Published in final edited form as:

Subst Abus. 2015 ; 36(4): 453–461. doi:10.1080/08897077.2014.960550.

Religiosity as a Predictor of Adolescents' Substance Use Disorder Treatment Outcomes

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Abstract

Background—A growing body of research on adults with substance use disorders (SUD) suggests that higher levels of religiosity and/or spirituality are associated with better treatment outcomes. However, investigation into the role of religiosity and spirituality in adolescent SUD treatment response remains scarce. The present study examines religiosity as a predictor of treatment outcomes in an adolescent sample, with alcohol/other drug problem recognition as a hypothesized moderator of this relationship. Problem recognition was selected as a moderator in an attempt to identify a subset of adolescents who would be more likely to use religious resources when attempting to change their substance use.

Methods—127 outpatient adolescents age 14 to 19 (M age = 16.7, SD = 1.2, 24% female) were followed for 1 year after treatment intake. Growth curve analyses were used to assess the impact of baseline religiosity and problem recognition on subsequent abstinence rates, drug-related consequences, and psychological distress.

Results—On average, abstinence did not change significantly during the follow-up period, whereas drug-related consequences and psychological distress decreased significantly. Religiosity did not predict changes in abstinence or psychological distress over time. Religiosity did predict reductions in drug-related consequences over time ($b = -0.20$, $t = -2.18$, $p = .03$). However, when problem recognition was added to the model, the impact of religiosity on consequences became non-significant and there was no interaction between religiosity and problem recognition on consequences.

Conclusions—The main hypothesis was largely unsupported. Possible explanations include that the sample was low in religiosity and few participants were actively seeking sobriety at treatment intake. Findings suggest adolescent outpatients with SUD may differ from their adult counterparts in the role that religiosity plays in recovery.

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Author Contribution: All authors contributed to the conceptualization of the study presented in this paper. Ms. Yeterian managed the literature searches and summaries of previous related work, conducted the data analyses and interpreted the results, and wrote the first draft of the manuscript. Drs. Bursik and Kelly provided substantive feedback on drafts of the manuscript. Ms. Yeterian managed the revisions to the article, with input from Drs. Bursik and Kelly. Dr. Kelly designed and conducted the original study from which data are drawn.

Introduction

Religiosity and spirituality have long been emphasized in the process of recovery from addictions¹ and, more recently, the role of religiosity and spirituality in addiction recovery has been investigated scientifically.² While these constructs are related, there are also key distinctions.² Religion represents a socially-organized system of beliefs and practices that can be measured with concrete questions, such as identification with a particular religious group, frequency of participation in religious services, and belief in a higher power(s).³ Spirituality, in contrast, is personally defined and has multiple ways of being conceptualized.⁴ The term “spirituality” is often used to represent one's sense of meaning or purpose in life, a general sense of well-being, and recognition of and connection to a power or force greater than oneself. Religion is one method of cultivating spirituality, but it is possible for individuals to develop spiritually without participating in formal religious practices or following a religious code of beliefs.^{4,5}

Researchers have theorized that religiosity and spirituality can support recovery from substance use disorders (SUD) through providing individuals with a sense of purpose, meaning, or connection to core values, stimulating positive cognitive and affective changes, and increasing social support through participation in culturally-sanctioned systems of meaning.^{3,5,6} Spirituality is seen by the Alcoholics Anonymous program as the primary mechanism through which recovery occurs (i.e., “spiritual awakening”).⁷

The majority of studies on the role of religiosity and spirituality in addiction recovery find that improved substance use outcomes (e.g., higher rates of abstinence) are predicted by higher levels of spirituality^{8,9,10,11} or religiosity,^{12,13,14,15,16,17} or by an increasing level of religiosity or spirituality over time.^{18,19} However, the bulk of this research has used adult samples. Little is known about the relevance of religiosity and spirituality to individuals who are in the early phases of addiction or making their first attempts to stop using, such as adolescents.

Most of the adolescent research in this area has focused on the protective function that religiosity appears to serve against the onset of substance use and the development of SUD in youth, with spirituality, on its own, being studied less frequently.^{20,21,22} Less is known about adolescents who actually develop SUD: can religiosity support their recovery as it appears to do for adults?

