

Depression, Religiosity, and Risky Behavior

Among

College Students

by

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ABSTRACT

Depressive disorders are common among the general populations but are present at an even higher rate among college students. Some research suggests that new stressors during the transition to college may place young adults at increased risk of depressive disorders. In addition, depression in college students has been linked to a variety of risky behaviors such as alcohol use and risky sexual activity. Fortunately, research suggests that religiosity may act as a buffer and lead to lower levels of depressive symptoms and risky behavior. Current research has not adequately examined the relationship between religiosity, depression, and risky behavior among college students. In this study, depressive symptoms were measured using the 20-item Center for Epidemiological Studies Depression scale, while risky behaviors were measured using the section on risky sexual behavior from the Youth Risk Behavior Surveillance survey and the section on alcohol consumption from the Behavioral Risk Factor Surveillance System survey, both developed by the Centers for Disease Control and Prevention. Four questions frequently used in literature to measure critical behaviors and attitudes were used to assess participants' religiosity. It was predicted that engagement in risky behaviors would be associated with higher levels of depressive symptoms while increased religiosity would be associated with lower levels. Additionally, increased religiosity would be associated with lower levels of engagement in risky behavior. Multiple regression analyses revealed that risky behavior were not significantly associated with higher depressive symptoms, while higher church attendance was associated with lower depressive symptoms. Although not considered a risky behavior, ever being forced to have sex was associated with higher depressive symptoms. Linear regression analyses revealed that increased

religiosity was associated with increased engagement in risky behavior. These findings suggest that while depressive symptoms and risky behaviors are prevalent among college students, religiosity may act as a buffer and lead to lower levels of depression and risky behavior. Limitations, implications, and future research are discussed.

DEDICATION

I dedicate this work to my wife, Rebecca, without your love and support this would not have been possible. Thank you for all your patience and always pushing me to succeed.

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CHAPTER 1

BACKGROUND

Introduction

Depression is a common problem among college students. There are reports suggesting an association between depression and a variety of risky behaviors such as alcohol consumption and risky sexual activity. Given the prevalence of depression among college students and the lack of studies focusing on these variables among college students, this study examines the prevalence and relationship between depression and risky behaviors. On the other hand, some research suggests that religiosity may act as a buffer and lead to lower levels of depression and risky behaviors. Thus, this study also looks at levels of religiosity and its relationship to depression and risky behavior.

Depression

The term “depression” is often used interchangeably to refer to a mood, a symptom, or a mood disorder. The National Institute of Mental Health (NIMH) describes depression as a common and serious illness characterized by feelings of sadness or “feeling blue” which persist and interfere with daily life to the point of causing pain to the individual and loved ones (“Depression”, 2011). Further, the NIMH adds that feelings of emptiness, pessimism, irritability/restlessness, aches or pains, headaches, cramps, or digestive problems that do not ease even with treatment, may also be experienced (“Depression”, 2011). A depressive mood is characterized by feelings of sadness or hopelessness accompanied by symptoms such as decreased pleasure, disrupted eating or sleeping habits, or guilt (“Depression”, 2011). In addition, depression can be further differentiated into major depression disorder or dysthymic disorder. The Diagnostics and

Statistical Manual of Mental Disorders (DSM), published by the American Psychiatric Association (APA, 2013), defines major depressive disorder (MDD) as having had one or more major depressive episodes. Each major depressive episode consists of having depressed mood or loss of interest/pleasure in nearly all activities for most of the day for at least two weeks (American Psychiatric Association, 2013). Dysthymic disorder is defined as “having depressed mood, most of the day, more days than not for at least two years” (American Psychiatric Association, 2013). In addition to the mood changes included in the definition of major depressive disorder and dysthymic disorder, the APA adds that a variety of symptoms such as feelings of worthlessness, insomnia or hypersomnia, appetite changes, difficulty thinking, fatigue, and recurrent thoughts of death or suicide might also be experienced (American Psychiatric Association, 2013). Despite variation in the definitions, both the NIMH and APA converge on the fact that depression, whether MDD or dysthymic disorder, is a serious disorder that should be treated.

