

Post-treatment 12-step involvement and 3-year outcomes among adolescents with substance use problems – *Social support and religiosity as mediators*

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Background

- 12-step participation is now widely utilized as a treatment aftercare resource by individuals with substance use (SU) problems
- Studies have found the effectiveness of 12-step involvement on post-treatment outcomes among adults
- However, little is known about the participation patterns and effectiveness of 12-step programs among adolescents

Background (Continued)

- Lack of understanding about the mechanism through which 12-step involvement leads to positive outcomes among adolescents
 - Adult literature suggested some possible mediating factors such as self-efficacy, motivation, coping, social networks, and spirituality
 - A study of 99 adolescent inpatients found modest beneficial effects of 12-step attendance, which were mediated by motivation but not by coping or self-efficacy (Kelly et al, 2000)
 - No studies have examined mediating effects of social support and religiosity on the association between 12-step involvement and SU outcomes among adolescents with SU problems

Research Questions

- What are the patterns of 12-step involvement at 3-year follow-up for adolescents with SU problems?
- Does 12-step involvement lead to positive SU outcomes at 3-year follow-up?
- Are social support and religiosity acting as mediators in the relationship between 12-step involvement and SU outcomes at 3-year follow-up?

Methods

- Study Sites: 4 Northern CA Kaiser Permanente (KP) Chemical Dependency (CD) programs
- Study Subjects: 357 adolescent CD intake who completed both baseline and 3-year follow-up interviews

Measures

- SU outcomes: 30-day abstinence from alcohol and drug
- 12-step involvement: 8 questions from the Alcoholics Anonymous Affiliation Scale (Humphreys et al, 1998)
 - Distinction between “meeting attendance” and “activity involvement” (Kelly et al, 2002)
- Social support: # family members and friends actively supporting reducing use
- Religiosity: religious service attendance

Measures (Continued)

■ Control variables:

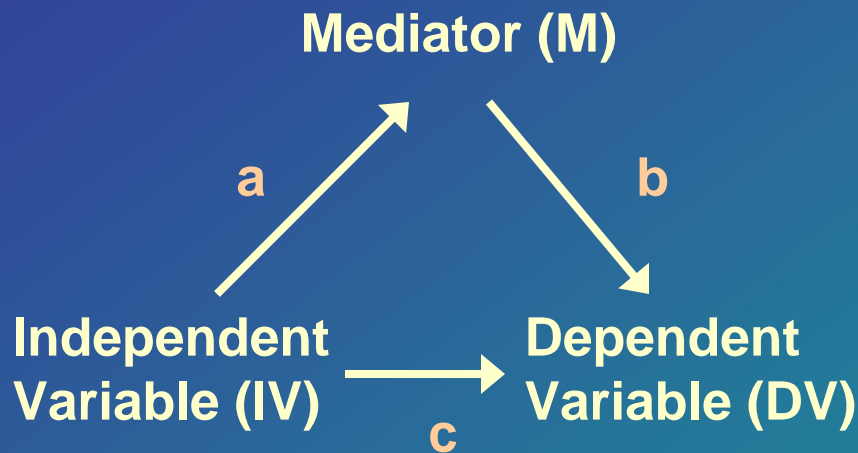
– Individual characteristics:

- demographics (age, gender, race/ethnicity)
- baseline SU severity
- baseline mental health (MH) severity
- baseline motivation (CMR total score)

– Treatment characteristics:

- length of stay for the index CD treatment
- MH services received during index CD treatment
- CD and MH services received during the second and the third follow-up years, either within or outside the health plan