The limited research in adolescent samples has produced mixed findings. One study that followed adolescents for 3 years after outpatient treatment found that the frequency of religious service attendance at year 3 was positively associated with past 30-day abstinence from drugs, but not alcohol, at year 3.²³ Two longitudinal studies using a residential treatment sample have produced similarly mixed findings. Using the full sample of 195 adolescents, Kelly and colleagues²⁴ examined two dimensions (formal religious practices, God consciousness) of the lifetime subscale of the Religious Background and Behavior (RBB) scale²⁵ as predictors of change during treatment. They found that while lifetime religious practices at intake predicted five of the seven outcome variables (e.g., fewer positive urine toxicology screens during treatment, decreased cravings), God consciousness

did not predict any of the outcomes. Using only the Black and White adolescents ($n = 165$) from the same sample, Krentzman and colleagues²⁶ found that baseline religiosity, as measured by the full RBB, predicted 12-step helping and 12-step work during treatment, but had no relation to the likelihood of having a positive urine toxicology screen or to self-reported cravings during treatment. The apparent contradiction between the two studies in the urine toxicology and cravings outcomes underscores the tenuousness of the conclusions that can be drawn. The existing adolescent research is also limited by correlational designs or, when longitudinal, a lack of post-treatment follow-up.

It is possible that the relation between religiosity and treatment outcomes only holds for certain adolescents, such as those who see their substance use as problematic. Believing that one has a problem with alcohol or other drugs has been found to be related to greater involvement in spiritually-oriented 12-step meetings among adolescents²⁷ and higher religious service attendance among adults.²⁸ Individuals who recognize a substance problem may be at a more advanced stage of SUD than those who do not. Problem recognition has been found to be positively correlated with poly-drug use,^{28,29} days of recent drug use,²⁹ frequency of injection drug use,³⁰ perceived benefit of treatment and mutual-help participation,^{28,29} therapeutic alliance,³¹ treatment retention,³² and older age.³³ We theorize that the positive relation between higher religiosity and improved outcomes is more likely to be observed among adolescents who believe their substance use is problematic than those who do not, as these adolescents may be more religious and at a more advanced stage of SUD where they are actually attempting to change their substance use.

The present study extends the adolescent SUD literature on the role of religiosity by (a) examining outcomes longitudinally over a longer period of time than has previously been examined, (b) using a standard outpatient sample, which has been studied less frequently, but is the most common type of adolescent SUD treatment,³⁴ and (c) examining a potential moderator of the relationship between religiosity and outcomes. It is hypothesized that baseline religiosity will predict better substance use outcomes (i.e., greater abstinence, fewer substance-related consequences) and mental health outcomes (i.e., less psychological distress) over a 12-month period for adolescents who believe they have an alcohol/other drug problem. It is hypothesized that this relationship will be weaker for individuals who do not recognize an alcohol/other drug problem, as they may be at an earlier stage of addiction where their outcomes are not impacted by their religious beliefs and practices.

Methods

Participants and Treatment Facility

Participants were 127 adolescents (see Table 1 for descriptive information) who presented for treatment at a private, suburban, outpatient SUD treatment facility in the Northeastern U.S. between 2006 and 2009. Participants came from a mix of urban and suburban communities. No data were collected on socioeconomic status. The director of the treatment facility completed the Drug and Alcohol Program Treatment Inventory (DAPTI),³⁵ an 80-item survey designed to assess the goals and activities of an SUD treatment program across eight theoretical orientations. This measure showed that the treatment had a strong

cognitive-behavioral orientation and was not 12-step oriented. Thus, it is unlikely that treatment had an overtly religious or spiritual focus.

Procedure

Participants were assessed at treatment intake and 3, 6, and 12 months after intake. Follow-up rates were 91.3%, 84.3%, and 87.4%, respectively. Assessments included interview and self-report measures. Participants were paid \$40-50 for each assessment. Parents of minor participants were required to give consent for their adolescent's participation and adolescents were asked separately to provide assent to participate. Participants were informed that all information provided was confidential (except in the event of threats of imminent harm to self or others or in child abuse cases). Participants were also informed that their information was protected by a Certificate of Confidentiality issued by the National Institutes of Health, which protected their identifying information from compulsory legal disclosures. The study was conducted in compliance with the requirements of the Partners Human Research Committee.

