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## Alcohol Use and Religiousness/Spirituality Among Adolescents

**John R. Knight, MD, Lon Sherritt, MPH, Sion Kim Harris, PhD, David W. Holder, MD, MPH, John Kulig, MD, MPH, Lydia A. Shrier, MD, MPH, Joy Gabrielli, BA, and Grace Chang, MD, MPH**

Department of Pediatrics and the Division on Addictions at Cambridge Health Alliance, Harvard Medical School, Boston, MA; the Center for Adolescent Substance Abuse Research, Children's Hospital, Boston, MA; the Division of General Pediatrics and the Division of Adolescent/Young Adult Medicine, Children's Hospital, Boston, MA; the Department of Pediatrics, Tufts University School of Medicine, Boston, MA; the Division of General Pediatrics and Adolescent Medicine, Floating Hospital for Children at Tufts-New England Medical Center, Boston, MA; the Department of Psychiatry, Brigham and Women's Hospital, Boston, MA; and the Department of Psychiatry, Harvard Medical School, Boston, MA

### Abstract

**Background**—Previous studies indicate that religiousness is associated with lower levels of substance use among adolescents, but less is known about the relationship between spirituality and substance use. The objective of this study was to determine the association between adolescents' use of alcohol and specific aspects of religiousness and spirituality.

**Methods**—Twelve- to 18-year-old patients coming for routine medical care at three primary care sites completed a modified Brief Multidimensional Measure of Religiousness/Spirituality; the Spiritual Connectedness Scale; and a past-90-days alcohol use Timeline Followback calendar. We used multiple logistic regression analysis to assess the association between each religiousness/spirituality measure and odds of any past-90-days alcohol use, controlling for age, gender, race/ethnicity, and clinic site. Timeline Followback data were dichotomized to indicate any past-90-days alcohol use and religiousness/spirituality scale scores were z-transformed for analysis.

**Results**—Participants (n = 305) were 67% female, 74% Hispanic or black, and 45% from two-parent families. Mean  $\pm$  SD age was 16.0  $\pm$  1.8 years. Approximately 1/3 (34%) reported past-90-day alcohol use. After controlling for demographics and clinic site, Religiousness/Spirituality scales that were not significantly associated with alcohol use included: Commitment (OR = 0.81, 95% CI 0.36, 1.79), Organizational Religiousness (OR = 0.83, 95% CI 0.64, 1.07), Private Religious Practices (OR = 0.94, 95% CI 0.80, 1.10), and Religious and Spiritual Coping – Negative (OR = 1.07, 95% CI 0.91, 1.23). All of these are measures of *religiousness*, except for Religious and Spiritual Coping – Negative. Scales that were significantly and negatively associated with alcohol use included: Forgiveness (OR = 0.55, 95% CI 0.42–0.73), Religious and

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Reprint requests to Dr. John R. Knight, Center for Adolescent Substance Abuse Research, Children's Hospital Boston, 300 Longwood Avenue, Boston, MA 02115. john.knight@childrens.harvard.edu.

The study protocol was approved by the Committee on Clinical Investigations at Children's Hospital Boston, and the Human Investigations Review Committee of Tufts, New England Medical Center.

Spiritual Coping –Positive (OR = 0.67, 95% CI 0.51–0.84), Daily Spiritual Experiences (OR = 0.67, 95% CI 0.54–0.84), and Belief (OR = 0.76, 95% CI 0.68–0.83), which are all measures of *spirituality*. In a multivariable model that included all significant measures, however, only Forgiveness remained as a significant negative correlate of alcohol use (OR = 0.56, 95% CI 0.41, 0.74).

**Conclusions**—Forgiveness is associated with a lowered risk of drinking during adolescence.

### Keywords

spirituality; religion; substance-related disorders; alcoholism; adolescence

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Adolescence is an important time of life when young people begin to assert their independence and make personal decisions that will form the basis of adult behavior. Research has shown that people who begin drinking during adolescence are more likely to have alcohol dependence as adults, compared with those who wait until their adult years.<sup>1–3</sup> It is therefore important to identify modifiable factors that influence adolescents' decision to use alcohol.