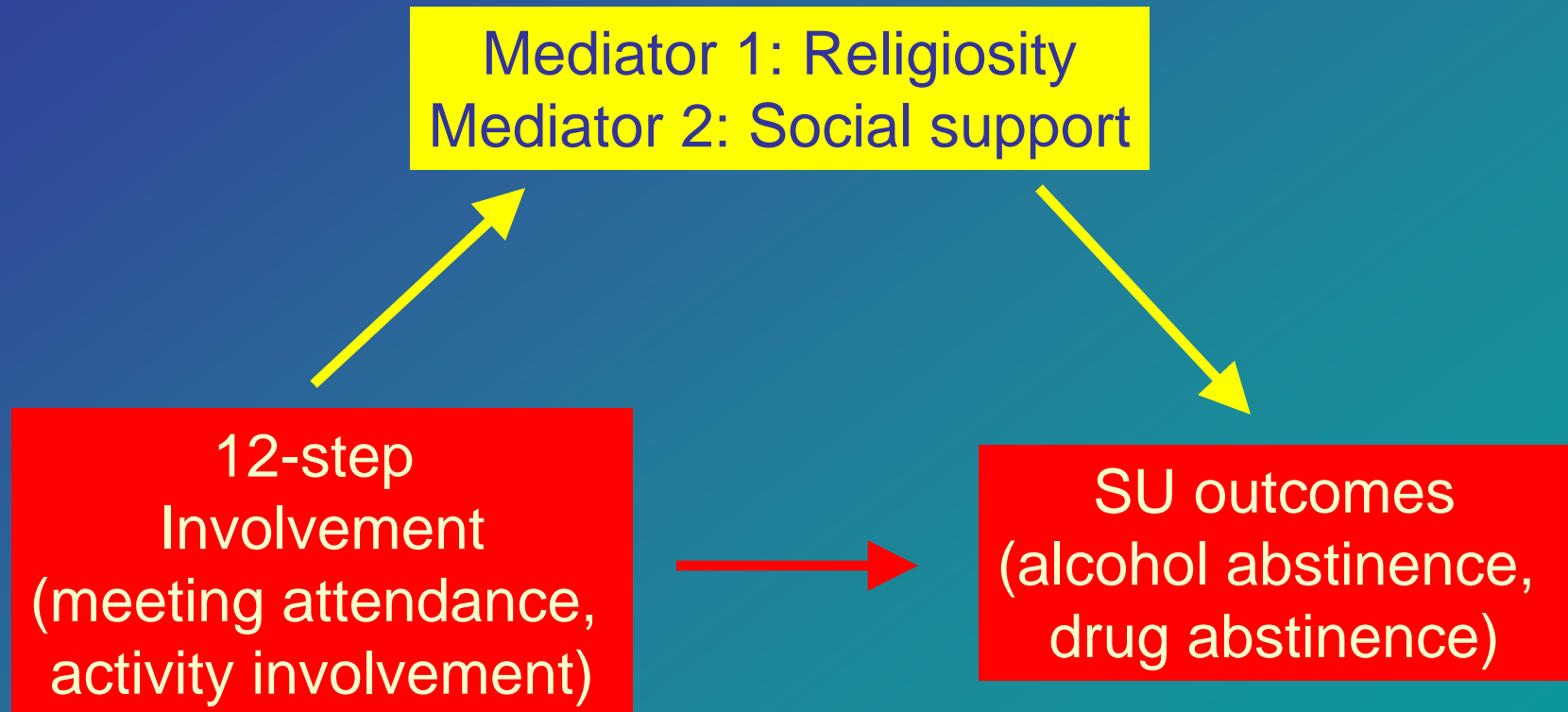
Examining Mediator Effects



- a) Variations in levels of IV significantly account for variations in the mediator
- b) Variations in the mediator significantly account for variations in DV
- c) When path a and b are controlled, the mediator significantly decreases path c

Source: Baron RM, Kenny DA (1986) The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol* 51: 1173-1182.

Conceptual Model



Statistical Analysis

- A series of 4 multivariate logistic regression models was estimated for each outcome variable:

Model 1 – 12-step involvement as main IV

Model 2 – Adding religiosity (M1)

Model 3 – Adding social support (M2)

Model 4 – Adding both religiosity and social support

*All models controlled for demographics, baseline severity, baseline motivation, and CD/MH treatment received

- The extent of mediation was estimated as the percent change in the effect of 12-step:

