ORIGINAL ARTICLE

The Protective Influence of Spirituality and "Health-as-a-Value" Against Monthly Substance Use Among Adolescents Varying in Risk

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Purpose: To investigate the influence of two potentially protective factors, Health-as-a-Value and spirituality, on monthly alcohol, cigarette, and marijuana use in two multiethnic groups of adolescents varying in risk.

Methods: Three-hundred-eighty-two students from continuation/alternative high school, a population considered at risk for drug use, participated in the study. The other sample of 260 students was drawn from a medical magnet high school, and is considered to be at lower risk. Similar surveys containing measures of spirituality, "Health-as-a-Value," and monthly substance use, were distributed. Logistic regression analyses were performed.

Results: The analyses revealed that spirituality was protective against monthly alcohol use and marijuana use in the lower risk sample. In the higher risk sample, spirituality was protective against all monthly use. "Health-as-a-Value" (HAV) was protective against monthly alcohol use in the low risk sample, and protective against all monthly use in the higher risk sample. Importantly, when both constructs were entered into the same model, spirituality and HAV were independently protective of all monthly use for the higher risk sample and of monthly alcohol use in the lower risk sample.

Conclusions: These findings extend earlier work on protective factors. "Health-as-a-Value" and spirituality may be protective against substance use in environments with different levels of use. Future studies should explore these findings in longitudinal analyses. © *Society for Adolescent Medicine, 2004*

KEY WORDS:
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"Health-as-a-Value"
Spirituality

Adolescent drug use remains a large problem in the United States. Over 30% of high school students in 1999 reported an episode of binge drinking (more than 5 drinks in one sitting) in the last month, representing an increase from previous years [1]. Alcohol and other drug use is even more prevalent among students who attend alternative high schools, those that provide instruction for students who need specialized attention owing to emotional, behavioral, or other reasons [2].

Although many studies focus on risk factors, (e.g., sensation-seeking [3,4]), little work focuses on factors that may be protective. This negative bias has largely ignored the protective, or positive, characteristics that can have a beneficial influence on important behaviors [5].

Understanding protective factors that can beneficially influence health behaviors in both high-risk and low-risk adolescent samples will lead to the construction of better health promotion campaigns and a better general understanding of their drug use.

Protective factors may be especially important in higher risk environments such as continuation high schools where environments may be less supportive. This study examines two potentially protective constructs. Spiritual beliefs and "Health-as-a-Value" (HAV) can both be conceived of as personal values, and both have shown in earlier studies to be protective against health-compromising behaviors.

Background

Spirituality

Past research on spiritual beliefs and practices has found correlations with a variety of problem behaviors among adolescents, including the probability of carrying weapons [6]. Some findings have suggested a possible direct relationship between degree of spiritual beliefs and health behaviors among adolescents [7]. The influence of spiritual beliefs on drug use in adolescents has not been well-researched.

Research has begun to uncover the relationship between religiosity and substance use. For example, religious/spiritual factors predict less use and fewer problems associated with alcohol, tobacco, and illicit drugs among adults [8]. In addition, the negative associations between religious involvement and substance use are found across both cross-sectional and longitudinal research [9,10]. Among adolescents, personal religiosity (i.e., belief in God) has been associated with rejection of substance use [11], an effect that has been found after controlling for demographics and personality variables [12]. This relationship is stronger among adolescents compared with adults [13].

Spirituality differs from religiosity in that it does not rely on religious group affiliation. The two concepts are certainly intertwined in that individuals high in religiosity will, in all likelihood, be high in spirituality; but high levels of spiritual beliefs may occur independently of any religious connotation. Measures of religiosity have often relied on Judeo-Christian concepts, whereas spirituality measures are designed to address belief systems that are not solely derived from a Judeo-Christian base, and incorporate beliefs in addition to behaviors. Religiosity reflects what people do, as opposed to their belief system. Religion involves beliefs that are organized and institutional, whereas spirituality may not conform exactly to one cultural/religious belief [14]. Measures of religiosity often include church attendance, which may not reflect an adolescent's personal belief system. Adolescents may have high levels of church attendance without a strong personal connection to a belief system.

