Factors Associated With the Psychological Well-Being and Distress of University Students

Jessica L. Burris, MA; Emily H. Brechting, MS; John Salsman, PhD; Charles R. Carlson, PhD

Abstract. Objective: Because of the serious nature of psychiatric illness and related problems, the authors attempted to identify demographic, individual, and behavioral factors linked to university students' psychological health. **Participants**: They surveyed 353 (60.9% female) predominately Caucasian (88.7%) university students attending a large public university. **Methods**: The authors used a self-report questionnaire including valid and reliable psychometric instruments for all study variables. They conducted multiple regression analyses to examine associations among study variables using a cross-sectional design. **Results**: More favorable health states (ie, greater psychological well-being and less distress) were positively associated with optimism, health values, and religiousness and were negatively associated with spirituality and number of sexual partners. **Conclusions**: Results demonstrated that multiple protective and risk factors contribute to the psychological well-being and distress of university students. Health promotion practitioners should adopt strategies that strengthen the personality characteristics and values associated with university students' psychological health.

Keywords: college health, health-as-a-value, religiousness, sexual practices, spirituality.

The transition from childhood to adulthood, often marked by beginning college, may be a particularly stressful time. College and university students experience stressors that may contribute to the development of problems ranging from concentration difficulty, fatigue, and anxiety to suicidality, eating disorders, and other psychiatric illnesses.[1–4] Unfortunately, the onset of psychological distress often disrupts the completion of normal developmental and educational tasks that many young adults encounter.[1]

***Ms Burris**, **Ms Brechting**, and **Dr Carlson** are with the Department of Psychology at the University of Kentucky in Lexington. **Dr Salsman** is with the Center on Outcomes, Research, and Education at NorthShore University Health System in Chicago, IL.*

Because of the serious nature of psychiatric illness and related problems in university student populations, further examination of positive and negative factors related to students' psychological health is needed. Specifically, an examination of demographic, individual (eg, personality, values), and behavioral variables associated with university students' psychological health is warranted to develop effective interventions for this population. Although some variables by their nature either cannot be altered (eg, race) or are highly resistant to change (eg, personality), awareness of their influence can guide treatment planning and increase its effectiveness. For example, some interventions may be more effective if tailored to certain demographics (eg, ethnic minorities or "at risk" youth) as opposed to being implemented at the schoolwide level. Knowing the characteristics of students who are likely experiencing psychological distress is a necessary first step for developing such interventions.

Demographic Variables

Although many researchers have examined the associations between psychological health and various demographic factors—including age, sex, socioeconomic status, and ethnicity—in the general population, there is a paucity of research involving these issues among university students. Vaez and Laflamme,[4] who conducted 1 of few such studies, found that female university students were significantly more likely than their male counterparts to report seeking and receiving care for psychological problems. Similarly, Piko[5] found that female college students reported greater psychosomatic symptomology, reduced psychological well-being, and reduced perceived health status compared with male students. In regard to racial differences, a nationally representative study found that students describing themselves as Native American, Alaskan Native, black or Latino reported experiencing almost twice as many mentally unhealthy days than did students describing themselves

as white or Asian/Pacific Islander.[6] Beyond these results, little is known about the relationship between demographic factors and university students' psychological health.

Individual Difference Variables

Health-as-a-Value

"HAV [Health-as-a-value] is the concept that the more people value their health, the more likely they are to refrain from health-compromising behaviors."[7(p193)] Although not traditionally conceptualized as a personality characteristic, HAV is a stable and enduring characteristic that significantly influences an individual's behavioral choices. In longitudinal and cross-sectional studies, HAV has been associated with reduced use rates of alcohol, marijuana, and nicotine, even when controlling for age, ethnicity, and sex.[7,8] In college-aged samples, HAV has been associated with health-promoting behaviors such as alcohol avoidance and physical activity.[9] Given its protective quality for physical health, HAV may also demonstrate a positive relationship with university students' psychological health.

Optimism

Dispositional optimism has been defined as "the tendency to believe that one will generally experience good versus bad outcomes in life."[10(pp202,203)] Thus it is not difficult to imagine that optimists are generally happier and have better psychological health than do pessimists. According to Scheier and Carver's review of longitudinal and prospective research,[10] optimism is negatively associated with depression, psychological distress, hostility, loneliness, and hopelessness and demonstrates a positive association with feelings of relief, happiness, perceived social support, and quality of life. Researchers[11,12] have recently found that optimism is inversely associated with depression, paranoid hostility, anger, and cognitive avoidance and positively associated with life satisfaction, adaptive coping, and health-promoting behaviors. Taken collectively, research strongly supports optimism's impact on the psychological health of youth and adult populations.