Measures

Religiosity—Participants completed the Religious Background and Behavior (RBB) scale²⁵ at baseline, a 13-item self-report measure of religious beliefs and related practices for lifetime and past year timeframes. The present study uses the past year subscale in order to capture participants' current/recent level of religiosity. This includes the first item, where participants select the category that best describes them (atheist, agnostic, unsure, spiritual, or religious) and the six past year items, where participants rate how often they have engaged in six religious activities (i.e., “thought about God,” “prayed,” “meditated,” “attended worship services,” “read-studied scriptures, holy writings,” “had direct experiences of God”) in the past year on a scale from 1 (never) to 7 (more than once a day).

Following Connors and colleagues,²⁵ raw RBB scores were recoded to establish a scoring floor of 0. The past year score was calculated by taking the mean of the items to which the participant responded and multiplying by the total number of items (range: 0-47). Higher scores represent higher levels of religiosity. Internal consistency was acceptable ($\alpha = .76$).

Problem recognition—At baseline, participants separately indicated whether they believed they had a problem with alcohol and/or other drugs, either currently or in the past. The meaning of “problem” was not defined for participants. Just over 20% of the sample recognized having a problem with alcohol currently or in the past, whereas 53% stated that they had or have a problem with other drugs. These responses were combined into a single variable representing recognition of a past or current problem (yes vs. no), with 60.6% recognizing a problem and 39.4% not recognizing a problem.

Substance use—At each timepoint, the Timeline Follow Back (TLFB)³⁶ and Form-90³⁷ were used to examine substance use frequency and timing. These measures are completed as interviews, wherein the interviewer helps the participant to recall their substance use over the past 90 (or 180) days, using a calendar to cue participants in to key dates (e.g., holidays, school vacations). These measures are used to calculate one of the main outcome variables:

percent days abstinent (PDA), or the percentage of days during the past 3 or 6 months on which the participant did not use any drugs or alcohol.

Drug- and alcohol-related consequences—At all timepoints, participants completed the Inventory of Drug Use Consequences-Recent (InDUC-2R),³⁸ a 45-item self-report measure of recent consequences of alcohol/other drug use. Participants rate how often each item happened to them in the past 90 or 180 days on a scale of 0 (never or N/A) to 3 (daily or almost daily). The total score was calculated by computing the mean of the items to which the participant responded and multiplying by the total number of items (range: 0-135), with higher scores representing more consequences. Internal consistency was high across timepoints ($\alpha = .94-.96$).

Psychological distress—Participants completed the Brief Symptom Inventory (BSI)³⁹ at all timepoints, a 53-item self-report measure of the distress caused by psychological symptoms in the past week. Participants rate their degree of distress on a scale from 0 (not at all) to 4 (extremely). The total score, the Global Severity Index (GSI), is the average of all items and can range from 0 to 4, with higher scores indicating greater psychological distress. Internal consistency was high across timepoints ($\alpha = .96-.97$).

Predictors of Attrition

At each follow-up, participants who did not complete the assessment were compared to successfully followed cases on baseline demographic (age, gender, race) and clinical variables (PDA, substance-related consequences, presence of a comorbid Axis-I condition) using independent samples t-tests and Chi-square analyses. There were no significant differences detected at the 3- or 6-month follow-ups ($ps > .06$). However, non-Whites were less likely to complete the 12-month follow-up than Whites ($\chi^2(1, N = 127) = 5.04, p = .04$). There were no further differences at the 12-month follow-up ($ps > .06$).

Analysis Plan

After examining descriptive information, growth curve analyses in a multilevel regression framework were used to examine the impact of baseline religiosity and its interaction with baseline problem recognition on outcomes over time using a repeated measures design.^{40,41} Growth curve analyses carry several advantages over traditional statistical approaches, including allowing for outcomes to be correlated across timepoints, not excluding participants who missed one or more follow-ups, allowing for uneven spacing of observations, and permitting an examination of intra- and inter-individual differences in change patterns over time.⁴¹ Analyses were conducted using IBM SPSS Statistics version 21.

Results

Preliminary and Descriptive Analyses

Table 2 shows the descriptive information for the main predictor (RBB) and outcome variables (PDA, InDUC-2R, GSI) over time. On average, participants were using substances on more than half the days at baseline. Abstinence (PDA) then increased by month 3, but

returned to the baseline level by the end of the follow-up period. The other two outcome variables, drug-related consequences (InDUC-2R) and psychological distress (GSI), decreased during the first 3 months of the study and remained low. There was a great deal of variability in the predictor and outcome variables at all timepoints.