Fewer studies have looked at the protective influence of spiritual beliefs. It is unclear whether spirituality itself or the influence of spirituality varies across environments. Adolescents in high-risk environments may find personal spirituality to be more helpful in avoiding substance use than adolescents in low-risk environments, especially because those in low-risk environments often have other protective resources at their disposal (e.g., after-school activities, organized sports, etc.). Associations between spirituality and substance use have been found in the cessation literature [15]. Zimmerman and Maton [15] found, among a high-risk sample of African-American youth, that spirituality was protective against marijuana use.

Health-as-a-Value

HAV is the concept that the more a person values health, the more likely s/he is to refrain from health-compromising behaviors. HAV can be seen as a motive for doing a health behavior. Health values may organize health-related beliefs and intentions. This may assign importance to certain kinds of health information or even serve as a filter.

Lau et al [17] found that the value placed on health may determine an individual's choice of health behaviors. Among college students, HAV was associated with protective health behaviors such as alcohol avoidance, physical activity, and nutrition. Gender differences in the impact of HAV were noted. Other studies, as well, have found associations between HAV and health protective behaviors [18,19]. In a recent study, HAV was one of the strongest predictors of healthy behaviors in a college-aged sample [20]. However, few studies have assessed health values among younger adolescents. HAV in an alternative high school population was found to be predictive of addiction concern, but with a possibly unreliable measure [21]. It is unclear whether levels of HAV or the influence of HAV may differ across environments.

Present Study

This study examines the influence of spiritual beliefs and health values on alcohol, tobacco, and marijuana use. Spirituality has been approached from a variety of backgrounds, but it has not been well-studied among adolescents. HAV has been investigated

among college-aged generally-homogeneous populations, but has not been the focus of research among ethnically diverse adolescents. Little is known about how these factors may function in different environments. We assessed a high-risk and a low-risk population. Additionally, we sought to create parsimonious measures of both spirituality and HAV suitable for use with large-scale survey research. Several measures of spirituality are being tested currently, each one carving out its own niche, but no "gold standard" has been set. This measure was designed to be a short measure that adequately addresses global beliefs. Lau et al's measure of HAV was short, but had problems with adolescents in high-risk environments. We hoped to refine the earlier measure and improve on its reliability.

We hypothesized that both spirituality and HAV would be protective against monthly cigarette use, alcohol use, and marijuana use in both groups. In addition, it is predicted that HAV and spirituality will be intercorrelated because both represent personal values. Gender differences will also be explored. Females are expected to have higher levels of HAV. For exploratory purposes, we investigated ethnic and gender differences in spirituality and HAV. We also explored differences in levels of HAV and spirituality in the two risk groups.

Methods

Participants

High-risk sample. Subjects were students attending one of two continuation high schools that were recruited to participate in a larger study on smoking cessation and drug use. Institutional Review Board (IRB) approval was obtained. All students were eligible to participate if passive consent was obtained and active student assent was given. The consent rate for both schools exceeded 60%. A total of 382 students attending two continuation/alternative high schools in Riverside, California completed the questionnaire.

Low-risk sample. Subjects in this sample were students attending a public magnet high school that attracts students from ethnically diverse neighborhoods throughout the Los Angeles area. Students in the high school were eligible to participate if they were in grades 9–12 and provided active written parental and student consent. Of the 260 students invited to participate, 15 (6%) did not provide consent, 34 (13%) provided consent but were absent from school on the day of data collection, and the remaining 211 (81%) completed the questionnaire.

Procedure

Scales were included as part of two larger studies. In the high-risk sample, the study's main focus was drug use. In the lower risk sample, the focus of that study was cultural values, and smoking behavior. No comparisons between nonrespondents and actual respondents were feasible because surveying of nonrespondents was not permitted by the IRB.

Before data collection, parental consent was sought. If parental consent was obtained, then student assent was also requested. If both parental consent and student assent were given, then trained data collectors administered the surveys. Surveys were given during normal class time, and took approximately 45 minutes to complete. All surveys were anonymous (students were asked not to write their names or any other identifying information on their questionnaires).