Religiousness and Spirituality

In recent conceptualizations of religiousness and spirituality, researchers acknowledge the overlap between the constructs, while respecting each construct's variance.[13] In general, *religiousness* is the extent of an individual's participation in the institutionally sanctioned beliefs and practices of a faith group,[14] whereas *spirituality* is the experiences and feelings associated with a search for connection with the transcendent.[13] Considering these definitions, it should be evident that religiousness and spirituality are not at odds with each other. Despite this, the constructs should not be collapsed, as a person may be spiritual and not religious, and vice versa.[13,15] When examining the independent and combined influence of religiousness and spirituality on physical and psychological health, both constructs have demonstrated largely favorable relationships.[16–19] For example, findings of improved longevity and lower mortality among persons describing themselves as religious are often mediated by gains in mental health correlates, such as improved social relationships and coping ability.[18] Although some researchers have found negative associations, salutary effects for religiousness and spirituality far outweigh the reported negative effects.[18]

Behavioral Variables

Alcohol Use

Across national cross-sectional and longitudinal studies, only a minority of college and university students abstain from alcohol, whereas many more are binge drinkers.[6,20,21] Given the rates of heavy alcohol use on college and university campuses, psychosocial outcomes associated with drinking are important areas of research. To date, researchers examining the link between young adults' alcohol use and psychological health have found mixed results. Murphy et al[20] found significant differences among female college students, such that moderate and heavy drinkers reported lower levels of life satisfaction than did abstainers. However, in a longitudinal study of more than 13,000 young adults,[21] the frequency of depressive symptoms were similar among moderate drinkers and abstainers once researchers adjusted for health and sociodemographic factors. Heavy drinkers, however, had the (significantly) highest frequency of depressive symptoms relative to all other participants. Thus, although alcohol use is associated with adverse short-term consequences and risk taking, the global impact of drinking on students' psychological health remains unclear.[20]

Sexual Behavior

Although there is no consensus on how best to define risky sexual behavior (RSB), empirical evidence supports a 3-dimensional structure that includes higher numbers of sexual partners, higher frequencies of sexual activity, and lower frequencies of condom use.[22] There is considerable evidence that these behaviors correlate with negative physical health outcomes such as disease acquisition,[23] but little attention is given to the implications of RSB on psychological health. To our knowledge, only 2 studies have examined this relationship. Among a large sample of adolescents, Valois et al[24] found that participants reporting greater RSB had significantly increased odds of greater life dissatisfaction compared with adolescents reporting less RSB. Until recently, little was known about whether these results generalized to other student populations. Considering findings from a large (N = 12,835) nationally representative study of the health-related quality of life of secondary and higher education students,[6] it appears that RSB is negatively correlated with measures of quality of life and psychological health.

Present Study

Our aim in the present study was to identify demographic, individual, and behavioral factors that exhibit strong associations with university students' psychological health. To achieve the greatest specificity, we decided to assess both positive (well-being) and negative (distress) outcomes. We

chose independent variables on the basis of perceived gaps in the literature. Although most of these variables have repeatedly demonstrated importance in understanding university students' and other young adults' physical health status (eg, RSB, HAV), few, if any, researchers have examined their independent or combined influence on psychological health. Furthermore, we designed the current study to better determine the nature and strength of some relations that have demonstrated conflicting relations (eg, association between alcohol use and psychological health). Thus, we hoped that a study integrating demographic, individual, and behavioral predictors might contribute significantly to the literature.

On the basis of previous research findings, we hypothesized each predictor to function as either a protective or risk factor for more favorable health states (ie, lower psychological distress and greater psychological well-being). Thus, we hypothesized that participants' endorsement of HAV, optimism, religiousness, and spirituality would be associated with more favorable outcomes, whereas reporting greater levels of alcohol use and RSB would be associated with more negative outcomes. We made no directional hypotheses regarding demographic variables.