Religiousness has been consistently identified as a protective influence on adolescent substance abuse.<sup>4–7</sup> A national survey by the Gallup Poll found that 95% of teenagers believe in God, 93% believe that God loves them, 80% say that their religious beliefs are very or fairly important to them, and 52% have attended a religious service in the past month.<sup>8</sup> Miller et al<sup>9</sup> found that religiousness had twice the negative strength of association with substance dependence among adolescents compared with adults.

However, not enough research has focused on the protective association of religiousness and its potential for positive health outcomes.<sup>7</sup> This may be related in part to the perceived difficulty in measuring the different aspects of religiousness/spirituality and differentiating them from other aspects of identity such as culture, ethnicity and personality traits.<sup>10</sup>

As knowledge in the field continues to expand, researchers have acknowledged a multidimensional understanding of religiousness.<sup>11–14</sup> This has enabled studies to better define the constructs that they seek to measure. Francis<sup>15</sup> demonstrated that belief in God was one of the strongest aspects of religiousness associated with adolescents' attitudes toward substance use. Several other studies have demonstrated that participation (eg, attendance at religious services) and salience (eg, importance of religious beliefs, commitment to religious beliefs) are stronger predictors than simple affirmation (eg, church membership, denominational affiliation).<sup>16,17</sup> Nonnemaker et al<sup>18</sup> examined the relationship between public religiousness (attendance at religious services and participation in youth group activities) and private religiousness (prayer and importance of religion) and adolescent substance use. Both were found to be protective factors, but public religiousness was found to have greater impact on *regular* use of substances while private religiousness was found to have greater impact on *experimental* use of substances.

Research has moved even further to distinguish a difference between “Religiousness” and “Spirituality,” related terms that are sometimes used interchangeably. “Religiousness”

generally refers to beliefs, practices and behaviors associated with organized religious groups, such as church affiliation and attendance at religious services.<sup>19</sup> “Spirituality” generally refers to the more personal and abstract beliefs and practices, such as a sense of the divine in daily life or communication with a transcendent power, which may or may not be associated with organized religious practices.<sup>19</sup> These two concepts are not mutually exclusive.

Little is known about the spiritual experiences, beliefs and practices of adolescents, how these factors are protective against the use of alcohol and drugs, and whether these spiritual factors are distinct from religious factors. A better understanding of these associations will lead to more effective substance use prevention and intervention approaches for adolescents. For example, specific spiritual constructs may be shown to produce a protective effect against early initiation to alcohol use and, if so, clinicians should inquire about them and offer positive reinforcement when adolescent patients mention them. Alternatively, a greater understanding of the effects of spiritual connectedness may indicate that assessment of both religious affiliation and religious peer group influences should be included as part of counseling for alcohol- and drug-involved youth.

The objective of this study was to identify specific aspects of religiousness and spirituality that are associated with alcohol use among adolescents. We hypothesized that higher spirituality scale scores will be associated with lower rates of alcohol use, but that the effect size will vary among scales and be independent of religiousness.

## Method

This prospective, observational study was conducted in a convenience sample (n = 305) of 12- to 18-year-old patients arriving for routine care between May 2001 and April 2002 at one of three adolescent primary care medical clinics in Boston, Massachusetts. They were the Adolescent/Young Adult Medical Practice at Children’s Hospital Boston (CHB), the Adolescent Clinic at the Floating Hospital for Children (FHC), and the Adolescent Clinic at the Martha Eliot Health Center (MEHC). These clinics serve both inner city and suburban youth from a wide range of social strata, racial groups, and ethnic backgrounds. A research assistant who was not involved inpatient care invited patients to participate while in the waiting room (FHC, MEHC), or flagged the clinic records of age-eligible patients so that the medical care provider could invite them to participate at the conclusion of the medical visit (CHB).

Patients who were unable to read and understand English were excluded (n = 14), as were those with acute medical or psychiatric problems that precluded participation in research on the day of the clinic visit (n = 18). Interested patients met with the research assistant, who explained the study procedures and obtained parental consent, either in person or by telephone, as well as signed adolescent assent. Patients whose parents could not be reached to provide consent were excluded (n = 16).