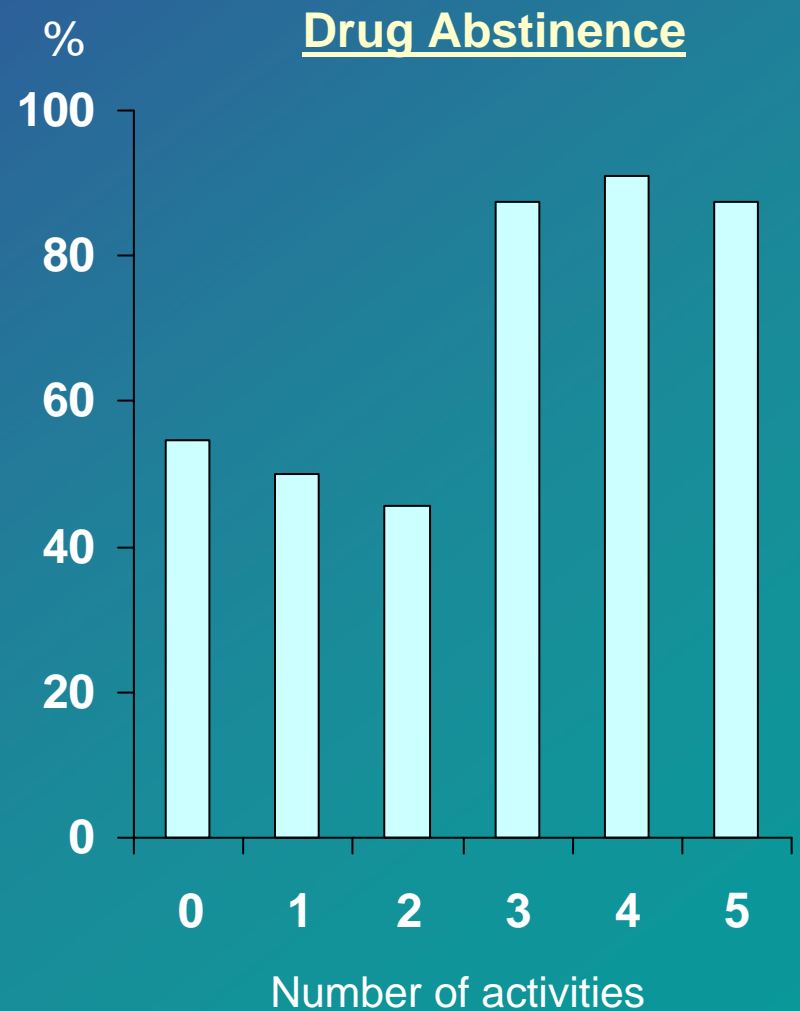
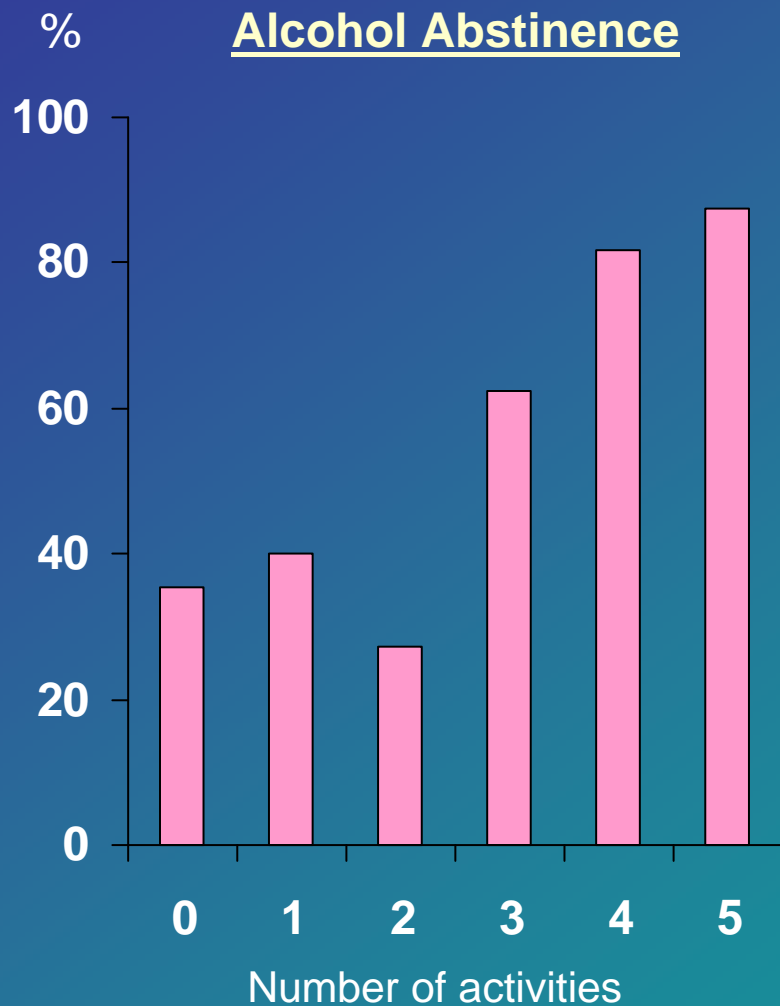
$$\% \text{ change in effect} = 100 \times \frac{(OR_{M-} - OR_{M+})}{(OR_{M-} - 1)}$$