Measures

Spirituality. Based, in part, on the measurement items described by Sussman et al [18] that were adapted from the Systems of Belief Inventory [21], by a review of the literature, and by consultation with researchers working the field, a new 8-item spirituality scale was constructed. The scale includes items related to spiritual activities (i.e., "I enjoy attending functions held by my religious or spiritual group"), items intended to reflect the coping ability of spirituality (i.e., "During times of stress, my spiritual beliefs have been strengthened"), and items meant to measure basic beliefs (i.e., "How strongly do you believe that a life force is guiding us?"). Several items were taken from previously used scales, whereas three items were new additions that specifically sought to measure beliefs separate from any religious connotation. Those new items were "How spiritual of a person do you consider yourself to be?"; "Do you believe that there is a life force that surrounds everything and everyone?"; and "How strongly do you believe there is a life force guiding us?" Six of the eight items used a 4-point response scale and two items have 5-item response scales. In all cases, higher values indicate greater endorsement. Cronbach alpha for the spirituality scale was .87 and .80 in the low-risk and high-risk groups, respectively.

The scale was standardized owing to the differing number of response scale options included.

Health-as-a-Value (HAV). The original 4-item scale from Lau et al [17] read: (1) "If you do not have your health you don't have anything"; (2) "There are many things I care about more than my health"; (3) "Good health is only of minor importance in a happy life"; and (4) "There are few things more important than good health." The scale was rewritten to use simpler concepts and language while attempting to measure the same underlying construct. An attempt was made to keep the items similar to the wording used by Lau et al but was intended to be more understandable to high school students. The scale now reads: (1) "I am willing to make sacrifices to be healthy"; (2) "A big part of happiness is health"; (3) "Health isn't one of my big concerns"; and (4) "I would rather have fun than be healthy." The scale uses Likert-type response items, with a 4-item response format with anchors ranging from "not agree" (1) to "strongly agree" (4). Previous studies with high-risk youth that used the Lau et al wording achieved a Cronbach alpha of .62 [15]. The Cronbach alpha for the new items in both samples was .70.

Substance use in the lower risk group (comprehensive high school). In the lower risk sample, cigarettes, marijuana, and alcohol monthly use was assessed by asking: "During the past 30 days, on how many days did you do the following things?" with responses ranging from "0 days" to "All 30 days." Monthly use is an accepted standard for adolescent substance use. The responses were recoded into "use" and "no use" to aid in comparisons.

Substance use in the higher risk group (alternative high school). Monthly cigarettes, monthly alcohol, and monthly marijuana use were all assessed by asking participants to respond to "How often in the last 30 days have you used the following drugs?", with responses ranging from 0 to 100 times. The responses were recoded into "use" and "no use" to aid in comparisons across the two samples.

Demographic covariates. Several demographic variables were chosen to be included in the models because they have been shown to be associated with drug use in other studies. Age, ethnicity, and gender were entered into the models as covariates. Age was coded in years. A single item that asked participants to choose the one ethnic group with which they most identified, measured ethnicity.

Analysis

SAS software (SAS Institute Inc., Cary, NC, 1989) was used to perform all analyses. Descriptive statistics were obtained for both samples. Because drug use variables were skewed, and to aid in comparisons between the samples, all the substance use outcomes in both samples were dichotomized (0 = "no use" or 1 = "any use"). This recoding allows for comparisons across the two samples despite different wording of questions. Both scales, spirituality and HAV, were formed by summing the individual items. Cronbach alphas were obtained for both scales in both samples. Owing to varying response option length in the spirituality scale, the scale was standardized to a mean of "0" with a standard deviation of "1." Correlations between the independent variables and health-compromising behaviors were then calculated. To test the differences between the two samples, Chi-square analyses were performed. ANOVA was used to uncover any possible ethnic differences in spirituality and HAV. A Student's *t*-test was used to test for any gender differences. Logistic regression models were run on both samples. Age, gender, and ethnicity were controlled for in all the models. For ethnicity, dummy codes were created with "white" as a reference group. "Female" was used as the reference group when gender was included in a model. In the first round of analyses, only one independent variable was entered into the model, and tested on every outcome available in the sample. In the second set, both independent variables were included in the model and their predictive capability of all outcomes was tested.

Results

Sample Characteristics

Among those considered high risk, 382 students at the alternative high schools completed all items necessary for analyses; 44% were female. The mean age was 17 years. The sample was predominately Latino: 55.1% Latino, 17% white, 15% African-American, 2% Asian, and 16% "Other."

Two hundred and five students at the comprehensive high school, the lower risk sample, completed all items necessary. Sixty-four percent were female; with a mean age of 17 years. The sample was predominately Latino: 35% Latino, 11.3% white, 11% African-American, 27.3% Asian, 15.3% "Other."