Depression Among College Students

Depressive disorders are common in the United States with 9% of the adult population meeting criteria for current depression and 3.4% meeting criteria for current MDD (Gonzalez et al., 2010). Pratt and Brody (2008) report that during any given 2-week period in 2005-2006, 5.4% of Americans aged 12 and older experienced “current depression.” Depression is an episodic condition, where individuals may experience a depressive episode, get better, and may or may not experience another episode again thereafter (Pratt & Brody, 2008). Keeping this in mind, looking at lifetime prevalence rates might provide additional information as to how common depression is. Using DSM-

IV criteria, the National Comorbidity Survey Replication study places lifetime prevalence rates of MDD and dysthymic disorder for individuals 18 years and older at 16.6% and 2.5%, respectively (Kessler et al., 2005). Additionally, the same study reported that females and young adults (18-29 years old) had an increased lifetime risk for mood disorders (Kessler et al., 2005). Compared to individuals aged 60 years and older, individuals aged 18-29 were seven and four times more likely to suffer MDD or dysthymia, respectively, (Kessler et al., 2005). There is evidence suggesting that during the transition to college, young adults might be at increased risk for depression due in part to a variety of new stressors such as new living arrangements, employment, interpersonal relationships, and academic pressures (Swanholm, Vosvick, & Chng, 2009). It has been reported that college students have higher rates of current depression (10.9%) than the general population (9%) but a lower lifetime prevalence rate for any depressive disorder (17.1%) compared to the general population (19.1%) (Gonzalez et al., 2010; Kessler et al., 2005). The National College Health Assessment (NCHA) survey conducted by the American College Health Association (ACHA) found that 14.9% of college students reported having a diagnosis of depression in their lifetime (American College Health Association, 2009). Out of those individuals with a diagnosis, only 24.5% were currently in therapy and only 35.6% were currently on anti-depressant medications (American College Health Association, 2009). Garlow et al (2008) found higher rates of depression in comparison to Gonzalez and colleagues (2010) in a study where a DSM-IV criterion based screening instrument was administered to 729 college students. Only 16.5% were classified as having “no depression”, while 60.2% were “mild to moderately depressed”, and 23.2% experienced “moderately severe” to “severe depression” (Garlow

et al., 2008). It is important to note that the study by Garlow et al. (2008) used a nine-item depression module taken from the Patient Health Questionnaire (PHQ-9), which asks about depressive symptoms in the preceding 14 days, as opposed to the CESD, which asks about symptoms in the past week.

Risky Behaviors

Depressive symptoms have been linked to a variety of risky behaviors such as smoking, alcohol use, and risky sexual activity (Brook et al, 1998; Brooks et al, 2002; Hallfors et al, 2004). The social and sexual pressures, along with readily available alcohol present in college life provide young adults with more opportunities to engage in risky behaviors such as risky sex and drinking (“College Health and Safety”, 2014; Polewchack, 2002; Swanholm et al., 2009).

Risky Sexual Behavior

Risky sexual behavior has been described as sexual behavior that may result in unintended health outcomes (“Sexual Risk Behavior”, 2014). Specifically, risky sexual behavior can include having sex while intoxicated, having sex while on drugs, having multiple sex partners, having sex for money or drugs, and not using condoms (“Sexual Risk Behavior”, 2014; Wallers et al., 2006). The 2012 NCHA survey reports that 42.9% of college students did not use or did not know if they used a method of contraception the last time they had vaginal intercourse (American College Health Association, 2012). Additionally, the survey reports that 15.8% of the college students surveyed had 3 or more sexual partners within the past 12 months (American College Health Association, 2012). A high number of lifetime sexual partners, defined as four or more by the CDC in the Youth Behavior Risk Survey (YBRS), as well as unprotected sex, places young adults