SU Outcomes by Involvement of 12-step Activities in Past 6 Months (N=357)

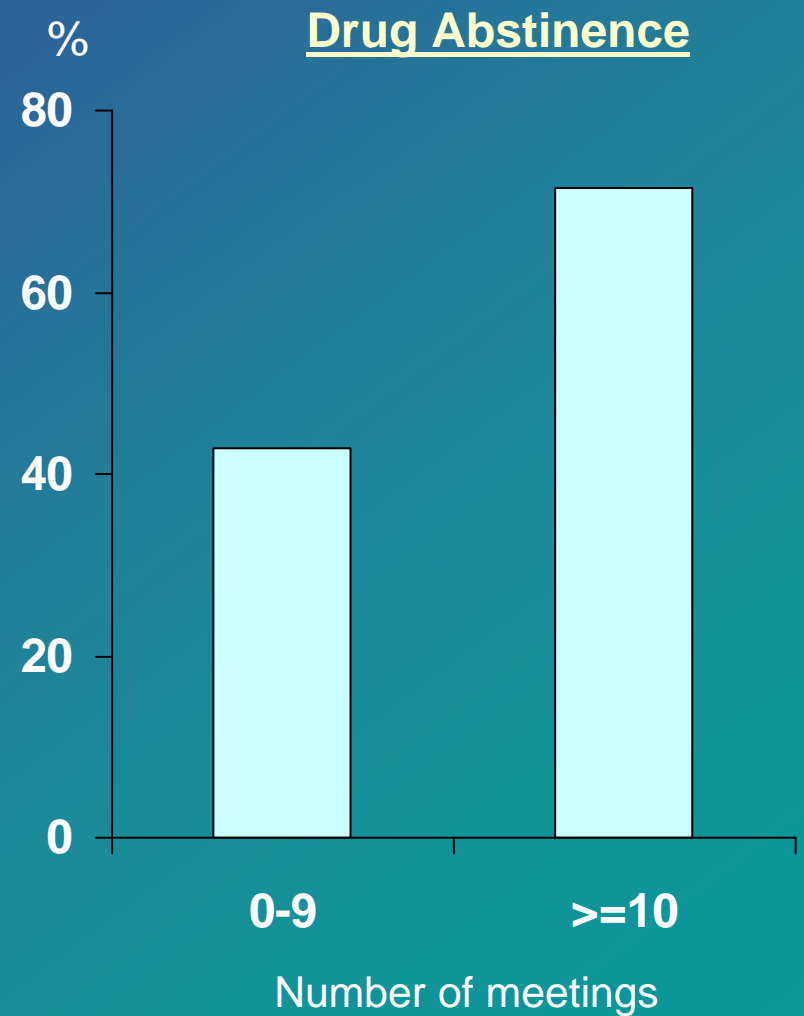
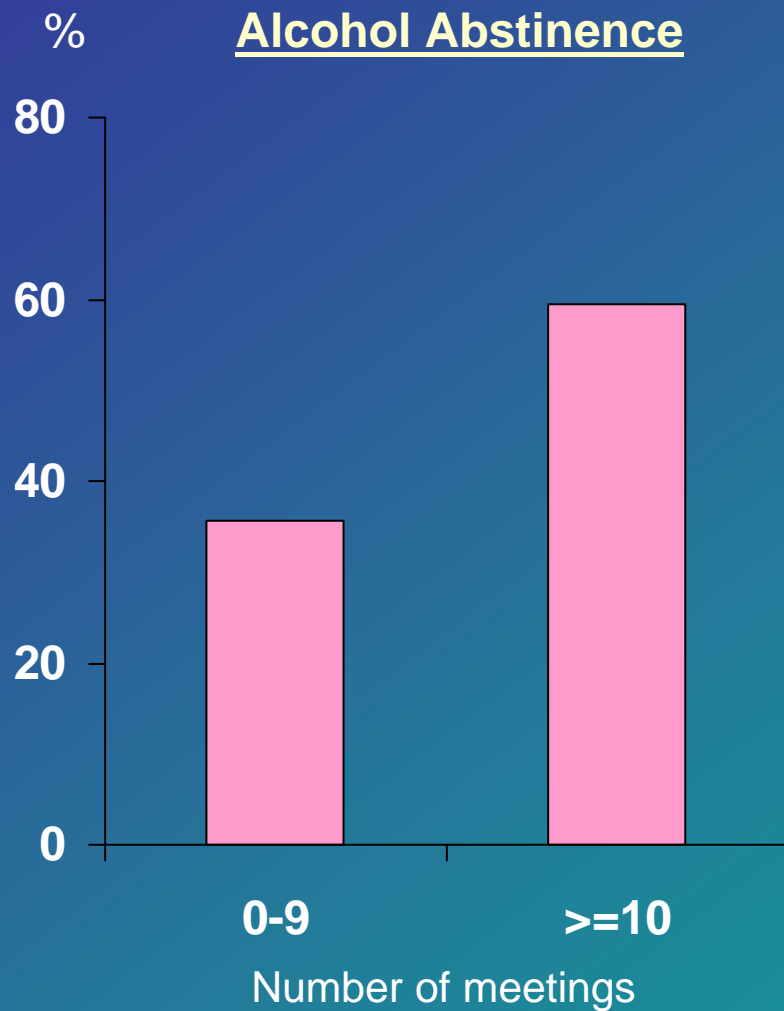
			Alcohol				Drug
			Abstinence (%)				Abstinence (%)
Considered a member	No	(n=329)	35.3	‡	54.4	†	
	Yes	(n=28)	75.0		85.7		
Called for help	No	(n=333)	36.0	‡	54.7	†	
	Yes	(n=24)	70.8		87.5		
Have a sponsor	No	(n=342)	36.8	†	55.6	**	
	Yes	(n=15)	73.3		86.7		
Read literature	No	(n=311)	35.4	†	55.0	*	
	Yes	(n=46)	58.7		69.6		
Did service	No	(n=330)	35.5	‡	55.2	**	
	Yes	(n=27)	74.1		77.8		