Table 3 shows the baseline bivariate correlations between the predictor and outcome variables. Religiosity was not correlated with abstinence or psychological distress at baseline, but was positively related to drug-related consequences, such that people who were more religious also reported more consequences. Interestingly, abstinence rate was not correlated with either drug-related consequences or psychological distress, but consequences and psychological distress were positively correlated, such that people who reported more drug-related consequences also reported more psychological distress.

Table 4 compares problem recognition groups (yes vs. no) on age, gender, and baseline levels of the predictor and outcome variables. Problem recognition groups did not differ in age, gender (% female), or abstinence. However, problem recognizers were more religious than those who did not believe they had an alcohol/other drug problem, which lends initial support to the idea that religiosity may be more important for those who believe they have an alcohol/other drug problem. Problem recognizers also reported more drug-related consequences than problem non-recognizers. Similarly, problem recognizers reported experiencing more psychological distress in the past week than problem non-recognizers.

Unconditional Growth Curve Models

Before examining whether religiosity and/or problem recognition predicted the outcome variables, unconditional growth curve models (i.e., models of change in the outcomes over time with no predictors) were built to examine individual variations in growth rates for each outcome. Two unconditional models were built for each of the three variables, one which modeled time linearly and one which modeled both linear and quadratic (time squared) time. Deviance statistics (i.e., estimates of how well each model fits the data) were compared across models to determine how to best model time. For all three variables, the unconditional change model with both linear and quadratic time was a significantly better fit for the data than the model with linear time alone, suggesting that individual change trajectories were non-linear. Linear and quadratic time coefficients must be interpreted together, with linear coefficients providing information on the direction and magnitude of the linear slope at the intercept (time 0) and quadratic time coefficients indicating whether the rate of change accelerated or decelerated over time.

For PDA, the intercept, or average baseline PDA, was 46.49. The linear and quadratic slopes were non-significant, suggesting that, on average, PDA did not change significantly over time. For InDUC-2R scores, the intercept was 38.89. The linear and quadratic coefficients were both significant, indicating an initial decrease that attenuated over time. GSI scores showed a similar pattern. The intercept for GSI scores was 0.95 and the linear and quadratic coefficients were both significant, indicating an initial decrease that decelerated over time.

Religiosity and Problem Recognition as Predictors of Changes in Outcomes

Three sets of models were run to test the hypothesis that religiosity would predict changes in the outcome variables over time for individuals recognizing an alcohol/other drug problem. The first set of models examined baseline RBB score as a predictor of the initial status and change over time in each of the three outcome variables. The second set examined problem recognition as a predictor of initial status and change over time in each outcome. The third set included three-way interactions between religiosity, problem recognition, and time on the outcomes. RBB score was grand mean centered before creating the interaction term to minimize colinearity. The grand mean centered RBB values were used in all models.

Abstinence—Religiosity did not predict linear or quadratic change in abstinence over time, nor was it associated with initial status of abstinence (see Table 5). Similarly, problem recognition group did not predict linear or quadratic change in abstinence or initial status. There was a significant interaction between religiosity and problem recognition on initial status of PDA, suggesting that religiosity was associated with greater abstinence for problem recognizers vs. non-problem-recognizers. However, there was no three-way interaction between RBB, problem recognition, and time on abstinence.

Drug-related consequences—Religiosity significantly predicted initial status in InDUC-2R score, as well as linear change in consequences over time, but not quadratic change over time (see Table 6 and Figure 1). Problem recognition was also a significant predictor of initial status in InDUC-2R score and significantly predicted both linear and quadratic change in consequences over time. However, when examining religiosity, problem recognition, and their interaction in the same model, only the effects of problem recognition remained significant. The effect of religiosity on initial status and linear change over time was reduced to non-significance. Furthermore, there was no three-way interaction between religiosity, problem recognition, and time on drug-related consequences.

Psychological distress—Religiosity did not predict linear or quadratic changes in psychological distress over time, nor was it associated with initial status of GSI (see Table 7). While problem recognition significantly predicted the initial status of GSI, it was not predictive of linear or quadratic change in psychological distress over time. Finally, there was no three-way interaction between religiosity, problem recognition, and time on psychological distress, either initially or over time.