The alternative high school students reported higher levels of use than the comprehensive high school students. Forty-seven percent of students re-

Table 1. Correlations Between the Independent Variables and Substance Use in Both Samples

	"Health-as-a-Value"		Spirituality	
	Lower Risk	Higher Risk	Lower Risk	Higher Risk
Monthly cigarettes	−.06	−.34***	−.17*	−.24***
Monthly alcohol	−.17	−.26***	−.19**	−.31***
Monthly marijuana	−.09	−.22***	−.12	−.18***

$* p < .05; ** p < .01; *** p < .001.$

ported monthly use of cigarettes, 62% reported monthly use of alcohol, and 50% reported monthly use of marijuana. In the lower risk group, 13% reported monthly use of cigarettes, 27% reported monthly use of alcohol and 7% reported monthly marijuana use.

Health-as-a-Value

The mean values for HAV were not significantly different between the two samples. Among the lower risk group, the mean value was 15 (SD = 2.95). Among the higher risk group, the mean value was 12.5 (SD = 2.89). The minimum value on the scale was 4, with a maximum value of 20. Correlations were first obtained regarding the relationship between HAV and substance use. The correlations are presented in Table 1. In the higher risk group, HAV was significantly negatively correlated with all types of measured substance use. Ethnic differences in HAV were explored and are presented in Figure 1. Significant differences were detected in the high risk group only (F = 4.99, $p < .001$). Asians were higher than Latinos, Whites, and the "other" ethnicity group.

Logistic regression was performed with several outcome variables to explore the predictive abilities

of the concepts when controlling for ethnicity, gender, and age. In the low-risk group, HAV was protective of monthly alcohol use (OR = 0.86; CI = 0.76−0.96).

The odds ratios in the high-risk group were all significant. The odds ratio for monthly cigarette use was .78 (CI = .72−.84), for monthly alcohol the odds ratio was .84 (CI = .78−.91), and the odds ratio for monthly marijuana use was .87 (CI = .81−.94).

Spirituality

The mean values on the spirituality scale were not significantly different between the two groups. Among the lower risk group, the mean value was 27.6 (SD = 7.60). Among the higher risk group, the alternative high school group, the mean value was 24.2 (SD = 6.05). The minimum value on the scale was 9, with a maximum value of 40. The scale was standardized for analyses with a resulting mean of "0" and standard deviation of "1." The correlations were then obtained regarding the relationship between spirituality and substance use. These correlations are presented in Table 1. In the lower risk sample, monthly cigarettes and alcohol use were both negatively correlated with spirituality. In the higher risk sample, spiritual beliefs were negatively correlated with all substances. Ethnic differences in spiritual beliefs were explored and are presented in Figure 2. No ethnic differences were reported in the low-risk sample. In the higher risk group ethnic differences were found (F = 5.54, $p < .001$). Asians were significantly higher than Latinos, Whites, and others.

Logistic regression was performed with the same outcome variables as was performed with HAV. Age, ethnicity, and gender were also controlled for in the analyses. In the low-risk sample, the odds ratio for monthly alcohol use was 0.94 (CI = .89−.98) and
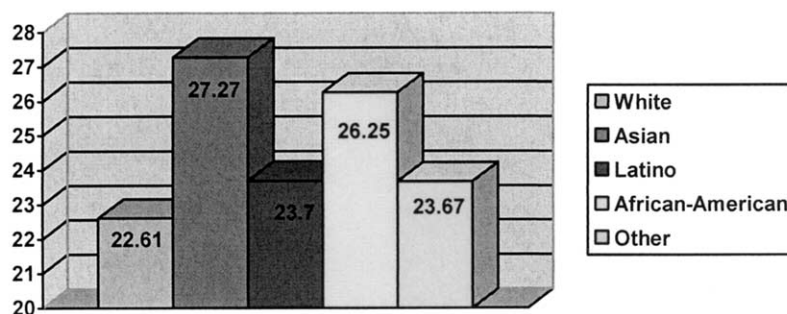
Figure 1. *Ethnic Differences in Spirituality in High-risk Group. Asian students have significantly higher levels than Latinos, Whites, and students that reported "other" as an ethnic category (p < .05).*
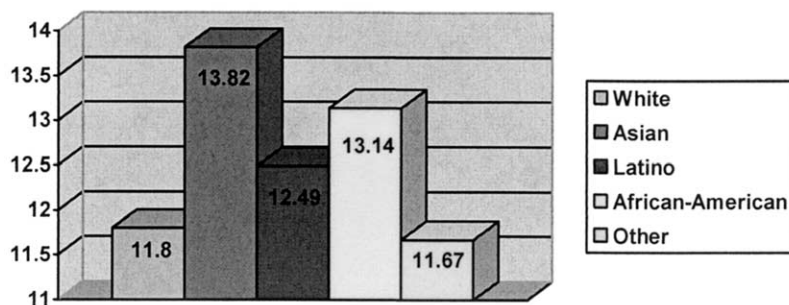
Figure 2. *Ethnic Differences in Heath-as-a-Value (HAV) in High-risk Group. Asian students have significantly higher levels than Latinos, Whites, and students that reported "other" as an ethnic category (p < .05).*