* p<0.10; ** p<0.05; † p<0.01; ‡ p<0.001.

SU Outcomes by Number of 12-step Activities Involved in Past 6 Months (N=357)



SU Outcomes by Number of 12-step Meetings Attended in Past 6 Months (N=357)



Associations between Religiosity (M1) and 12-step Involvement (IV) and SU Outcomes (DV)

		Religious services Attendance (%)			P value
		Never	<1/mo~ 1-2/mo	Weekly	
No. of 12-step activities involved in past 6 months	0-2	47.0	45.8	7.3	0.0217
	3-5	33.3	44.4	22.2	
No. of 12-step meetings attended in past 6 months	0-9	48.6	44.4	7.0	0.0035
	>=10	26.2	54.8	19.1	
Abstinence from alcohol in past 30 days	No	49.1	44.6	6.4	N.S.
	Yes	40.9	47.5	11.7	
Abstinence from drug in past 30 days	No	57.1	38.3	4.6	0.0005
	Yes	37.4	51.2	11.3	

Associations between Social Support (M2) and 12-step Involvement (IV) and SU Outcomes (DV)

		No. of family members/friends support to quit	
		Mean	P value
No. of 12-step activities involved in past 6 months	0-2	5.2	0.0002
	3-5	9.4	
No. of 12-step meetings attended in past 6 months	0-9	5.2	0.0003
	>=10	8.3	
Abstinence from alcohol in past 30 days	Yes	4.0	<0.0001
	No	8.0	
Abstinence from drug in past 30 days	Yes	3.6	<0.0001
	No	7.0	

12-step Meeting Attendance vs. Alcohol Abstinence at 3 Years

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
12-step meetings attended				
10+ vs. 0-9	2.87 (1.38,5.99)**	2.69 (1.27,5.68)**	2.37 (1.10,5.10)*	2.28 (1.04,4.98)*
Religious service attendance				
Never vs. Weekly	-	N.S.	-	N.S.
<1/mo ~ 1-2/mo vs. Weekly	-	N.S.	-	N.S.
No. fam./friends support to quit	-	-	1.09 (1.05,1.13)†	1.09 (1.05,1.13)†
% Change in 12-step effects	-	9.6%	26.7%	31.6%

Note 1: * p<0.05; ** p<0.01; † p<0.0001.

Note 2: Multivariate logistic regression models controlled for age, gender, race/ethnicity, baseline SU and MH severity, baseline motivation, and CD/MH treatment received during the 1st, 2nd, and 3rd years after intake.

