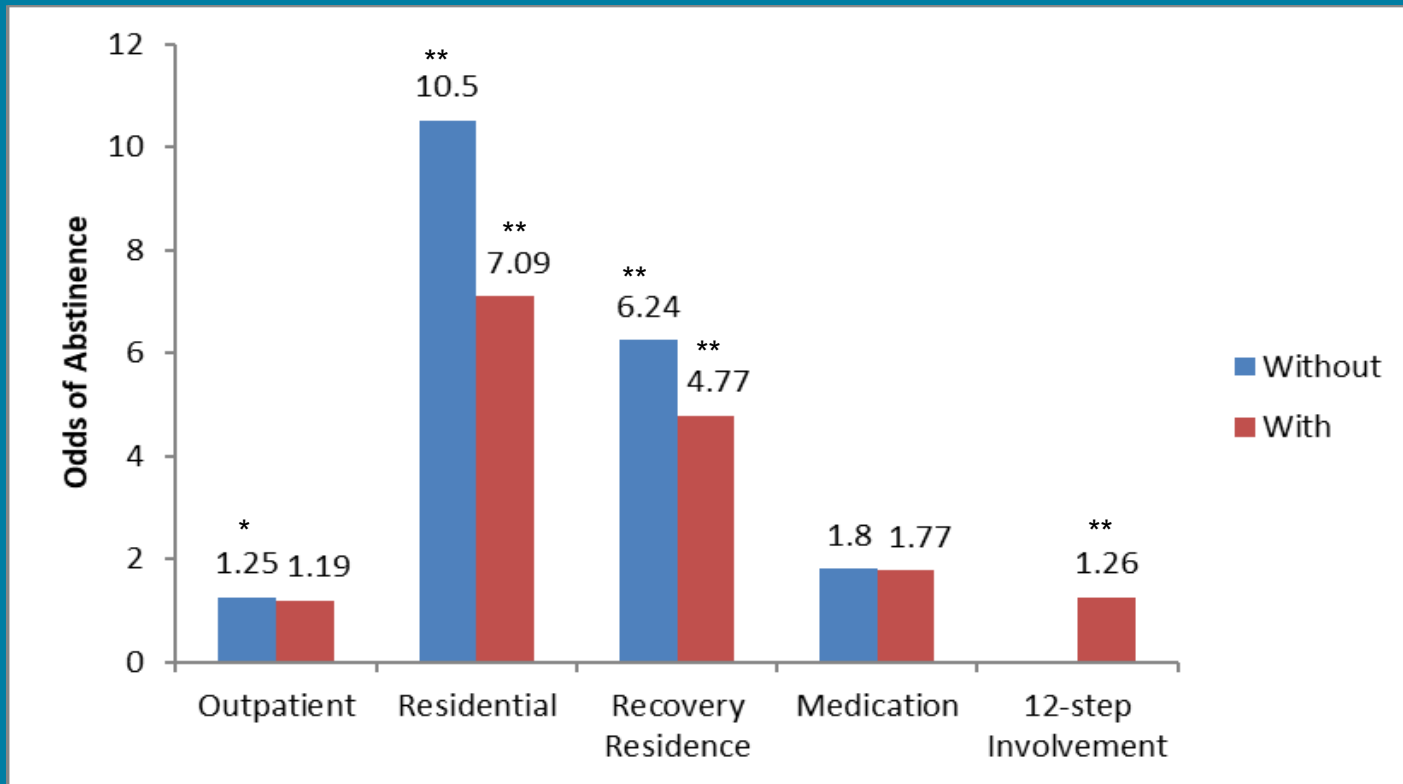












\*  $p < .05$ ; \*\*  $p < .01$

e.g., Odds of abstinence 4.77 times greater if living in a recovery residence 100% of days for a follow-up period

e.g., Odds of abstinence 1.26 times greater if involved in one 12-step activity compared to none, 1.59 for two...3.2 times greater for five (lowest M involvement score across follow-ups)



# Exploratory Interactions with Time

- Residential treatment and 12-step MHO active involvement interactions significant
- Conducted exploratory analyses at each follow-up assessment
- Effects of residential treatment on abstinence got weaker over time, and was not significant at 12m follow-up (OR = 0.70)
  - “Meaning” of being in further residential treatment changes across the first year after an index episode
- 12-step involvement on abstinence got stronger over time (ORs = 1.25, 1.04 [ns], 1.43, 1.61)





# Summary Study 3

- Further residential common, lessened over time, while recovery residence and 12-step involvement fairly stable
- Outpatient and medication less common in this sample
- Residing in a structured, recovery-supportive environment helps increase odds of abstinence
- 12-step involvement confers unique benefit, and may explain some benefit associated with these structured environments