Participants were told that the purpose of the study was to assess the relationship between spirituality and alcohol/drug use and that their answers would be kept confidential. They

were informed that the research team would notify their provider if a serious problem (eg, current suicidality) were identified so that appropriate care could be arranged. The Children's Hospital Boston Committee on Clinical Investigations and the Tufts New England Medical Center Human Investigations Review Committee approved the study protocol.

The assessment battery included eight items recording demographic information; a 90-day Timeline Followback Calendar (TLFB)<sup>20</sup> that separately recorded use of alcohol, cannabis and other drugs; a 66-item modified Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS),<sup>19</sup> and the 15-item Spiritual Connectedness Scale (eg, "I feel very close to some of my friends at church").<sup>21</sup>

The BMMRS was developed by a national work group supported by the National Institutes of Health and the Fetzer Institute, whose charge was to identify "key dimensions of religiousness/spirituality as they relate to physical and mental health."<sup>19</sup> The BMMRS includes scales measuring *religiousness*: Private Religious Practices (5 items, alpha = 0.76) (eg, "How often do you read the Bible or other religious literature?"), Religious Support (12 items; 3 each for anticipated support (alpha = 0.95) (eg, "If you had a problem or were faced with a difficult situation, how much comfort would the people in your congregation be willing to give you?"), emotional support received (alpha = 0.94) (eg, "How often do people in your congregation make you feel loved and cared for?"), emotional support given (alpha = 0.93) (eg, "How often do you make the people in your congregation feel loved and cared for?"), and negative interaction support experiences (alpha = 0.73) (eg, "How often do the people in your congregation make too many demands on you?"), Religious Commitment (2 items assessing monthly financial contribution and hours per week devoted to religious/spiritual activities), Organizational Religiousness (2 items) (eg, "How often do you attend religious services?"), and Religious Preference (1 item) ("At the present time, what is your religious preference?"). The BMMRS also includes scales measuring *spirituality*: Daily Spiritual Experiences (15 items, alpha = 0.94) (eg, "I am spiritually touched by the beauty of creation"), Belief (1 item) ("I believe in a God who watches over me"), Forgiveness (3 items, alpha = 0.68) (eg, "I have forgiven myself for things that I have done wrong"), Religious and Spiritual Coping – Positive (5 items, alpha = 0.88) (eg, "I look to God for strength, support and guidance"), and Religious and Spiritual coping – Negative (5 items, alpha = 0.54) (eg, "I wonder whether God has abandoned me").

A research assistant administered the TLFB and recorded participants' responses, and then monitored completion of the questionnaire. Each participant received a \$25 merchandise certificate as compensation for his/her time. All data were independently entered twice into a data management program. The dual entry files were then compared and discrepancies reconciled by checking the original data source. Text variables (eg, Religious Preference) were independently coded by at least two investigators and disagreements resolved by the lead investigator.

Frequencies and descriptive statistics were computed for all demographic items and spirituality scale scores. We separately computed frequencies of demographic items, self-reported attendance at a religious congregation, religious preference, and clinic site for the

subgroup of drinkers ( $n = 103$ ) and used the  $\chi^2$  test adjusted for cluster effects of the 3-site sample design to compare proportions. The religiousness/spirituality response scales varied in length from 1 to 16 items, and in response categories from 4 to 8 forced choices, making unadjusted comparisons very difficult to interpret. Therefore, we performed z transformation of these scores to facilitate comparisons of effect measures across individual scales. Because substance use frequency and quantity data were highly skewed, TLFB data were dichotomized to indicate presence or absence of past-90-day use of alcohol, cannabis, other drugs, and any substance. Few differences were found in analyses across substance use categories (alcohol versus cannabis versus other drugs versus any substance), so we are reporting alcohol use data only.