METHODS

Participants

A sample ($N = 353$) of young adults attending a large public university participated in this study during fall 2005 and spring 2006. More than half (61%, $n = 215$) were female. Participants ranged in age from 17 to 29 years ($M = 19.8$, $SD = 1.31$). Most (88.7%) were Caucasian ($n = 313$), 7.1% were African American ($n = 25$), 1.4% were Asian American ($n = 5$), 0.6% were Latino ($n = 2$), 1.7% reported other racial backgrounds ($n = 6$), and 0.3% did not respond to this item ($n = 1$). All participants reported being heterosexual.

Procedure

We recruited participants for this self-report questionnaire study through undergraduate psychology courses. Course instructors announced the study in class and gave participants extra credit toward their coursework for completion. To guard against coercion, students were provided an alternative extra credit assignment if they declined study participation. The University of Kentucky Institutional Review Board approved all study procedures. All participants signed informed consent forms, and we kept questionnaires anonymous.

Measures

Demographic Variables

We assessed all demographic variables (age, racial background, sexual orientation, and sex) using single items, which allowed participants to choose from a variety of response options.

Health-as-a-Value

The HAV scale provides an index of the extent to which a person considers health to be an integral part of his or her happiness.[9] Research supports the construct validity of this scale, with higher scores corresponding positively with participation in health-promoting behaviors such as exercise and abstinence from alcohol.[5,7,8] The 8-item scale is scored using a 4-point continuum ranging from 1 (*do not agree*) to 4 (*strongly agree*). Sample item: "If you do not have your health, you don't have anything." Cronbach's alpha for the present sample was .72.

Optimism

We used the Life Orientation Test–Revised (LOT-R) to assess optimism.[25] The LOT-R has been used extensively in empirical research and has demonstrated adequate convergent, discriminant, and construct validity.[10,25] The 10-item scale (4 filler items) assesses generalized expectancies for positive versus negative outcomes. Participants indicate to what extent they agree with each item on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample item: "In uncertain times, I usually expect the best." Cronbach's alpha for the present sample was .84.

Religiousness

We assessed religiousness using the Religious Commitment Inventory-10 (RCI-10), which measures "the degree to which a person adheres to his or her religious values, beliefs, and practices, and uses them in daily living."[26(p85)] Validation testing strongly supports RCI-10's validity.[26] Response options range from 1 (*not at all true*) to 5 (*totally true*). Sample item: "My religious beliefs lie behind my whole approach to life." Cronbach's alpha for the present sample was .96.

Spirituality

Spiritual transcendence emphasizes a "personal search for connection with a larger sacredness" and has been theorized as the sixth factor of personality.[27(p988)] The short form of the Spiritual Transcendence Scale (STS) "provides an overall index of an individual's level of commitment to intangible realities and the degree of emotional support experienced in return."[27(p989)] The STS provides scores for the total scale and 3 subscales: Connectedness, Universality, and Prayer Fulfillment. The STS has demonstrated construct, convergent, and discriminant validity.[28] Sample item: "In the quiet of my prayers and/or meditations, I find a sense of wholeness." Response options range from 1 (*strongly disagree*) to 5 (*strongly agree*). In the present sample, Cronbach's alpha for the total scale was .79, which is consistent with research on the longer parent scale ($\alpha = .80$).[27]

Alcohol Use

We assessed alcohol use with 3 questions. We assessed frequency of alcohol use with the following question: "In the last year, how often did you drink alcohol on the average?" Response options ranged from 0 (*I didn't drink any alcohol*) to 17 (*4 or more times a day*). We assessed quantity of alcohol use with the following question: "In the last year, when you drank alcohol, how many drinks did you con-

sume, on the average, on one occasion?" Response options ranged from 0 (*I didn't drink any alcohol*) to 13 (*more than 25 drinks*). Last, we assessed frequency of intoxication with the following question: "In the last year, how many times have you gotten drunk or 'very high' on alcohol?" Response options ranged from 0 (*I didn't drink any alcohol*) to 17 (*4 or more times a day*). Participants were asked to consider each question carefully and mark only 1 response. Thus, an individual who scored a 3 on alcohol use, 3 on quantity, and 1 on intoxication is best described by the following statement: "In the last year, I drank alcohol once every 3 months, had 3 drinks per occasion, and was intoxicated or 'very high' once." Because the 3 items measuring alcohol use correlated strongly ($r = .91$), we summed participants' scores on each of the 3 items; this number constituted their total alcohol use score.