at risk for HIV and other STD infections, as well as unwanted pregnancies (Centers for Disease Control and Prevention, 2011; Centers for Disease Control and Prevention, 2012; Weinstock, Berman & Cates, 2004; Youth Risk Behavior Surveillance System, 2014). In 2009, individuals aged 20-24 had the highest rate of new diagnoses of HIV infection with 36.9 per 100,000 compared to other age groups (Centers for Disease Control and Prevention, 2011). Further, almost 50% of the newly diagnosed Sexually Transmitted Diseases (STD) is among individuals aged 15-24 years (Centers for Disease Control and Prevention, 2012; Weinstock, Berman & Cates, 2004). Of less seriousness than HIV and other STD infections but still of concern, 1.9% of the 90,666 students surveyed in the 2012 ACHA survey, had an unintentional pregnancy or got someone pregnant unintentionally. Research examining patterns of risky sexual behavior among college students has found associations with increased levels of depressive symptoms (Hallfors et al., 2004; Jackson, 2004; Swanholm et al., 2009). Waller and collaborators (2006) found that students who engage in risky sexual practices were more likely to report depressive symptoms compared to students who do not engage in these types of risky sexual practices. Of the individuals who reported having multiple lifetime sexual partners (i.e., 14 or more), females were five times more likely and males were more than two times more likely to have depressive symptoms than someone who did not have multiple sex partners (Waller et al., 2006). In addition, Green et al. (2005) found in a sample of college-aged women that MDD was significantly associated with ever having been pregnant and the number of sexual partners but not associated to birth control use. Similar associations between depression and risky sexual behavior have been reported in high school students in Nova Scotia (Wilson, Asbridge, Kisely, & Langille, 2010) as well

as in adults in Uganda (Lundberg et al., 2011), and the U.S. (Pratt, Mcquillan, Xu, & Robitz, 2010). Although, recent research suggests that depression may come first and the self-injurious risky behavior follows (Nock, 2010). The direction of the relationship is still under debate. That is, risky sexual behavior may increase rates of depressive symptoms but conversely patients suffering from depressive symptoms may engage in risky sexual behavior to provide temporary relief from their emotional pain. In brief, risky sexual behavior has been identified as a predictor of depression in various populations but other risk taking behaviors have also been implicated as predictors of depression such as alcohol consumption (Boschloo, 2011; Cranford, Nolen-Hoeksema, & Zucker, 2011; Roberts, Glod, Kim, & Houchell, 2010; Waller et al., 2006).

Alcohol Consumption

Alcohol consumption is defined as consuming a beverage that contains 0.6 ounces of pure alcohol such as one 12-ounce beer, eight ounces of malt liquor, five ounces of wine, or 1.5 ounces of a distilled spirit/liquor (“Alcohol Use and Your Health”, 2014). Not surprisingly, alcohol consumption among young adults, particularly college-bound, is highly prevalent with current use rates (having at least one alcoholic beverage in the past 30 days) as high as 38.7% (Centers for Disease Control and Prevention, 2012). The 2012 National Survey on Drug Use and Health found that 60.3% of college students consumed alcohol (any amount) in past month compared to 51.9% non-college students of the same age (Substance Abuse and Mental Health Services Administration, 2013). Alcohol use among young adults has been linked to unintentional injuries, academic/occupational problems, and illegal behavior (“Alcohol Abuse and Underage Drinking”, 2014). Long-term effects of alcohol use include liver disease, cardiovascular disease, neurological

damage and psychiatric disorders, including depression and anxiety (“Alcohol Abuse and Underage Drinking”, 2014; Flensburg-Madsen et al., 2011; Naimi et al., 2003). When compared to alcohol abstainers, college students who reported drinking alcohol were almost three times more likely to report depressive symptoms and up to six times more likely if they reported binge drinking (Waller et al., 2006). Other studies have found similar associations between alcohol consumption and depression in adults in the Netherlands (Boschloo et al., 2011), U.S. adults over age 18 (Cranford, Nolen-Hoeksema, & Zucker, 2011), and other U.S. college students (Roberts, Glod, Kim, & Houchell, 2010).

To summarize, consumption of alcohol and risky sexual behaviors have been shown to be predictors of depression in college students along with other serious consequences (e.g., STD’s, unwanted pregnancies, unintentional injuries, social and legal problems) and for that reason it is crucial to look at possible solutions that may reduce these behaviors (“Alcohol Abuse and Underage Drinking”, 2014; Centers for Disease Control and Prevention, 2011; Centers for Disease Control and Prevention, 2012; Flensburg-Madsen et al., 2011; Weinstock, Berman & Cates, 2004).