We used logistic regression analysis to examine the relationship between alcohol use and spirituality, with dichotomized past-90-day alcohol use as the dependent variable and the z-transformed total scale score as the independent variable, while controlling for age, race/ethnicity, and clinic site where recruitment occurred. We adjusted the precision estimates for the effect on the sample of clinic site clustering with SUDAAN statistical software, using site as the nest variable. The odds ratio, 95% confidence interval, and significance level were computed. We then performed backward selection multivariable logistic regression analysis, using variable entry and exit criteria of  $P > 0.20$  for the change in maximum likelihood criteria.<sup>22</sup>

## Results

The study sample ( $n = 305$ ) was 66.6% female and included a majority of nonwhite participants. (Table 1) The mean age was  $16.0 \pm 1.8$  years. Slightly less than half of the participants (45.2%) came from households with two parents and most (85.5%) had at least one parent with a high school education. About three-fourths of participants (79.7%) reported attending a religious congregation during the past year. Of 264 participants who reported a religious preference, 67.0% were “Christian,” 12.9% were “Other” (eg, Jewish, Buddhist), 11.4% were “Atheist/None,” and 8.7% were “Don’t know/Confused.” Slightly less than two-thirds of participants (63.3%) were recruited from one clinic site (CHB).

Slightly more than one-third of participants (33.7%) reported alcohol use within the past 90 days, and drinking data were highly right-skewed. Among those who reported past-90-days drinking ( $n = 103$ ), the median number of drinking days was 2 (range 1–43), median drinks per drinking day was 2 (range 0.3–14) and median total drinks during the past 90-days was 5 (range 1–276). Alcohol use was not associated with gender, socioeconomic indicators (two-parent family, parent educational level), past-year attendance at a religious congregation, or clinic site. Alcohol use was significantly associated with older age and “white” race/ethnicity. The “None/Atheist” group had the highest apparent rate of alcohol use (53.3%), followed by “Other” (47.1%), “Christian” (31.1%), and “Don’t know/Confused” (21.7%). After adjusting for sample cluster effect of clinic site, however, these differences did not rise to the level of statistical significance.

The odds ratios for past-90-day alcohol use for religiousness/spirituality scales are presented in Table 2. The odds were computed based on an increase of one standard deviation in the

scale score while controlling for age, race/ethnicity, and clinic site. Forgiveness, Religious and Spiritual Coping – Positive, Daily Spiritual Experiences, and Belief, all measures of *spirituality*, were associated with significantly lower odds of alcohol use for the entire sample. Commitment, Organizational Religiousness, Private Religious Practices, and Religious and Spiritual Coping – Negative were not significantly associated with alcohol use. All of these are measures of *religiousness*, except for Religious and Spiritual Coping – Negative.

We separately analyzed data on the subgroup of participants who reported past-year attendance at a religious congregation (n = 239), for whom certain scales would be most relevant (ie, scales that assumed affiliation with a religious congregation). The only measure associated with significantly lower odds of alcohol use among past-year congregants was Spiritual Connectedness. Scales not associated with alcohol use among congregants were Religious Support – Anticipated, Religious Support – Negative Interaction, Religious Support – Emotional Given and Religious Support – Emotional Received, as well as Religious Commitment.

Multivariable analysis of past-90-days alcohol use and religiousness/spirituality scales is presented in Table 3. We ran separate models for all participants and for past-year congregants. Forgiveness was the only statistically significant spirituality/religiousness variable that remained in the model for all participants (n = 295), as well as for the model for those attending a religious congregation (n = 234).

To assess the association between Forgiveness and alcohol use in more detail, we entered each of the three Forgiveness items: (“I have forgiven myself for things that I have done wrong,” “I have forgiven those who hurt me,” “I know that God forgives me”) individually into three separate final models to examine the effect of each specific type of forgiveness. For the entire sample, each of the three forgiveness items was significantly and negatively associated with alcohol use (*p*-value range 0.02–0.04). However, the “I have forgiven those who hurt me” item had a relatively weaker effect (OR = 0.67) compared with the other two items (OR = 0.59 for “I know that God forgives me” and OR = 0.57 for “I have forgiven myself”). The item on forgiving others had an even weaker effect, failing to meet statistical significance, in analysis of the subgroup of youth who participated in a congregation. For the subgroup of past-year congregants, the “I know that God forgives me” item had the strongest protective effect on alcohol use (OR = 0.44).