Sexual Behavior

We assessed sexual behavior with 2 single-item questions that tapped participants' frequency of condom use, number of sexual partners, and frequency of vaginal sex. When asked about their current number of sexual partners, participants were to consider both vaginal and oral sex: "How many sexual partners do you currently have?" Response options ranged from 0 (*none*) to 5 (*5 or more*). To measure the frequency of vaginal sex and condom use, participants were asked, "In the past month, how many times have you done each of the following? (a) had vaginal sex with a condom and (b) had vaginal sex without a condom?" Response options ranged from 0 (*none*) to 6 (*13 or more times*).

Psychological Health

We measured psychological health with the RAND Health Insurance Study Mental Health Inventory (MHI).[29] The MHI provides a balanced assessment of both positive and negative valences of key psychological constructs, including anxiety, depression, loss of behavioral or emotional control, and general positive affect. The factor structure of the MHI, which includes a Psychological Well-Being versus Psychological Distress factor, has shown stability across 4 populations.[30] In addition, the construct validity of the MHI is strongly supported, with cross-sectional analyses showing strong links in the hypothesized direction between MHI scores and a wide range of variables including stressful life events, social support, physical illness, and life satisfaction.[29–31]

We used the 17-item version of the MHI (the MHI II), which is a short-form for the longer parent scale. On this scale, participants respond to test items in a manner consistent with their emotions, mood, attitude, and behavior during the past 4 weeks. Sample items include: "Has your life been full of things that were interesting to you?" "Have you felt so down in the dumps that nothing could cheer you up?" "Have you felt restless, fidgety or impatient?" Responses were scored using a 6-point continuum ranging from 1 (*all of the time*) to 6 (*none of the time*). The method of scoring the MHI involves 5 steps: (a) data cleaning, (b) item recalibration and skip pattern recoding, (c) reverse scoring of some items, (d) transforming item scores linearly to a common metric with a possible range of 0 to 100, and (e) averaging across items in the same scale. Therefore, the final output for both the Psychological Well-Being and Psychological Distress scale scores may range from 0 (*negative health state*) to 100 (*positive health state*). Cronbach's alphas for the present sample were .82 and .83 for the Psychological Well-Being and Psychological Distress factors, respectively.

Analyses

Correlational Analyses

We first conducted bivariate correlations in assessing the relationship between the independent and dependent variables. To guard against type I error, we adopted a stringent criterion ($p < .01$) to determine statistical significance. If a predictor demonstrated a statistically significant association with participants' psychological well-being or distress scores, we included it in the regression model.

Regression Analyses

We conducted multiple regression analyses to ascertain the unique contribution of each predictor to the total variance in the dependent variables. We entered all variables that met criteria for inclusion in the regression model in the same step. We considered both the semipartial (*sr*) for each predictor, as well as the overall amount of variance (R^2) accounted for by the model.

RESULTS

Descriptives

Table 1 shows the means and standard deviations for all variables. On average, participants reported moderate levels of optimism, health values, and religiousness and a relatively high level of spirituality. Average scores on the alcohol use measures corresponded to drinking alcohol twice per month, having 5 alcoholic beverages per occasion, and being intoxicated once per month. Average scores on the measures of sexual behaviors corresponded to having 1 sexual partner, having vaginal sex 2 to 3 times per month, and having vaginal sex without a condom once per month.

Correlational Analyses

As seen in Table 2, most bivariate correlations were in the hypothesized direction. Although none of the demographic variables measured in the present study (age, sex, race) were significantly associated with psychological health, all individual difference variables (HAV, optimism, religiousness, spirituality) demonstrated strong and positive associations (median $r = .155$, $p < .01$) with more favorable health states. For the behavioral variables of interest (alcohol use and sexual behavior), only 1 association reached statistical significance ($p < .01$). Namely, current number of sexual partners was positively associated with the experience of psychological distress in the present sample of university students. Given these results, we included as predictors only