Religiosity

Considering the prevalence of depression in college students and its association with risky sexual behavior and alcohol consumption, it is important to look at potential buffers to decrease depression among this population. There is some evidence to suggest that religiosity/spirituality may actually provide a buffer and lead to lower levels of depression and alcohol consumption (Berry & York, 2011; Desrosiers & Miller, 2007; Koenig, 2009; Marsiglia, Ayers & Hoffman, 2012; Rostosky, Danner, & Riggle, 2010;

Wells, 2010). Berry and York (2011) examined the effect of religiosity/spirituality on depression and found an inverse relationship: higher levels of religiosity/spirituality were significantly associated with lower levels of depression. Similarly, higher religiosity/spirituality was correlated with lower depression levels in girls, however this relationship was not observed in boys (Kirchner & Patino, 2010). Gender differences may be partially explained by the fact that girls have higher levels of depression and spirituality than boys to begin with (Desrosiers & Miller, 2007). Religiosity also seems to have a negative correlation with risky sexual behavior. Higher religiosity scores resulted in delaying the age of first sexual intercourse in boys and girls, however this was only observable in middle to late adolescents and only when the mother also had a high religiosity score (Bearman & Bruckner, 2001; Whitbeck, Yoder, Hoyt, & Conger, 1999). Although, the responsible mechanism is unknown; some research suggests that higher religiosity/spirituality scores correspond to lower stress levels, which lead to lower levels of depression (Kim, 2008; Kirchner & Patino, 2010). A similar mechanism might be mediating the relationship between religiosity and alcohol intake. Higher religiosity also resulted in up to 15% decreased odds of heavy drinking and a 31% decreased chance of consuming any alcohol (Marsiglia, Ayers & Hoffman, 2012; Rostosky, Danner, & Riggle, 2010). Not surprisingly, Wells (2010) found that college students who went to a religious college had higher religiosity scores than students at a state university and were four times less likely to be moderate to heavy drinkers.

Study Aim

Given the high prevalence of risky sexual behavior and alcohol consumption and its association with depression in college students, it is important to evaluate the potential

buffering effects of religiosity. To date, few studies looking at the effects of religiosity on depression, risky sexual behavior or alcohol consumption have focused on college students (Bearman & Bruckner, 2001; Berry & York, 2011; Maselko, Gilman, & Buka, 2009). The purpose of the current study is to evaluate the effects of religiosity/spirituality on risky sexual behavior, alcohol consumption and depressive symptoms among college students. It is hypothesized that 1) engaging in risky sexual behavior and consuming more alcohol will predict higher depression scores; 2) higher religiosity/spirituality will predict lower depression scores; and 3) higher religiosity/spiritually levels will be associated with lower levels of engagement in risky sexual behavior and alcohol consumption.

CHAPTER 2

METHOD

Sample Selection

A sample of 300 college students enrolled in psychology courses were invited to participate in this study. College students who participated in this study received credit to fulfill course requirements. After sign-up, the students were provided with access to an online questionnaire. The online questionnaire was completed anonymously and no attempt to track the IP address was made. Participants were assigned a unique identifier number in order to provide the students with course credit. At the end of the survey, a page with contact information to Arizona State University Counseling Services was provided to all participants. The Arizona State University Institutional Review Board approved this study.

Measures

Four separate measures were used in this study. The Center for Epidemiological Studies Depression Scale (CES-D) is one of the most widely used self-report scales that measures depressive symptoms in the past week by asking about various feelings and behaviors such as feeling sad or having crying spells (Radloff, 1977). Participant's responses were scored using the following scale: 0= "rarely or none of the time" (less than 1 day), 1= "some or a little of the time" (1-2 days), 2= "occasionally or a moderate amount of time" (3-4 days), or 3= "most or all of the time" (5-7 days). A total score ranging from 0-60 was obtained after reversing items 4, 8, 12, and 16. A cut-off score of 16 is considered suggestive of depressive symptoms, with higher scores indicating more severe depressive symptoms (Radloff, 1977). The CES-D has been validated in the

general population and adequate to high sensitivity, specificity, and overall classification accuracy was achieved with a cutoff score of 16 (Balwin, 2008; Prescott et al., 1998; Radloff, 1977).