the odds ratios for monthly marijuana use was significant (OR = .87; CI = .80–.95). The odds ratios for monthly cigarettes use was not significant but was in the correct direction, less than 1.00. In the higher risk group, spirituality was significant for monthly cigarette use (OR = .92; CI = .89–.97), monthly alcohol use (OR = .88; CI = .84–.93), and monthly marijuana use (OR = .94; CI = .90–.98).

Health-as-a-Value and Spirituality in the Same Model

Spirituality and HAV were significantly correlated in both samples, but the interaction effect of the two was not a significant predictor of any of the substance use measures in either of the risk groups. In the higher risk sample, spirituality and HAV had a correlation coefficient of .28 ($p < .01$). In the low-risk sample, HAV and spirituality were correlated .16 ($p < .05$). Because the associations in both samples, although significant, are not highly correlated, both were entered into the same model. This was done to explore the independent effects of the variables.

All outcome measures were tested again with HAV and spirituality in the same model controlling for gender, ethnicity, and age. The odds ratios for monthly cigarette use for both samples are presented in Table 2. Table 3 lists the odds ratios for monthly alcohol use, and Table 4 contains the odds ratios for monthly marijuana use. Both spirituality and HAV were independently associated with a lower risk of monthly alcohol use in both samples. Monthly alcohol was also predicted by both independent variables in the higher risk sample. In terms of other outcomes, the results were stronger in the high-risk sample than in the lower risk sample. Spirituality was protective of cigarette and marijuana use, but HAV, when included in the model with spirituality, was not significantly protective.

In the higher risk group, both spirituality and HAV remained significant with all outcome measures. For monthly cigarette use, the odds ratio for spirituality was .95 (CI = .90–.99) and in the same

Table 2. Odds Ratios for Independent Variables in the Same Model in Both Samples Predicting Monthly Cigarette Use

	Lower Risk		Higher Risk	
	OR	(CI, 95%)	OR	(CI, 95%)
Age (years)	1.72	(.91, 3.23)	.91	(.68, 1.21)
Female	1.00	—	1.00	—
Male	2.34	(.91, 5.49)	1.66*	(1.04, 2.65)
White	1.00	—	1.00	—
African-American	.001	(.01, 999.9)	3.42**	(1.48, 7.89)
Asian-American	.63	(.17, 2.29)	1.61	(.80, 3.24)
Latinos	1.28	(.43, 3.79)	3.81	(.71, 20.52)
Other	1.36	(.23, 8.15)	1.67	(.67, 4.16)
Spirituality	.95	(.88, 1.01)	.95*	(.90, .99)
"Health-as-a-Value"	.87	(.77, .98)	.80***	(.73, .88)

    * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3. Odds Ratios for Independent Variables in the Same Model in Both Samples Predicting Monthly Alcohol Use

	Lower Risk		Higher Risk	
	OR	(CI, 95%)	OR	(CI, 95%)
Age (years)	.93	(.60, 1.44)	1.01	(.75, 1.37)
Female	1.00	—	1.00	—
Male	1.87	(.92, 3.81)	1.61	(.65, 2.56)
White	1.00	—	1.00	—
African-American	.30	(.07, 2.6)	2.70**	(1.18, 6.16)
Asian-American	.20**	(.07, .59)	2.1**	(1.12, 4.07)
Latinos	.92	(.40, 2.12)	3.73	(.65, 21.53)
Other	.96	(.24, 3.96)	.90	(.38, 2.16)
Spirituality	.95*	(.90, .99)	.90***	(.85, .94)
"Health-as-a-Value"	.87*	(.77, .98)	.91*	(.83, .99)

    * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4. Odds Ratios for Independent Variables in the Same Model in Both Samples Predicting Monthly Marijuana Use

	Lower Risk		Higher Risk	
	OR	(CI, 95%)	OR	(CI, 95%)
Age (years)	2.96*	(1.19, 7.37)	.97	(.74, 1.28)
Female	1.00	—	1.00	—
Male	1.42	(.43, 4.65)	1.46	(.94, 2.26)
White	1.00	—	1.00	—
African-American	2.68	(.36, 19.89)	1.6	(.75, 3.44)
Asian-American	1.14	(.20, 6.30)	1.12	(.60, 2.10)
Latinos	1.23	(.28, 5.42)	1.92	(.38, 9.60)
Other	1.13	(.08, 15.57)	.75	(.32, 1.71)
Spirituality	.88**	(.80, .96)	.95*	(.91, .99)
"Health-as-a-Value"	.90	(.73 1.10)	.91*	(.84, .99)

*p < .05; ** p < .01; ***p < .001.

model the odds ratio for HAV was .80 (CI = .73–.87). For monthly marijuana use, the odds ratio for spirituality was .95 (CI = .91–.99) and in the same model the odds ratio for HAV was .91 (CI = .84–.99).

Discussion

This research examined the relationship among HAV, spirituality, and various substance use behaviors. Importantly, we found both of these protective factors to be associated with lower levels of current monthly substance use. We found that each one had a direct independent effect on health behaviors. In addition, these protective factors were found to operate in both high- and low-risk adolescents, supporting the generalizability and strength of these findings. Both of these may become important elements of future prevention campaigns.

The refined measure of HAV had a reliability coefficient that exceeded earlier versions (new version alpha = .70, earlier versions = .62) [16]. Our measure of spirituality had an acceptable reliability coefficient and was predictive of tobacco use. This is only a step toward an adequate measure of this construct. Future studies should test several measures and compare reliability and validity of the measures. In addition, one may conjecture that spirituality is multidimensional, perhaps consisting of beliefs, practices, and experiences.

The higher risk sample had higher levels of substance use than the lower risk sample, and yet spiritual beliefs and a value placed on health did not differ between the two groups. Both HAV and spirituality were protective of substance use to some degree.

In the high-risk group, we found clear support for our hypotheses that HAV and spirituality are associated with lower levels of substance use. In the low-risk sample, we found evidence that HAV is protective against alcohol use in the last 30 days. Spirituality is protective of alcohol use and marijuana use in the lower risk group. When both spirituality and HAV were included in the same model, monthly alcohol use was significant in both groups. In the higher risk group, we found that both remain protective against all substances.

Although HAV and spirituality were correlated in the two groups, there was no significant interaction between them. When both spirituality and HAV were included in the same model, monthly alcohol use was significantly associated with both concepts in both groups. In the higher risk group, we found that both remained protective against all substances.

These findings extend beyond earlier work that looks at protective factors. We have found that spirituality and HAV are correlated with each other, and they each have independent contributions to predicting substance use. Therefore, one is not the confounder of the other, and one is not completely the mediator of the other. These results suggest that protective factors, although interrelated, can be uniquely important. Future studies examining positive characteristics (strengths, positive traits, etc.) need to further examine the independence of these relationships in longitudinal studies. Some people may argue that HAV is an element of spirituality, as spirituality oftentimes is overinclusive in definition.

Spirituality may have a buffering effect against stress. Spirituality is correlated with prosocial coping skills among adolescents, leading possibly to a reduction of health-compromising behaviors. Further work is needed to explore the mechanisms by which these two factors are influencing health behaviors. Does spirituality have a direct or indirect effect on drug use? Moderating/buffering effects of spirituality are certainly plausible and should be examined in future research. Wills' [22] work reported buffering effects of such items as seeking spiritual support. Spirituality may be related to mental health and through this mechanism be responsible for its protective influence [16].

Limitations

There are several limitations to this current study. This spirituality scale has not been validated, and has traditionally been shown to be very difficult to measure. In addition, this version of HAV scale has

not been validated against the earlier version used by Lau et al in 1986 [17]. The measures of use differed in their wording in the surveys. Although we standardized the measures by recoding into "use" vs. "no-use" categories, one wording may be more sensitive than the other. This was a cross-sectional study, so no causal assertions can be made. The way ethnicity was coded is not sensitive enough to the cultural influences of multiethnic individuals. Participants were asked to choose only one ethnic group, and some participants may identify with more than one ethnic group. There is also a possible self-report bias.