Discussion

The main hypothesis, that baseline past-year religiosity would predict changes in treatment outcomes (abstinence rate, drug-related consequences, psychological distress) over a 1-year period for adolescents who recognized an alcohol/other drug problem was not supported. Religiosity predicted changes over time in just one of the three outcome variables (drug-related consequences), and this relationship became non-significant when the moderator (problem recognition) was added to the model. In addition, problem recognition did not appear to moderate the relation between religiosity and treatment outcomes over time. Problem recognition did interact with religiosity to predict baseline abstinence, such that

religiosity predicted greater abstinence for problem recognizers, but this interaction was not sustained across the follow-up period.

There are several possible explanations for these findings. First, the sample was not very religious. The mean past-year RBB score was 9.6 (SD = 7.0), which falls within the lowest decile of scores relative to the U.S. normative (adult) SUD sample.²⁵ Compared to other adolescents in SUD treatment, the current sample also appears low in religiosity. The mean total RBB score in Krentzman and colleagues'²⁶ sample (M = 28.6, SD = 14.4) was approximately double the mean of the full measure in the current sample, and there was a greater percentage of individuals who identified as religious or spiritual than in the current sample (72% vs. 42%). In the current sample, only 11% identified as religious at baseline, with 31% identifying as spiritual, 20% as atheist, 17% as agnostic, and 21% as unsure. The present sample contained a much higher proportion of atheists (individuals who identified themselves as "*Atheist [I do not believe in God]*" on question 1 of the RBB) than a nationally representative sample of 3,290 adolescents in the U.S., of whom only 3% reported they did not believe in God.⁴² While there was variability in religiosity within the current sample, the low level of religiosity overall could help explain why religiosity did not have a strong influence on the treatment outcomes of these adolescents.

In addition to being low in religiosity, the sample, generally speaking, was not seeking sobriety. At treatment intake, only 8% of the sample said their goal was to quit alcohol and other drugs. It may be the case that individuals who are attempting to quit using alcohol and other drugs are more likely to draw on religious resources to help them in this process than individuals who do not have a goal of abstinence, paralleling the finding that individuals with an abstinence goal are more likely to become involved in spiritually-oriented 12-step groups.^{43,44}

Limitations and Future Directions

This study involved a sample of adolescents in low-intensity outpatient treatment, who were, on average, low in religiosity and not aiming to abstain from substance use. We attempted to identify a subset of adolescents for whom religiosity had the potential to play a greater role in their treatment outcomes by examining problem recognition as a moderator. However, even though 60% of the sample saw their substance use (past or current) as problematic, the vast majority did not want to stop using. It may be more fruitful in future research to examine having an abstinence goal as a moderator, but this was not possible in the current sample due to the low number of adolescents with this goal.

This line of research is still in its infancy and, as such, future research should continue to examine the relation between religiosity, spirituality, and outcomes among adolescents with SUD. Qualitative research could provide information on whether and how adolescents perceive religion or spirituality to play a role in their substance use, helping to contextualize the inconsistent findings in the current literature. Researchers may also want to compare spirituality and religiosity as predictors, as some prior research with adults has found that spirituality, but not religiosity, predicts outcomes.^{8,10} Finally, it may be important to look at the change in religiosity or spirituality over time, rather than the baseline level of religiosity or spirituality, as this has been found to predict outcomes in adult samples.^{18,19}

Conclusions: Developmental Issues in Adolescent Recovery

The lack of findings in this study may represent a true difference between the factors that impact improvements in adolescents vs. adults with SUD, which has implications for treatment providers who must make choices about what to emphasize in treatment. There are important developmental differences between adolescents and adults with SUD that may explain why religiosity is a less consistent predictor of outcomes among adolescents than among adults. For example, adolescents in outpatient SUD treatment may be less severe in their addictions than their adult counterparts.^{45,46,47} Adolescents may be less motivated to stop using alcohol and/or drugs, as they often enter treatment as a result of external factors and rarely due to an intrinsic desire to stop using.^{48,49,50} Adolescent relapse appears to be predicted by different factors (i.e., substance use in social situations) than those that predict adult relapse (i.e., negative affect, interpersonal conflict).⁴⁵ Adolescents are also less likely than adults to attend 12-step meetings after treatment^{51,52} and are thereby less exposed to the 12-step model of spiritual growth as the path to recovery. Finally, adolescents in SUD treatment may simply be less spiritually oriented and have less religious involvement than their adult counterparts.⁵³ Taken together, these developmental differences suggest that religious processes may be less influential in adolescent outcomes, since religious processes may become increasingly relevant as individuals move into more advanced stages of addiction and recovery^{54,55} and since religiosity may be a direct buffer against negative affect and interpersonal conflict, but not against using drugs and alcohol “for fun” in social contexts.⁵

Acknowledgments

The authors would like to thank Michael Suvak, Ph.D., of Suffolk University for his assistance with data analysis. The authors declare no conflicts of interest.