Risky sexual behavior was assessed using the section on sexual behavior from the YRBS, developed by the Centers for Disease Control and Prevention (“Youth Risk Behavior Surveillance System”, 2014). This questionnaire asks about: age at the first time of sexual intercourse, number of sexual partners in lifetime and in the past three months, use of alcohol/drugs before sexual intercourse, contraceptive use, and sexual violence. The CDC has validated the Youth Risk Behavior Survey, which includes the items asking about sexual behavior (Centers for Disease Control and Prevention, 2013). Additionally, a study conducted by Brener et al. (2002), assessed the test-retest reliability of the YBRS. Additionally, Brener and colleagues (2002) demonstrated that the YBRS had “moderate reliability” or “substantial reliability” on the questions asking about sexual behavior and that no differences were apparent by gender, age, or race/ethnicity.

Alcohol consumption was assessed using the alcohol consumption section in the Behavioral Risk Factor Surveillance System Questionnaire (BRFSS), also developed by the CDC (“Behavioral Risk Factor Surveillance System”, 2013). The BRFSS contains two items that ask frequency of alcohol consumption in the past 30 days. One item asked participants on how many days of the past 30 days did they consume at least one alcoholic drink. The second item asked participants on how many days did they consume five alcoholic drinks in a row, within a couple of hours. Behavioral Risk Factor Surveillance System Questionnaire has been used in all 50 states since 1994 and has

moderate to high reliability and validity in most of its core questions (“Behavioral Risk Factor Surveillance System”, 2013; Nelson, Holtzman, Bolen, Stanwyck & Mack, 2001).

An index (labeled “Risky Behavior Index”) was created combining six risky sexual behavior items and three alcohol consumption items. The resulting index yielded a Cronbach’s alpha of 0.768. The risky sexual behavior items included asked at what age did the participant first have intercourse, how many sexual partners participants have had in their lifetime and in the past three months, whether they were on birth control, and whether they had used a condom or alcohol/drugs the last time they had sexual intercourse. The items concerning alcohol consumption that were included in the index asked on how many days in the past 30 days the participant had at least one drink, had at least five drinks in a row in a couple of hours, and whether they drove a vehicle after consuming alcohol.

Four questions measuring critical behaviors and attitudes towards religion frequently used in literature were used to assess religiosity/spirituality: including a question ascertaining the frequency of attendance to religious services (Huijts & Kraaykamp, 2011; Whitbeck et al., 1999; Rohrbaugh & Jessor, 1975; Marsiglia et al., 2012; Bearman & Bruckner, 2001; Wells, 2010; Maselko et al., 2009; Kim, 2008; Beck, Cole & Hammond, 1991), the frequency of prayer (Bearman & Bruckner, 2001; Rohrbaugh & Jessor, 1975; Wells, 2010; Kim, 2008), and two items asking how important were their religious and spiritual beliefs (Whitbeck et al., 1999; Marsiglia et al., 2012; Bearman & Bruckner, 2001; Vasegh & Mohammadi, 2007; Kim, 2008), and if they belong to a particular religious denomination (Huijts & Kraaykamp, 2011; Beck et al., 1991).

Similarly, an index (labeled “Religiosity Index”) was created using three items asking about religiosity. The religiosity items included asked about frequency of church attendance, importance of religion to the participant, and frequency of prayer. The Religiosity Index yielded a Cronbach’s alpha of 0.886.

A higher score in the risky behavior index indicates more involvement in risky behavior, while a higher score in the religiosity index indicates less religiosity. In addition to the measures administered, a demographics section of the survey inquired about participant’s gender, age, ethnicity, employment and marital status.

Statistical Analyses

Descriptive statistics were computed for all variables. The CES-D scores were calculated and dichotomized into a variable in which a score under 16 indicates “no depression” (coded 0) and a score of over 16 indicates “mild to severe depression” (coded 1). Gender was recoded as male=0 and female=1. The items asking about sexual behavior, alcohol consumption, and religiosity/spirituality were recoded 0, 1, 2..., increasing with each response option, while the risky behavior and religiosity indices were treated as interval variables.