12-step Meeting Attendance vs. Drug Abstinence at 3 Years

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
12-step meetings attended				
10+ vs. 0-9	2.44 (1.10,5.43)*	1.91 (0.84,4.33)	2.02 (0.89,4.59)	1.59 (0.68,3.66)
Religious service attendance				
Never vs. Weekly	-	0.33 (0.13,0.87)**	-	0.33 (0.12,0.89)*
<1/mo ~ 1-2/mo vs. Weekly	-	0.65 (0.25,1.70)	-	0.61 (0.22,1.65)
No. fam./friends support to quit	-	-	1.09 (1.04,1.13)†	1.09 (1.04,1.13)†
% Change in 12-step effects	-	36.8%	29.2%	59.0%

Note 1: * p<0.05; ** p<0.01; † p<0.001.

Note 2: Multivariate logistic regression models controlled for age, gender, race/ethnicity, baseline SU and MH severity, baseline motivation, and CD/MH treatment received during the 1st, 2nd, and 3rd years after intake.

12-step Activity Involvement vs. Alcohol Abstinence at 3 Years

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
12-step activities involved				
3+ vs. 0-2	7.24 (2.53,20.67)**	6.88 (2.40,19.71)**	5.85 (1.95,17.54)*	5.68 (1.88,17.19)*
Religious service attendance				
Never vs. Weekly	-	N.S.	-	N.S.
<1/mo ~ 1-2/mo vs. Weekly	-	N.S.	-	N.S.
No. fam./friends support to quit	-	-	1.09 (1.05,1.13)†	1.09 (1.05,1.13)†
% Change in 12-step effects	-	5.8%	22.3%	25.0%

Note 1: * p<0.01; ** p<0.001; † p<0.0001.

Note 2: Multivariate logistic regression models controlled for age, gender, race/ethnicity, baseline SU and MH severity, baseline motivation, and CD/MH treatment received during the 1st, 2nd, and 3rd years after intake.

12-step Activity Involvement vs. Drug Abstinence at 3 Years

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
12-step activities involved				
3+ vs. 0-2	8.75(2.33,32.94)**	7.36(1.95,27.76)**	7.23(1.84,28.45)**	5.93(1.51,23.28)*
Religious service attendance				
Never vs. Weekly	-	0.34 (0.13,0.91)**	-	0.35 (0.13,0.98)*
<1/mo ~ 1-2/mo vs. Weekly	-	0.68 (0.26,1.82)	-	0.66 (0.24,1.83)
No. fam./friends support to quit	-	-	1.08 (1.04,1.13)†	1.08 (1.04,1.13)†
% Change in 12-step effects	-	17.9%	19.6%	36.4%

Note 1: * p<0.05; ** p<0.01; † p<0.001.

Note 2: Multivariate logistic regression models controlled for age, gender, race/ethnicity, baseline SU and MH severity, baseline motivation, and CD/MH treatment received during the 1st, 2nd, and 3rd years after intake.

Summary

- At 3 years, low post-treatment 12-step involvement in the past 6 months among adolescents with SU problems
 - 19% attended any meetings (12% 10+ meetings)
 - 14% involved at least 1 of the 5 activities
- Reasons for low involvement?
 - Compared to adults, adolescents were less likely to express a preference for spirituality and 12-step oriented approaches (Aromin RA et al, 2006)
 - 90% of our sample reported that typical age of the group members in their group as 18+; 10% 16-18

Summary (Continued)

- 12-step involvement significantly associated with SU outcomes at 3 years
 - Minimum level for significant benefits?
 - For those who attended 10+ meetings, the odds of being alcohol abstinent were almost 3 times, and the odds of being drug abstinent were almost 2 and half times, as high as for those who attended fewer or none
 - Similarly, for those who involved 3+ activities, the odds of being alcohol abstinent were 7 times, and the odds of being drug abstinent were almost 9 times, as high as for those who involved fewer or none

Summary (Continued)

- Mediating effects of social support for both alcohol and drug abstinence
 - 22-27% of 12-step effects on alcohol abstinence
 - 20-29% of 12-step effects on drug abstinence
 - Similar to adult literature
- Mediating effects for religiosity only for drug outcomes
 - 18-37% of 12-step effects on drug abstinence

Conclusions

- 12-step involvement plays an important role in long-term recovery for adolescents with SU problems
- Social support and religiosity as two possible mechanisms through which 12-step works, especially for drug abstinence
- Some other mechanisms account for the associations between 12-step involvement and alcohol abstinence

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