Funding: Research reported in this document was supported by the National Institute on Drug Abuse of the National Institutes of Health under Award Number F31DA035030 and the National Institute on Alcohol Abuse and Alcoholism of the National Institutes of Health under Award Number R01AA015526. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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Figure.1.
Effect of religiosity on substance-related consequence over time.

Table 1
Baseline Demographics

	M (SD) or %
<i>Age</i>	16.7 (1.2)
Range	14-19
<i>Gender</i> (% male)	75.6
<i>Race</i> (%)	
White	86.6
Black	6.3
Asian	2.4
<i>Who do you live with?</i> (%)	
Biological parents	51.2
Adoptive parents	10.2
One biological parent	32.3
<i>School status</i> (%)	
Enrolled in school	75.6
Quit	7.9
Suspended/expelled	4.7
Graduated	7.1
<i>Employment status</i> (%)	
Not employed	56.7
Working 20 hrs/week	30.7
Working > 20 hrs/week	12.6
<i>Justice system involvement</i> (%)	
No involvement	49.6
Involved, not mandated to treatment	31.5
Involved, mandated to treatment	18.9
<i>SUD diagnoses</i> (%)	
Cannabis abuse	26.8
Cannabis dependence	57.5
Alcohol abuse	27.6
Alcohol dependence	31.5
Opiate abuse	2.4
Opiate dependence	11.0
<i>Number of sessions at this facility during 12-month follow-up</i>	
Median	18
Mean (SD)	22.9 (19.6)
Range	0-145

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Table 2
Descriptive statistics for predictor and outcome variables over time

Month	N [†]	%	RBB		PDA		InDUC-2R		GSI	
			M	SD	M	SD	M	SD	M	SD
0	127	100	9.6	7.0	45.2	34.3	40.2	24.4	1.1	0.7
3	116	91.3	--	--	53.5	34.6	23.9	17.4	0.7	0.6
6	107	84.3	--	--	48.0	36.7	25.2	19.0	0.8	0.7
12	111	87.4	--	--	46.4	34.2	25.9	19.9	0.8	0.6

Note. RBB = Religious Background and Behavior scale (past-year subscale); PDA = Percent days abstinent; InDUC-2R = Inventory of Drug Use Consequences-Recent scale; GSI = Global Severity Index

[†] Ns in this column represent the number of participants who took part in the assessment. There was a small amount of missing data at months 0, 6, and 12, such that actual Ns for the self-report measures (RBB, InDUC-2R, and GSI) at these timepoints are slightly smaller (by 1-4 data points) than the Ns listed.

Table 3
Correlations between study variables at month 0

	1	2	3	4
1. RBB	---			
2. PDA	.12	---		
3. InDUC-2R	.33**	-.14	---	
4. GSI	.11	-.16	.41**	---

Note. RBB = Religious Background and Behavior scale (past-year subscale); PDA = Percent days abstinent; InDUC-2R = Inventory of Drug Use Consequences-Recent scale; GSI = Global Severity Index

**
 $p < .01$

Table 4
Comparison of problem recognition groups at month 0

	Problem recognition group		Test statistic	<i>p</i>
	No <i>M</i> (<i>SD</i>)	Yes <i>M</i> (<i>SD</i>)		
Age (in years)	17.1 (1.4)	17.2 (1.1)	$t = 0.70$	0.45
Gender (% female)	18.0	28.6	$\chi^2 = 1.84$	0.18
RBB	7.6 (5.9)	10.9 (7.4)	$t = -2.76$	0.007
PDA	43.1 (31.3)	46.6 (36.2)	$t = -0.58$	0.58
InDUC-2R	24.9 (17.9)	49.9 (23.0)	$t = -6.77$	< .001
GSI	0.9 (0.6)	1.2 (0.8)	$t = -2.57$	0.01