TABLE 1. Descriptive Statistics

Variable	*M*	*SD*
Demographic		
Female	215.0	60.0
Caucasian	313.0	88.7
Age (y)	19.8	1.3
Individual difference		
Health-as-a-value	16.6	3.3
Optimism	21.3	4.0
Religiousness	25.8	10.9
Spirituality	32.6	5.8
Behavioral		
Frequency of alcohol use	5.9	3.5[a]
Frequency of intoxication	4.9	3.5[b]
Quantity of alcohol use	4.8	2.9[c]
Total alcohol use score	15.8	9.2
Frequency of sex	2.4	3.0[d]
Frequency of sex without a condom	1.1	2.0[e]
Current number of sexual partners	0.6	0.1[f]
Dependent		
Psychological well-being	67.2	16.8
Psychological distress	66.3	12.9

Note. Data reported for sex and race are cases and percentages. [a,b,c]correspond to drinking twice per month, having 5 alcoholic beverages per occasion, and being intoxicated once per month; [d,e,f]correspond to having only 1 sexual partner, having vaginal sex 2–3 times per month, and having vaginal sex without a condom once per month.

HAV, optimism, religiousness, spirituality, and number of sexual partners in the regression model.

Regression Analyses

To test for the unique and combined contribution of the previously mentioned predictors, we performed multiple regression analyses for the Psychological Well-Being and Psychological Distress scale scores (see Table 3). Both regression models had significant predictive power: Psychological Well-Being, $R^2 = 40.3\%$, $F(5, 252) = 33.50$, $p < .001$, and Psychological Distress, $R^2 = 42.6\%$, $F(5, 251) = 35.76$, $p < .001$.

In predicting participants' psychological well-being, only optimism ($sr = .57$, $p < .01$) and HAV ($sr = .16$, $p < .01$) were significant predictors. In contrast, all variables significantly contributed to predicting participants' psychological distress. Optimism provided the largest unique contribution ($sr = .58$, $p < .01$), followed by spirituality ($sr = –.23$, $p < .01$), current number of sexual partners ($sr = –.14$, $p < .01$), religiousness ($sr = .13$, $p < .01$), and HAV ($sr = .09$, $p < .05$). All relationships were in the hypothesized direction with 1 notable exception. Because higher scores on the Psychological Distress scale indicate more favorable health (because of the reverse scoring process), the negative association between spirituality and psychological distress indicates that spirituality is positively associated with distress.

TABLE 2. Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	—												
2. Sex	–.036[b]	—											
3. Race	.009[b]	.137[a]	—										
4. Health-as-a-value	.049	.031[b]	–.114[b]	—									
5. Optimism	–.013	.056[b]	–.040[b]	.175*	—								
6. Religiousness	–.031	.200[b]*	–.146[b]*	.049	.169*	—							
7. Spirituality	.036	.282[b]*	–.043[b]	.184*	.200*	.535*	—						
8. Alcohol use (total score)	.011	–.213[b]*	.148[b]*	–.088	–.111*	–.515*	–.200*	—					
9. Frequency of sex	.007	.157[b]*	–.039[b]	.088	–.004	–.211*	–.033	.212*	—				
10. Current number of sexual partners	.200*	–.093[b]	–.004[b]	.126*	–.028	–.307*	–.077	.247*	.440*	—			
11. Frequency of sex without a condom	.065	.176[b]*	–.041[b]	.051	–.008	–.123*	.104	.207*	.756*	.299*	—		
12. Psychological well-being	–.050	.012[b]	–.054[b]	.245*	.608*	.125*	.135*	–.076	.071	.000	–.032	—	
13. Psychological distress	–.093	–.020[b]	–.066[b]	.118*	.587*	.176*	–.016	–.073	.008	–.132*	–.030	.603*	—

Note. Higher scores on the psychological well-being and distress scales indicate more favorable heath states.
[a]phi coefficient.
[b]point biserial coefficient.
*$p < .01$.

TABLE 3. Regression Analyses

Variable	*sr*	*p*	Total R^2
Psychological well-being			
Health-as-a-value	.17	.00	
Optimism	.57	.00	
Religiousness	.05	.16	
Spirituality	–.06	.13	
Current number of sexual partners	–.01	.41	.40
Psychological distress			
Health-as-a-value	.09	.03	
Optimism	.58	.00	
Religiousness	.13	.00	
Spirituality	–.23	.00	
Current number of sexual partners	–.14	.00	.43

This is in marked contrast to the nature of the association between religiousness and psychological distress, which was positive (ie, greater religiousness associated with less distress). Therefore, religiousness and spirituality apparently demonstrated unique relationships with the experience of psychological distress among the present sample.