Several potential confounders were not included in the study, such as family dysfunction. Socioeconomic status is an important confounder that was not included in analyses, but is extremely difficult to measure among adolescents. Future studies should include more confounders.

An additional limitation is that we did not assess religious affiliation or practices. Future studies may choose to explore the differences between religiosity and spirituality.

Conclusion

This study showed that both spirituality and "Health-as-a-Value" may be protective against substance use among high-risk adolescents as well as low-risk adolescents. In addition, the protective effects appeared to be stronger in the high-risk sample, although this may have been owing to the greater variance in substance use in the high-risk sample. Regardless, a focus on protective factors may indeed be a fruitful area for future research on high-risk youth.

References

1. Kann L, Kinchen SA, Williams BI, et al. Youth risk behavior surveillance —United States, 1999. MMWR CDC Surveill Summ 2000;49:1–32.
2. Kann L, Kinchen SA, Williams BI, et al. Youth risk behavior surveillance-United States, 1997. MMWR CDC Surveill Summ 1998;47:1–89.
3. Seligman MEP, Csikszentmihalyi M. Positive psychology: An introduction. Am Psychol 2000;55:5–14.
4. Levenson MR. Risk taking and personality. J Pers Soc Psychol 1990;58:1073–80.
5. Simon TR, Stacy AW, Sussman S, Dent CW. Sensation seeking and drug use among high risk Latino and Anglo adolescents. Pers Individ Dif 1990;17:1083–90.
6. Kass JD, Friedman R, Leserman J, et al. An inventory of positive psychological attitudes with potential relevance to health outcomes: Validation and preliminary testing. Behav Med 1991;17:121–9.
7. Redeker NS, Smeltzer SC, Kirkpatrick J, Parchment S. Risk factors of adolescent and young adult trauma victims. Am J Crit Care 1995;4:370–8.
8. Miller W. Researching the spiritual dimensions of alcohol and other drug problems. Addiction 1998;93:979–90.
9. Sussman S, Brannon BR, Dent CW, et al. Relations of coping effort, coping strategies, perceived stress, and cigarette smoking among adolescents. Int J Addict 1993;28:599–612.
10. Gorsuch RL. Religious aspects of substance abuse and recovery. J Soc Issues 1995;5:65–83.
11. Larson DB, Swyers JP, McCullough ME (eds). Scientific Research on Spirituality and Health: A Consensus Report. Rockville, MD: National Institute for Healthcare Research, 1998.
12. Francis LJ, Mullen K. Religiosity and attitudes towards drug use among 13–15 year olds in England. Addiction 1993;88:665–72.
13. 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.
14. Miller L, Davies M, Greenwald S. Religiosity and substance use among adolescents in the national comorbidity survey. J Am Acad Child Adolesc Psychiatry 2000;39:1190–7.
15. Zimmerman MA, Maton KI. Life-style and substance use among male African-American urban adolescents: A cluster analytic approach. Am J Community Psychol 1992;20:121–38.
16. Hackerman AE, King P. Adolescent spirituality: A foundation for recovery from drug dependency. Alcohol Treat Q 1998;16:89–99.
17. Lau RR, Hartman KA, Ware JE Jr. Health as a value: Methodological and theoretical considerations. Health Psychol 1986;5:25–43.
18. Sussman S, Nezami E, Mishra S. An operational definition of spiritual experience relevant to health promotion efforts. Altern Ther Clin Pract 1997;4:120–6.
19. Krsitiansen C. Smoking, health behavior, and value priorities. Addict Behav 1985;10:41–4.
20. Wurtele SK, Britcher JC, Saslawsky DA. Relationships between locus of control, health value and preventive health behaviors among women. J Res Pers 1985;19:271–8.
21. Weiss GL, Larsen DL, Baker WK. The development of health protective behaviors among college students. J Behav Med 1996;19:143–61.
22. Wills TA, Sandy JM, Yaeger A, Shinar O. Family risk factors and adolescent substance use: Moderation effects for temperament dimensions. Dev Psychol 2001;37:283–97.