Note. RBB = Religious Background and Behavior scale (past-year subscale); PDA = Percent days abstinent; InDUC-2R = Inventory of Drug Use Consequences-Recent scale; GSI = Global Severity Index

Table 5
Summary of Growth Curve Analyses Predicting Change in Abstinence over Time

Predictor	Intercept			Change over time (linear)			Change over time (quadratic)		
	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>
Analysis 1: Religiosity as a predictor of change in abstinence									
Intercept	46.86	15.61	<.001	1.31	1.27	.21	-0.12	-1.61	.11
RBB	0.55	1.28	.20	-0.07	-0.49	.63	0.01	0.99	.33
Analysis 2: Problem recognition as a predictor of change in abstinence									
Intercept	45.47	9.54	<.001	0.51	0.31	.76	-0.07	-0.55	.58
Problem recognition	1.68	0.28	.784	1.38	0.65	.52	-0.09	-0.58	.56
Analysis 3: Religiosity × Problem recognition interaction as a predictor of change in abstinence									
Intercept	43.99	8.81	<.001	1.02	0.57	.57	-0.10	-0.79	.43
RBB	-0.84	-1.04	.30	0.26	0.88	.38	-0.02	-0.80	.43
Problem recognition	2.19	0.35	.73	1.13	0.51	.61	-0.09	-0.54	.59
RBB × problem recognition	1.94	2.03	.045	-0.50	-1.45	.15	0.04	1.64	.10

Note: RBB = Religious Background and Behavior scale (past-year subscale; mean centered), *b* = unstandardized regression coefficient; *t* = *t* statistic; *p* = alpha level

Summary of Growth Curve Analyses Predicting Change in Drug-related Consequences over Time

Table 6

Predictor	Intercept			Change over time (linear)			Change over time (quadratic)		
	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>
Analysis 1: Religiosity as a predictor of change in drug-related consequences									
Intercept	38.82	19.47	<.001	-.53	-.07	<.001	0.29	5.95	<.001
RBB	1.00	3.51	.001	-.20	-.18	.03	0.01	1.52	.13
Analysis 2: Problem recognition as a predictor of change in drug-related consequences									
Intercept	24.11	8.33	<.001	-.09	-.11	.27	0.09	1.12	.26
Problem recognition	24.23	6.54	<.001	-.64	-.53	<.001	0.34	3.47	.001
Analysis 3: Religiosity × Problem recognition interaction as a predictor of change in drug-related consequences									
Intercept	24.17	8.16	<.001	-.18	-.11	.27	0.09	1.08	.28
RBB	0.02	0.04	.97	-.04	-.20	.84	0.001	0.12	.90
Problem recognition	22.94	6.14	<.001	-.34	-.06	<.001	0.32	3.13	.002
RBB × problem recognition	0.87	1.53	.13	-.11	-.53	.60	0.01	0.32	.75

Note. RBB = Religious Background and Behavior scale (past-year subscale; mean centered). *b* = unstandardized regression coefficient; *t* = *t* statistic; *p* = alpha level.

Table 7
Summary of Growth Curve Analyses Predicting Change in Psychological Distress over Time

Predictor	Intercept			Change over time (linear)			Change over time (quadratic)		
	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>
Analysis 1: Religiosity as a predictor of change in psychological distress									
Intercept	1.04	16.01	<.001	-.09	-.45	<.001	0.01	4.19	<.001
RBB	0.01	1.16	.25	-.01	-.35	.73	0.0001	0.43	.67
Analysis 2: Problem recognition as a predictor of change in psychological distress									
Intercept	0.82	8.13	<.001	-.06	-.06	.04	0.004	1.90	.06
Problem recognition	0.35	2.66	.01	-.04	-.03	.31	0.002	0.85	.40
Analysis 3: Religiosity × Problem recognition interaction as a predictor of change in psychological distress									
Intercept	0.82	7.67	<.001	-.07	-.26	.03	0.01	2.17	.03
RBB	-.0002	-.012	.91	-.01	-.89	.37	0.0004	1.04	.30
Problem recognition	0.34	2.50	.01	-.03	-.74	.46	0.001	0.52	.61
RBB × problem recognition	0.01	0.52	.60	0.01	0.94	.35	-.0001	-.04	.30

Note. RBB = Religious Background and Behavior scale (past-year subscale; mean centered). *b* = unstandardized regression coefficient; *t* = *t* statistic; *p* = alpha level.