# Clinical Implications and Future Directions

- Consider referral to structured programs post-treatment that actively link emerging adults to 12-step MHOs
  - Young adult meetings may be considered to enhance initial engagement (Labbe et al. 2014)
- Studies needed that evaluate and compare services offered at recovery residences (e.g., drug testing, counseling, mandatory employment/school)
- Other continuing care studies needed (“mental health” services, like psychotherapy and psychotropic medications)
- The landscape of medications for SUD has changed since 2006-2008; what are the naturalistic implications of this re: treatment and continuing care among emerging adults with SUD?



# Studies 1-3: A Recap

- COD emerging adults respond as well during residential treatment as SUD-only – PDA may begin to tail off as they approach the end of the post-treatment year
  - Psychiatric symptoms rapidly improve during treatment, remain stable, and respond similarly for COD and SUD-only
- 12-step MHO attendance, but especially active involvement, helps boost PDA, and may help buffer against COD poorer outcomes
- 12-step MHO active involvement effects hold up also when considering professional continuing care – associated benefits of which may be explained because these services help link individuals to these community based resources



# Limitations

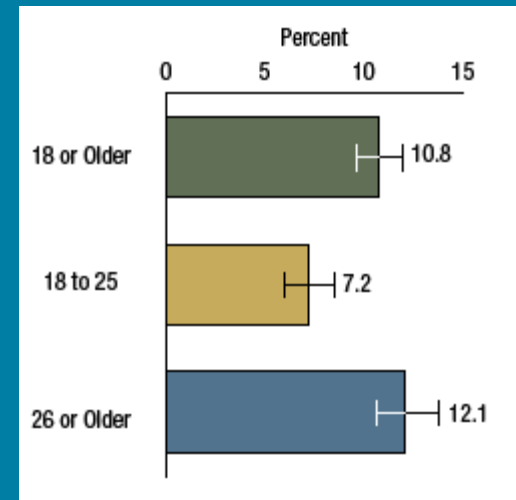
- External Validity Issues
  - e.g., Race/ethnicity
  - Program characteristics may not generalize
- Internal Validity Issues
  - Design (e.g., regression to the mean on psych symptoms)
  - Potential impact of unmeasured characteristics
- Measurement Issues
  - SCID-IV upon treatment intake
  - Active involvement scale



# Future Directions

- Psychiatric symptoms, COD, and SUD treatment/recovery
  - Role for neuroscience?
- Controlled trials examining integrated or layered treatment approaches vs. SUD-focused approaches in COD young adults
  - Residential vs. outpatient
- Engagement, engagement, engagement
  - Emerging adults are harder to engage in treatment, and when we do, harder to engage in post-treatment recovery support services
  - 96% who don't get it don't feel they need it
  - Paradigm shift: What *is* treatment?