COMMENT

Recognizing the importance of examining factors associated with university students' psychological health, we measured demographic, individual, and behavioral variables that we hypothesized would be associated with the psychological well-being and distress of a large sample of university students. Four major findings emerged from this cross-sectional investigation. First, optimism was the best predictor of both psychological well-being and lower levels of psychological distress. In university students, having an optimistic attitude likely encourages the perseverance necessary for success in an academic setting, which may positively affect an individual's psychological health. Therefore, preventive interventions fostering optimistic explanatory styles, such as certain cognitive–behavioral therapies for depression and anxiety, may be useful for university students.[32]

Second, results support extending the protective quality of HAV beyond physical health. In previous research, HAV has been associated with physical health-promoting behaviors, such as exercise and abstinence from alcohol, marijuana, and nicotine.[7–9] To our knowledge, we are the first to examine the link between HAV and psychological health; consistent with a priori hypotheses, we found that the association was positive. Understandably, valuing one's health likely generates an interest in engaging in behaviors that promote and prevent psychological well-being and distress, respectively. With this knowledge, college administrators and health practitioners should give more attention to helping young adults develop beliefs consistent with health-promoting, as opposed to health-compromising, behaviors.

Third, religiousness and spirituality demonstrated unique and meaningfully different associations with participants' psychological health. Although neither variable was significantly predictive of students' psychological well-being, both variables were significantly related to psychological distress. Religiousness was inversely associated with distress, whereas spirituality was positively associated with distress. Although these results lend themselves to the interpretation that students under distress turn to spirituality to cope, this interpretation has limited support because the same association would have also been expected for religiousness, especially because religiousness has been documented as a coping mechanism.[33,34] As ours was 1 of few studies examining spirituality's unique association with psychological health, care should be taken in interpreting study findings. However, further understanding of these findings may be drawn from a similar study.[35]

Although Piedmont et al[35] found that religious crises at baseline predicted Axis II (personality) dysfunction at follow-up, spirituality did not demonstrate significant predictive utility. It should be appreciated that Piedmont et al's study sample was similar to ours and that both studies used the same spirituality measure. Therefore, discussion of the differences between the 2 studies might shed light on how to best interpret the current findings. First, we did not include an explicit measure of the negative influences of religiousness (eg, conflicts with God or one's faith community), and this omission might account for the negative association between religiousness and distress. Second, we included a measure of global psychological health, whereas Piedmont et al examined personality functioning explicitly. Thus, one's connection to the transcendent—and any perceived difficulties or conflicts with that relationship—may generally impact one's experience of psychological distress but not personality functioning specifically. In summary, problems in one's relationship with the transcendent and crises of faith appear to have important implications for one's psychological health. Therefore, low-cost psychospiritual interventions that can be used with university students are worthy of serious consideration.[36]

Fourth, our results suggest that university students having vaginal intercourse with multiple partners experience great-

er psychological distress than do those currently abstaining from sex or having 1 sexual partner. Although students with multiple sex partners may experience greater distress associated with a perceived (and actual) risk for disease acquisition or unwanted pregnancy,[23,37] students experiencing distress may use sexual promiscuity as a coping mechanism.[38] Our results also lend themselves to the interpretation that students with 1 sexual partner have a more committed and intimate relationship, which protects against distress. Because of the limited amount of previous research[6,24] and our study's design, the exact nature and direction of the association cannot be stated definitively and conclusions should be carefully drawn.

Some limitations of the present study deserve comment. None of the demographic variables (age, sex, race) demonstrated significant associations with participants' psychological health. Although significant and clinically relevant relationships may not exist, these findings could be the result of restriction of range in the sample. In fact, because participants were predominately female Caucasian students recruited from 1 university located in the southeastern region of the United States, little is still known about the psychological health of racial and ethnic minority students, as well as students from other regions of the country. Because of restrictions in age, racial background, sexual orientation, and geographic location, generalization to college and university students at large is limited. Another limitation is that we did not assess for all aspects of participants' sexual practices as they related to oral sex. This limitation precludes any statements about whether university students' participation in oral sex is associated with psychological health. Last, despite the observed relationships being largely congruent with a priori hypotheses, the cross-sectional design precludes statements of causality. Until longitudinal study data are available, the causal relationship between university students' psychological health and their sexual behavior will remain unclear. Similarly, the direction of the link between psychological health and other study variables will be unresolved until additional research is conducted.