## Discussion

This study suggests that forgiveness is an important spiritual construct for adolescents and that it is associated with lower risk of alcohol use during this vulnerable developmental period. Unforgiving thoughts have been shown to have a negative effect on skin conductance, heart rate, and blood pressure.<sup>23</sup> It is therefore not surprising that previous studies have also found forgiveness to be associated with improved outcomes in rehabilitation from traumatic brain injury,<sup>24</sup> patients with cancer,<sup>25,26</sup> management of low back pain,<sup>27</sup> and alleviating Post Traumatic Stress Disorder symptom severity,<sup>28</sup> among other health problems. One study has shown forgiveness therapy to be important in recovery

for adult substance abuse treatment clients.<sup>29</sup> However, we could find no previous studies on the relationship between forgiveness and substance use during adolescence.

Some have suggested that forgiveness can be characterized as either a state or a trait.<sup>30,31</sup> State forgiveness is associated with a specific other person or act, while trait forgiveness is an individual temperamental characteristic. The items in our study primarily measured “trait forgiveness” and it remains unknown whether state forgiveness is similarly protective of alcohol use during adolescence. Future studies should examine this question and further explore the relationship between various aspects of forgiveness and substance use during adolescence, as well as the relationship between forgiveness and other high risk behaviors and mood states.

Our study did not find that alcohol use during adolescence was significantly associated with religious preference, although our sample was not adequately powered to fully examine this question. Other studies have shown a strong association between religious preference and substance use. In one study of more than 2000 Canadian adolescents, Adlaf and Smart<sup>32</sup> found Catholic youth less likely than Protestant or nonaffiliated youth to have used cannabis or other illicit drugs during the past year. Other, even larger studies, have shown that youth from denominations with clear prohibitions on use of alcohol or drugs (eg, evangelical Christians, Mormons) have lower rates of substance use.<sup>33,34</sup>

While we found that other spirituality measures (Religious Coping, Daily Spiritual Experiences, Belief) had a significant, negative association with alcohol use when analyzed individually, the effect was not seen in our multivariable model. This finding may be due to colinearity, or it may be that all of these scales are in fact measuring different facets of the same higher-order construct of intrinsic religiousness/spirituality. Our study also found no association between alcohol use and Religious Coping – Negative, which has been found to be a significant correlate of poorer health outcomes in adult studies.<sup>34,35</sup> It may be that adolescents are less likely than adults to feel that God is punishing them or has abandoned them, or it may be that our measure was not sufficiently sensitive for use in an adolescent sample. This association should be further studied in a larger sample of adolescents, with a measurement tool that has been specifically validated among adolescents.

This study has some potential limitations. First the sample size was relatively small, yielding low power for subgroup analyses. Second, participants were a convenience sample, which may not be representative of all adolescent clinic patients or the larger adolescent population. The sample had a high proportion of racial/ethnic minorities (Hispanics and African Americans), which included large numbers of evangelical Christians and Roman Catholics. The study required parental consent, which raises the possibility of self-selection bias in the direction of a lower risk sample (ie, one with less substance use). This was a cross sectional study that cannot determine causal relationships. In addition, because of the rapid development of cognitive, psychological, social, and emotional processes during adolescence, the relationship between alcohol use and religiousness/spirituality may be fragile. Future studies should be longitudinal in design to overcome this limitation.

The measurement battery also presents potential limitations. The TLFB relies on self-report to measure substance use and there were no collateral reports or objective measures. Nonetheless, previous studies have shown self-report to be a reliable means of measuring substance use and it compares favorably with other methods of substance use detection (eg, laboratory testing).<sup>36,37</sup> Lastly, not all of the religiousness/spirituality scales used in this study, notably those from the BMMRS, have been previously validated in adolescents. However, we have demonstrated in a separate report from this dataset that these measures generally have adequate internal consistency, test-retest reliability, and good discriminant validity. (Harris SK, personal communication).

In summary, this study suggests that forgiveness is an important correlate of adolescent substance use, and this may have implications for both prevention and treatment programs targeting youth. Future studies, which have larger and more representative samples, should further investigate the mechanism of this association, and further examine the various aspects of forgiveness (self, others, divine) and their relationship to substance use and other high-risk behaviors.