Source: NSDUH 2016



## BRIEF REPORT

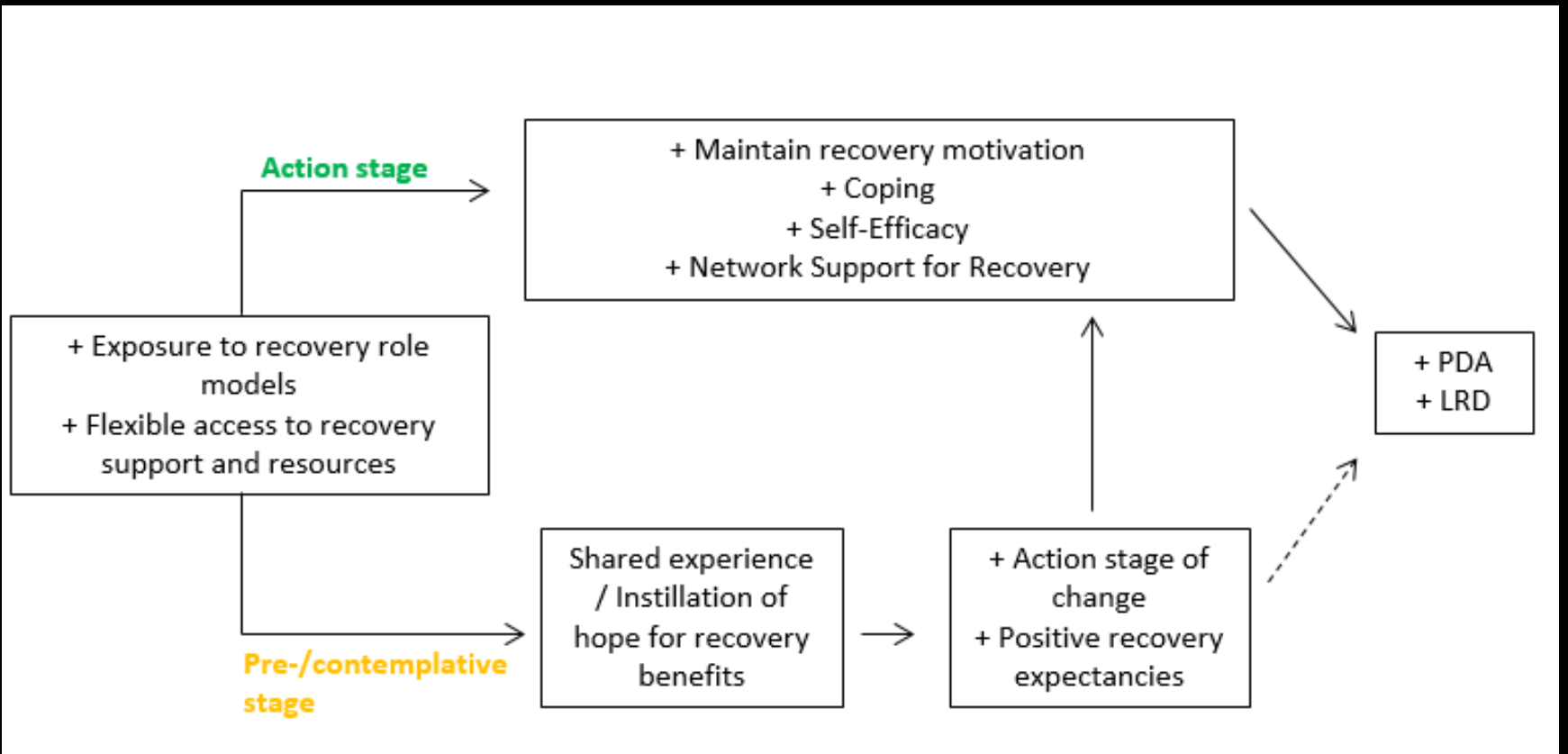
# Digital Recovery Management: Characterizing Recovery-Specific Social Network Site Participation and Perceived Benefit

Brandon G. Bergman, Nathaniel W. Kelly, Bettina B. Hoepfner, Corrie L. Vilsaint, and John F. Kelly  
Massachusetts General Hospital, Boston, Massachusetts, and Harvard Medical School

Research shows that digital social network sites (SNSs) may be valuable platforms to effect health behavior change. Little is known specifically about their ability to help address alcohol and other drug problems. This gap is noteworthy, given that individuals are already participating in existing, recovery-specific SNSs (hereafter referred to as *recovery SNSs*): online communities with the functionality of conventional SNSs (e.g., Facebook) that focus on substance use disorder (SUD) recovery. For example, InTheRooms.com (ITR) is a large, well-known recovery SNS that is available for free 24 hr/day via website and mobile smartphone applications. It offers recovery tools within a digital social milieu for over 430,000 registered users. To augment the knowledge base on recovery SNS platforms, we conducted an online survey of 123 ITR participants ( $M = 50.8$  years old; 56.9% female; 93.5% White;  $M = 7.3$  years of abstinence, range of 0–30 years; 65% cited alcohol as their primary substance). Respondents engaged with ITR, on average, for about 30 min/day several times each week. Daily meditation prompts and live online video meetings were the most commonly utilized resources. Participants generally endorsed ITR as a helpful platform, particularly with respect to increased abstinence/recovery motivation and self-efficacy. Compared to individuals abstinent for 1 or more years, those abstinent less than 1 year (including nonabstinent individuals) showed similar rates of engagement with ITR activities and similar levels of perceived benefit. Our findings suggest that longitudinal studies are warranted to examine the clinical utility of ITR and other recovery SNSs as SUD treatment adjuncts and/or recovery self-management tools.

**Keywords:** e-health, social network sites, substance use disorder, mutual help organizations





# NIAAA K23 Under Review

**Goal:** To become an expert in scientific methodologies that capitalize on social network site (SNS) platforms to promote, and increase our understanding of, recovery-related behavior change among emerging adults with alcohol and other drug use disorders

- 1) To investigate the clinical utility of recovery social network sites for emerging adults with alcohol and other drug use disorders**
- 2) To assess the interplay between online and in-vivo network influences, and their effects on treatment outcomes**





# The RRI “Squad”





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