To increase our knowledge base, some research programs have attempted to document the health status of students over time and across convenience samples. For example, the American College Health Association–National College Health Assessment (ACHA–NCHA) provides information about students' health status, health problems, risk-taking behaviors, health-promoting behaviors, impediments to academic performance, and access to health care.[39] Although research of this type (ie, nationally representative studies) is important and worthy of continued investment, it may be the exception and not the rule. In other words, the rate at which research programs engage in nationally representative studies is still few and far between. Briefly stated, additional work of this nature and quality must be accomplished. Furthermore, to better capture the pattern and trajectory of university students' psychological health, longitudinal research that involves large samples of racially and ethnically diverse populations continues to be of vital importance and is strongly recommended. Other recommendations include incorporating study participants from various education programs and classrooms, as opposed to relying primarily on students in introductory psychology classes. Last, when one considers our results, it appears that concurrent assessment of psychological well-being and distress is needed to fully understand university students' psychological health status.

NOTE

For comments and further information, address correspondence to Dr Charles R. Carlson, University of Kentucky, Psychology Department, 106B Kastle Hall, Lexington, KY 40506-0044, USA (e-mail: ccarl@uky.edu).

REFERENCES

1. Becker M, Martin L, Wajeeh E, Ward J, Shern D. Students with mental illness in a university setting: faculty and student attitudes, beliefs, knowledge, and experiences. *Psychiatr Rehabil J.* 2002;25:359–368.

2. Duane E, Stewart C, Bridgeland WM. College student suicidality and family issues. *Coll Stud J.* 2003;37:135–141.

3. Kugu N, Akyuz G, Dogan O, Ersan E, Izgic F. The prevalence of eating disorders among university students and the relationship with some individual characteristics. *Aust N Z J Psychiatry.* 2006;40:129–135.

4. Vaez M, Laflamme L. First-year university students' health status and socio-demographic determinants of their self-rated health. *Work*. 2002;19:71–80.

5. Piko B. Health-related predictors of self-perceived health in a student population: the importance of physical activity. *J Community Health.* 2000;25:125–137.

6. Zahran HS, Zack MM, Vernon-Smiley ME, Hertz MF. Health-related quality of life and behaviors risk to health among adults aged 18–24 years in secondary or higher education—United States, 2003–2005. *J Adolesc Health*. 2007;41:389–397.

7. Ritt-Olson A, Milam J, Unger J, 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.

8. Reifman A, Barnes GM, Dintcheff BA, Uhteg L, Farrell MP. Health values buffer social–environmental risks for adolescent alcohol misuse. *Psychol Addict Behav.* 2001;15:249–251.

9. Lau RR, Hartman KA, Ware JE. Health as a value: methodological and theoretical considerations. *Health Psychol.* 1996;5:25–43.

10. Scheier MF, Carver CS. Effects of optimism on psychological and physical well-being: theoretical overview and empirical update. *Cognit Therap Res*. 1992;16:201–228.

11. Mulkana SS, Hailey BJ. The role of optimism in health-enhancing behavior. *Am J Health Behav.* 2001;25:388–395.

12. Puskar KR, Sereika SM, Lamb J, Tusaie-Mumford K, McGuinness T. Optimism and its relationship to depression, coping, anger and life events in rural adolescents. *Issues Ment Health Nurs.* 1999;20:115–130.

13. Zinnbauer BJ, Pargament KI, Scott AB. The emerging meanings of religiousness and spirituality: problems and prospects. *J Pers.* 1999;67:889–919.

14. Peterman AH, Fitchett G, Brady MJ, Hernandez L, Cella D. Measuring spiritual well-being in people with cancer: the functional assessment of chronic illness therapy, spiritual well-being scale (FACIT-Sp). *Ann Behav Med.* 2002;24:49–58.

15. Saucier G, Skrypinska K. Spiritual but not religious? Evidence for two independent dispositions. *J Pers.* 2006;14:1257–1292.

16. Seybold KS, Hill PC. The role of religion and spirituality in mental and physical health. *Curr Dir Psychol Sci.* 2001;10:21–24.

17. Hackney CH, Sanders GS. Religiosity and mental health: a meta-analysis of recent studies. *J Sci Stud Religion.* 2003;42:43–55.