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## References

1. Grant JD, Scherrer JF, Lynskey MT, et al. Adolescent alcohol use is a risk factor for adult alcohol and drug dependence: evidence from a twin design. *Psychol Med.* 2006; 36:109–118. [PubMed: 16194286]
2. Grant BF. Prevalence and correlates of alcohol use and DSM-IV alcohol dependence in the United States: results of the National Longitudinal Alcohol Epidemiologic Survey. *J Stud Alcohol.* 1997; 58:464–473. [PubMed: 9273910]
3. Robins LN, Przybeck TR. Age of onset of drug use as a factor in drug and other disorders. *NIDA Res Monogr.* 1985; 56:178–192. [PubMed: 3929100]
4. Amoateng YA, Bahr SJ. Religion, family, and adolescent drug use. *Sociological Perspective.* 1986; 29:53–73.
5. Foxcroft DR, Lowe G. Adolescent drinking, smoking and other substance use involvement: links with perceived family life. *J Adolesc.* 1995; 18:159–177.
6. Kent, R. The religiosity and parent/child socialization connection with adolescent substance abuse. In: Barber, B.; Rollins, B., editors. *Parent-Adolescent Relationships.* Lanham, MD: University Press of America; 1990. p. 143-165.
7. Ritt-Olson A, Milam J, Unger JB, et al. The protective influence of spirituality and 'health-as-a-value' against monthly substance use among adolescents varying in risk. *J Adolesc Health.* 2004; 34:192–199. [PubMed: 14967342]
8. Gallup, GH.; Bezilla, R. *The religious life of young Americans.* Princeton: The George H. Gallup International Institute; 1992.



9. Miller L, Davies M, Greenwald S. Religiosity and substance use and abuse among adolescents in the National Comorbidity Survey. *J Am Acad Child Adolesc Psychiatry*. 2000 Sep;39:1190–1197. [PubMed: 10986817]
10. Wechsler H, Thum D, Demone HW Jr, et al. Religious-ethnic differences in alcohol consumption. *J Health Soc Behav*. 1970; 11:21–29. [PubMed: 5448868]
11. Allport GW, Ross JM. Personal religious orientation and prejudice. *J Pers Soc Psychol*. 1967; 5:432–443. [PubMed: 6051769]
12. Amey CH, Albrecht SL, Miller MK. Racial differences in adolescent drug use: the impact of religion. *Substance Use Misuse*. 1996; 31:1311–1332. [PubMed: 8879076]
13. D’Onofrio BM, Murrelle L, Eaves LJ, et al. Adolescent religiousness and its influence on substance use: preliminary findings from the Mid-Atlantic School Age Twin Study. *Twin Res*. 1999; 2:156–168. [PubMed: 10480750]
14. Francis LJ, Mullen K. Religiosity and attitudes towards drug use among 13–15 year olds in England. *Addiction*. 1993; 88:665–672. [PubMed: 8518717]
15. Francis LJ. The impact of personality and religion on attitude towards substance use among 13–15 year olds. *Drug Alcohol Depend*. 1997; 44:95–103. [PubMed: 9088781]
16. Bahr SJ, Hawks RD, Wang G. Family and religious influences on adolescent substance abuse. *Youth and Society*. 1993; 24:443–465.
17. Potvin RH, Lee CF. Multistage path models of adolescent alcohol and drug use: age variations. *J Stud Alcohol*. 1980; 41:531–542. [PubMed: 6968004]
18. Nonnemaker JM, McNeely CA, Blum RW. Public and private domains of religiosity and adolescent health risk behaviors: evidence from the National Longitudinal Study of Adolescent Health. *Soc Sci Med*. 2003; 57:2049–2054. [PubMed: 14512236]
19. Fetzer Institute. *Multidimensional Measurement of Religiousness, Spirituality for Use in Health Research. A Report of a National Working Group*. Kalamazoo, MI: Fetzer Institute; 1999.
20. Sobell, L.; Sobell, M. *Alcohol Timeline Followback User’s Manual*. Toronto: Addiction Research Foundation; 1995.
21. Holder DW, DuRant RH, Harris TL, et al. The association between adolescent spirituality and voluntary sexual activity. *J Adolesc Health*. 2000; 26:295–302. [PubMed: 10734277]
22. Mickey RM, Greenland S. The impact of confounder selection criteria on effect estimation. *Am J Epidemiol*. 1989; 129:125–137. [PubMed: 2910056]
23. van Oyen Witvliet C, Ludwig TE, Vander Laan KL. Granting forgiveness or harboring grudges: implications for emotion, physiology, and health. *Psychol Sci*. 2001; 12:117–123. [PubMed: 11340919]
24. Gisi TM, D’Amato RC. What factors should be considered in rehabilitation: are anger, social desirability, and forgiveness related in adults with traumatic brain injuries? *Int J Neurosci*. 2000; 105:121–133. [PubMed: 11069052]
25. Mickley JR, Cowles K. Ameliorating the tension: use of forgiveness for healing. *Oncol Nurs Forum*. 2001; 28:31–37. [PubMed: 11198895]
26. Romero C, Friedman LC, Kalidas M, et al. Self-forgiveness, spirituality, and psychological adjustment in women with breast cancer. *J Behav Med*. 2006; 29:29–36. [PubMed: 16362244]
27. Carson JW, Keefe FJ, Goli V, et al. Forgiveness and chronic low back pain: a preliminary study examining the relationship of forgiveness to pain, anger, and psychological distress. *J Pain*. 2005; 6:84–91. [PubMed: 15694874]
28. Witvliet CV, Phipps KA, Feldman ME, et al. Posttraumatic mental and physical health correlates of forgiveness and religious coping in military veterans. *J Trauma Stress*. 2004; 17:269–273. [PubMed: 15253099]
29. Lin WF, Mack D, Enright RD, et al. Effects of forgiveness therapy on anger, mood, and vulnerability to substance use among inpatient substance-dependent clients. *J Consult Clin Psychol*. 2004; 72:1114–1121. [PubMed: 15612857]
30. Lawler KA, Younger JW, Piferi RL, et al. A change of heart: cardiovascular correlates of forgiveness in response to interpersonal conflict. *J Behav Med*. 2003; 26:373–393. [PubMed: 14593849]