Demographic variables were entered individually as categorical variables into a univariate logistic regression with depression as the outcome variable. The risky behavior and religiosity items, as well as the risky behavior and religiosity indices were entered individually as interval variables into a univariate logistic regression with depression as the outcome variable. Predictors that were significantly related to depression with a $p < .10$ were entered into a stepwise multiple logistic regression. Odds ratios (OR) and the 95% confidence interval (CI) were calculated to estimate the probability of depressive

symptoms, given the experience of the independent variables of interest (i.e., risky behaviors, religiosity) adjusting for possible confounders (demographic characteristics). Predictors with a $p < .05$ were considered significant predictors of depression. To test the relationship between risky behavior and religiosity, the religiosity index was entered as a predictor of the risky behavior index in a linear regression. A correlation between the risky behavior index and the religiosity index was also calculated using Pearson Product Moment Correlation Coefficient. The statistical analysis was performed with SPSS Statistical Package 22. (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp)

CHAPTER 3

RESULTS

Of the 300 participants who completed the study, seven cases were deleted due to missing data and another two cases were deleted due to inconsistent answers. Of the remaining cases, the majority of participants 223 (76.6%) were females. The mean age was 22.8 years with a SD of 5.744 years, ranging from 18 to 52 years old. One hundred eighty-five (63.8%) reported being Caucasian and 106 (36.2%) indicated a minority group including Hispanic, Native-American, African-American, Asian American, or other. One hundred-sixty two (55.7%) participants were full-time students, 114 (39.2%) were employed, and 15 (5.2%) were unemployed. The majority of participants 190 (68.8%) were not in a relationship (i.e., single, divorced, or separated), while 86 (31.2%) were in a relationship (i.e., married, cohabiting or living with a domestic partner).

CESD scores ranged from 0 to 52. When the scores were dichotomized using the cut-off score of 16, 175 (60.1%) participants were below a score of 16 into the category of not displaying depressive symptoms. The remaining 116 (39.9%) participants had a CESD score of 16 or greater indicative of depressive symptomatology.

Of the 291 students in the sample, 241 (82.8%) participants had ever had sexual intercourse, while 50 (17.2%) stated they had never had sexual intercourse in their lifetime. When asked at what age sexual intercourse first occurred, 121 (41.6%) reported having sexual intercourse after the age of 17, 111 (38.1%) between the ages of 14 and 16, and 10 (3.4%) at the age of 13 or younger. One third of the sample (95, 32.1%) reported having had sex with one or two people in their lifetime, 86 (29.6%) reported having sex with six or more people, and 60 (20.6%) with three to five people. When asked how

many people had they had sexual intercourse with over the past three months, the majority 156 (53.6%) reported one person, 31 (10.7%) with 2-4 people, 5 (1.7%) with 5 or more people. The remaining participants (99, 34%) reported never having sex in their lifetime or not having had sex in the past three months.

When asked more detailed questions about the last time participants had engaged in sexual intercourse, 58 (19.9%) reported using drugs or alcohol before having sexual intercourse. The last time that participants engaged in sexual intercourse, a surprising 144 (49.8%) reported not using a condom, while only 95 (32.9%) reported using one, while the rest reported never having had sex. Although a condom may not have been used, it does not necessarily mean no method of birth control was used since only 23 (7.9%) participants reported not having used any form of birth control. One hundred sixty eight (57.9%) participants used birth control pills, some type of injectable birth control or intrauterine device, 46 (15.9%) used the withdrawal method or some other method (hormonal patch, diaphragm, cervical cap, or emergency contraception) and 3 (1%) were not sure. Of the participants sampled, 44 (15.2%) reported having been forced to have sexual intercourse at some point in their lives.