18. Koenig HG. Religion and medicine II: religion, mental health and related behaviors. *Int J Psychiatry Med.* 2001;31:97–109.

19. Oman D, Thoresen CE. Do religion and spirituality influence health? In: Paloutzian RF, Park CL, eds. *Handbook of the Psychology of Religion and Spirituality.* New York, NY: Guilford Press; 2005:435–459.

20. Murphy JG, McDevitt-Murphy ME, Barnett NP. Drink and be merry? Gender, life satisfaction, and alcohol consumption among college students. *Psychol Addict Behav.* 2005;19:184–191.

21. Paschall MJ, Freisthier B, Lipton RI. Moderate alcohol use and depression in young adults: findings from a national longitudinal study. *Am J Public Health.* 2005;95:453–457.

22. Beadnell B, Morrison DM, Wilsdon A, et al. Condom use, frequency of sex and number of partners: multidimensional characterization of adolescent sexual risk-taking. *J Sex Res*. 2005;42:192–202.

23. Centers for Disease Control and Prevention. *Sexual risk behaviors.* National Center for Chronic Disease Prevention and Health Promotion. http://www.cdc.gov/HealthyYouth/sexualbehaviors/index.htm. Accessed May 1, 2007.

24. Valois RF, Zullig KJ, Huebner ES, Kammermann SK, Drane JW. Association between life satisfaction and sexual risk-taking behaviors among adolescents. *J Child Fam Stud.* 2002;11:427–440.

25. Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *J Pers Soc Psychol.* 1994;67:1063–1078.

26. Worthington EL, Wade NG, Hight TL, et al. The Religious Commitment Inventory-10: development, refinement, and validation of a brief scale for research and counseling. *J Couns Psychol.* 2003;50:84–96.

27. Piedmont RL. Does spirituality represent the sixth factor of personality? Spiritual transcendence and the five-factor model. *J Pers.* 1999;67:985–1013.

28. French AC, Piedmont RL. An evaluation of the reliability and validity of the revised Spiritual Transcendence Scale: short form. Poster presented at: Annual Mid-Winter Conference on Religiousness and Spirituality; March 19–20, 2004; Columbia, MD.

29. Ware JE, Johnston SA, Davies-Avery A, Brook RH. *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: Vol. III. Mental Health*. Santa Monica, CA: RAND Corporation; 1979.

30. Veit CT, Ware JE. The structure of psychological distress and well-being in general populations. *J Consult Clin Psychol.* 1983;51:730–742.

31. Ware JE, Manning WG, Duan N, Wells KB, Newhouse JP. Health status and the use of outpatient mental health services. *Am Psychol.* 1984;39:1090–1100.

32. Seligman ME, Schulman P, Tryon AM. Group prevention of depression and anxiety symptoms. *Behav Res Ther.* 2007;45:1111–1126.

33. Peltzer K. Religiosity, personal distress and minor psychiatric morbidity among black students in South Africa. *Soc Behav Pers.* 2005;33:723–733.

34. Phillips RE. Religious meaning—making coping for young adults with serious mental illness: a longitudinal study [dissertation]. Bowling Green, OH: Bowling Green State University; 2006.

35. Piedmont RL, Hassinger CJ, Rhorer J, Sherman MF, Sherman NC, Williams JEG. The relations among spirituality and religiosity and axis II functioning in two college samples. *Res Soc Sci Stud Religion*. 2007;18:53–73.

36. Sperry L, Hoffman L, Cox RH, Ervin-Cox B. Spirituality in achieving physical and psychological health and well-being: theory, research and low cost interventions. In: L'Abate L, ed. *Low-Cost Approaches to Promote Physical and Mental Health: Theory, Research, and Practice.* New York, NY: Springer; 2007:435–452.

37. Langer LM, Warheit GJ, McDonald LP. Correlates and predictors of risky sexual practices among a multi-racial/ethnic sample of university students. *Soc Behav Pers.* 2001;29:133–144.

38. Cortoni F, Marshall WL. Sex as a coping strategy and its relationship to juvenile sexual history and intimacy in sexual offenders. *Sex Abuse J Res Treatment.* 2001;13:27–43.

39. American College Health Association. American College Health Association—National College Health Assessment. Spring 2007 reference group data report (abridged). *J Am Coll Health.* 2008;56:465–480.