31. Lawler KA, Younger JW, Piferi RL, et al. The unique effects of forgiveness on health: an exploration of pathways. *J Behav Med.* 2005; 28:157–167. [PubMed: 15957571]
32. Adlaf EM, Smart RG. Drug use and religious affiliation, feelings, and behavior. *Br J Addict.* 1985; 80:163–171. [PubMed: 3860236]
33. Hadaway CK, Elifson KW, Peterson DM. Religious involvement and drug use among urban adolescents. *J Scientific Study of Religion.* 1984; 23:109–128.
34. Pargament KI, Koenig HG, Tarakeshwar N, et al. Religious coping methods as predictors of psychological, physical and spiritual outcomes among medically ill elderly patients: a two-year longitudinal study. *J Health Psychol.* 2004; 9:713–730. [PubMed: 15367751]
35. Pargament KI, Koenig HG, Perez LM. The many methods of religious coping: development and initial validation of the RCOPE. *J Clin Psychol.* 2000; 56:519–543. [PubMed: 10775045]
36. Babor TF, Kranzler HR, Lauerman RJ. Early detection of harmful alcohol consumption: comparison of clinical, laboratory, and self-report screening procedures. *Addict Behav.* 1989; 14:139–157. [PubMed: 2728952]
37. Winters KC, Stinchfield RD, Henly GA, et al. Validity of adolescent self-report of alcohol and other drug involvement. *Int J Addict.* 1990; 25:1379–1395. [PubMed: 2132719]

### Key Points

- Multivariable analysis found that forgiveness was the only significant correlate of alcohol use.
- The association was in the negative direction (high forgiveness: lower risk of alcohol use).