When participants were asked about alcohol consumption in the past 30 days, responses ranged but close to half the students (132 participants, 45.5%) had at least one drink on 1-5 days in the past 30 days. Only 101 (34.8%) indicated that they did not consume alcohol in the past 30 days and five (1.7%) indicated they consumed at least one drink of alcohol on 20 or more days of the past 30 days. Concerning the consumption of larger amounts of alcohol or binge drinking (five or more drinks within a couple of hours), the majority of participants (192, 66.2%) indicated they had not done this in the

past 30 days. Sixty (20.7%) stated they had five or more drinks, one or two days in the past 30 days, 38 (13.1%) stated they had done this 3-10 or more days in the past 30 days. Fortunately, 245 (84.5%) participants from the sample reported not driving after drinking alcohol in the past 30 days, while 45 (15.5%) participants reported doing it at least once.

Responses from participants on the religiosity section of the survey produced some unexpected results. While only 169 (58.3%) participants answered YES to the question, *Do you consider yourself to belong a particular religion or denomination?*, 192 (66.2%) indicated belonging to some type of Christian denomination including catholic, protestant, and eastern orthodox, and 33.8% indicated other non-Christian religion. However, attendance to religious services was significantly lower with only 87 (31%) of participants attending religious services at least once a month. The 194 (69%) remaining participants attended only on (13.9%) special holidays, and (55.1%) less often or never. The importance placed by participants on their religious or spiritual beliefs was roughly split with 161 (55.5%) reporting that their beliefs are at least moderately important and 129 (44.5%) reporting that their beliefs were slightly important or not at all. One hundred twelve participants (38.6%) responded that they prayed or practiced some form of religious meditation daily or weekly, 89 (30.7%) participants stated that only during times of stress or formal ceremonies, and the remaining participants (89, 30.7%) reported never engaging in prayer or religious meditation.

Hypothesis 1) engaging in risky sexual behavior and consuming more alcohol will predict higher depression scores.

Individuals who did not use a condom the last time they had sex were 37.7% more likely to exhibit depressive symptoms than their counterparts (OR= 1.377, 95% CI: .998-

1.900, $p = .051$). Unsurprisingly, individuals who had ever been forced to have sex in their lifetime were three and a half times more likely to report depressive symptoms (OR= 3.533, 95% CI: 1.797-6.946, $p < .001$). Meanwhile, individuals who drank at least one drink of alcohol on 1-5 days in the past 30 days were 24% more likely to have depressive symptoms than people who did not consume alcohol (OR= 1.239, 95% CI: .972-1.580, $p = .084$). Additionally, if individuals consumed more than five alcoholic beverages on a single occasion on one or two day, they were 41.9% more likely to have depressive symptoms (OR= 1.419, 95% CI: 1.040-1.936, $p = .027$). When the risky behavior index was entered as a predictor of depressive symptoms, it was approaching significance (OR= 1.049, 95% CI: .991-1.111, $p = .101$). In the multiple logistic regression, controlling for age and gender, people who had ever having been forced to have sex were 3.8 times (OR= 3.839, 95% CI: 1.875-7.859, $p < .001$) more likely to display depressive symptoms than people who had never been forced to have sex. Although, alcohol consumption and some risky sexual behaviors appear to be significant predictors of higher depression scores in unadjusted analyses, when examined along with other variables in the adjusted multiple regression analysis, they were no longer predictors and proved the first hypothesis false (i.e, the null hypothesis was accepted).

Hypothesis 2) higher religiosity/spirituality will predict lower depression scores.

Increased church attendance was significantly related to depressive symptoms with a 22% decreased chance of depressive symptoms (OR= 1.222, 95% CI: 1.011-1.476, $p = .038$). Likewise, frequency of prayer was significantly related depressive symptoms, as frequency decreased, chances of depressive symptoms increased by 15.9% with each category (OR= 1.159, 95% CI: .996-1.348, $p = .056$). The index created to measure

religiosity was significantly related to depressive symptoms as well (OR= 1.060, 95% CI: .998-1.127, $p = .059$). In the multiple logistic regression, only church attendance was a significant predictor of depressive symptoms (OR= 1.215, 95% CI: 1.002-1.474, $p = .048$). That is, the likelihood of participants reporting depressive symptoms increased by 22%, with each declining category of church attendance. Although, the index constructed to measure religiosity was not a significant predictor of depression scores, individual behaviors such as prayer frequency (univariate analyses) and church attendance (univariate and multivariate analyses) were significant predictors of lower depression.