**Table 1**

Demographic characteristics of total sample and participants reporting past-90-day alcohol use (n = 103/305)

	Total sample (n = 305)		Past-90-day alcohol use (n = 103)		P
	n	%	n	%	
Gender					
Female	203	66.6	67	33.0	0.81
Male	102	33.4	36	35.0	
Median age (16.0 years)					
Older	153	50.2	77	50.7	0.05
Younger	152	49.8	26	17.0	
Race/ethnicity					
Asian non-Hispanic	45	7.2	5	22.7	0.02
Black non-Hispanic	103	33.8	31	30.1	
Hispanic	123	40.3	38	30.9	
White non-Hispanic	22	14.8	26	57.8	
Other non-Hispanic	3	3.9	3	25.0	
Parents in household					
Two parent household	138	45.2	47	33.5	
<Two parent household	167	54.8	56	34.1	0.93
Highest parent education level (3 cats.)					
<High school grad	41	14.4	15	36.6	0.19
High school grad	125	44.0	36	28.8	
College grad	118	41.5	47	39.8	
Congregation attendance (past year)					
Yes	239	79.7	80	34	0.58
No	61	20.3	22	36	
Religious preference					
None/atheist	30	11.4	16	53.3	0.09
Don't know/confused	23	8.7	5	21.7	
Christian	177	67.0	55	31.1	
Other	34	12.9	16	47.1	

Site	Total sample (n = 305)		Past-90-day alcohol use (n = 103)		P
	n	%	n	%	
CHB adolescent clinic <sup>a</sup>	193	63.3	70	36.3	0.08
MEHC adolescent clinic <sup>b</sup>	50	16.4	13	26.0	
Tufts-NEMC adolescent clinic <sup>c</sup>	62	20.3	20	32.3	

<sup>a</sup>Children's Hospital Boston, Boston, MA;

<sup>b</sup>Martha Eliot Health Center, Boston, MA;

<sup>c</sup>Tufts-New England Medical Center, Boston, MA.

**Table 2**

Association of religious/spirituality scales and past-90-day alcohol use controlling for age, race/ethnicity, and clinic site

Measure	Items	n	Odds ratio (95% CI)	P
All responders				
Forgiveness	3	295	0.55 (0.42, 0.73)	0.01
Religious/spiritual coping – positive	5	296	0.67 (0.51, 0.84)	0.02
Daily spiritual experiences	15	293	0.67 (0.54, 0.84)	0.02
Belief	1	302	0.76 (0.68, 0.83)	0.01
Commitment	1	299	0.81 (0.36, 1.79)	0.36
Organizational religiousness	2	296	0.83 (0.64, 1.07)	0.08
Private religious practices	5	295	0.94 (0.80, 1.10)	0.22
Religious/spiritual coping – negative	5	295	1.07 (0.91, 1.23)	0.18
Past-year congregants <sup>a</sup>				
Spiritual connectedness	15	212	0.60 (0.41, 0.88)	0.03
Religious support – anticipated	3	231	0.68 (0.39, 1.18)	0.10
Religious support – negative interaction	3	229	0.70 (0.39, 1.29)	0.13
Religious support – emotional given	3	228	0.77 (0.55, 1.10)	0.09
Religious support – emotional received	3	233	0.78 (0.56, 1.07)	0.07
Religious commitment	2	194	0.76 (0.44, 1.30)	0.16

<sup>a</sup>N = 239 who reported attending a religious congregation at least once during the past year.

**Table 3**

Religious/spirituality variables remaining in multivariable logistic regression model, <sup>a</sup> and individual items in each scale separately

<b>Model (all) n = 295</b>	<b>Odds ratio (95% CI)</b>	<b>P</b>
Forgiveness	0.55 (0.41, 0.76)	0.01
I have forgiven myself	0.57 (0.40, 0.82)	0.02
I have forgiven others	0.67 (0.67, 0.98)	0.04
God forgives me	0.59 (0.40, 0.91)	0.03
<b>Model (past-year congregants) n = 234</b>	<b>Odds ratio (95% CI)</b>	<b>P</b>
Forgiveness	0.51 (0.30, 0.87)	0.03
I have forgiven myself	0.60 (0.30, 1.20)	0.09
I have forgiven others	0.77 (0.45, 1.33)	0.18
God forgives me	0.44 (0.23, 0.85)	0.03

<sup>a</sup>Using backwards selection, with change in maximum likelihood criteria ( $P > 0.20$  enter/exit).