Hypothesis 3) higher religiosity/spiritually levels will be associated with lower levels of engagement in risky sexual behavior and alcohol consumption.

A weak correlation was found between the risky behavior index and the religiosity index with an $r = .216$, $p < .001$. As the hypothesis stated, the linear regression results indicate that higher religiosity index scores were significant predictors of lower risky behavior scores ($\beta = .216$, $p < .001$). The overall model fit was $R^2 = .047$. Although there is a weak relationship between risky behavior and religiosity, the hypothesis is confirmed (i.e., null hypothesis rejected) since this relationship is present.

CHAPTER 4

DISCUSSION

Conclusions

The proportion of students reporting depressive symptoms (39.9%) was higher than the percentage levels reported by Yang et al. (2007) (21%) when using the conventional cut-off of 16. When comparing results using a different cut-off, levels were still higher (22.6%) than those reported by Beck et al. (2009) (7.6%) when a cut-off of 23 was used. However, when compared to a cut-off 25, levels are about equal (16.5%) to those reported by Swanholm et al. (2009) (16.8%). Thus, levels are comparable to previous studies but only when a higher cut-off is used. This suggests that false positives may be present using a lower cut-off.

Most sexually active students in the sample (92.1%) reported using a birth control method the last time they engaged in sex compared to 57.1% of the national sample reported by the 2012 NCHA survey (American College Health Association, 2012). However, only 95 (32.9%) reported using a condom. Similarly to reports of the NCHA survey, 12.4% of students surveyed had 3 or more sexual partners within the past 12 months compared to 15.8% of the students in the national sample (American College Health Association, 2012). Most students (87.6%) in the sample reduced their risk of STD infection by having a low number of sexual partners in the past 90 days (defined as four or more by the CDC in the YBRS). While having a small number of sexual partners put students at reduced risk of STD infection, over two-thirds were at increased risk of STD infection since they did not use a condom. Although most of the sample used some

form of birth control, the majority of birth control methods used aim at preventing pregnancy and do not provide protection against STD's as condoms do.

While ever having been forced to have sex is not considered risky behavior, 15.2% of the sample experienced it in their lifetime and were significantly more likely (3.8 times) to report depressive symptoms than their counterparts. Regarding alcohol consumption, more students reported consuming alcohol (47.2%) than those reported by the CDC (38.7%) (Centers for Disease Control and Prevention, 2012). However, despite high levels of risky behavior, students who reported engagement in risky behavior were no more likely to report depressive symptoms, contrary to previous research (Jackson, 2004; Hallfors et al, 2004; Swanholm et al., 2009; Waller et al, 2006; Berry & York, 2011; Desrosiers & Miller, 2007; Koenig, 2009).

About 58.3% reported being religious, consist with values reported in Kosmin & Keysar (2013) (64.2%) and somewhat lower than values reported in the 2007 U.S. Religious Landscape Survey (75%) ("Religion Among the Millennials", 2010). Similar to values reported by others, most students (66.2%) identified themselves as Christian including catholic, protestant, and eastern orthodox compared to 54% and 68% (Thomas & Freeman, 2011; "Religion Among the Millennials", 2010 respectively. The discrepancy between the number of individuals who consider themselves religious versus those who identify themselves as belonging to a particular religious denomination suggests that belonging to a religion may not be reflective of how individuals identify themselves. For example, an individual might state that they belong to a certain religion or denomination but might only do so because they were raised in that religion or because of familial pressures not because they truly identify with that religion or its beliefs.

Similar to what others have found, regular church attendance is noticeably lower than religiousness or self-identification with a religion (66.2%). Although two-third reported attending church, only half of them (31%) reported attending religious services at least once a month, consistent with values reported by the 2007 U.S. Religious Landscape Survey (33%) (“Religion Among the Millennials”, 2010). The religious practices of young adults varied widely, two thirds of the students (61.4%) reported praying or practiced some form of religious meditation, compared to 48% reported by the 2007 U.S. Religious Landscape Survey (48%) (“Religion Among the Millennials”, 2010) and 98% in a more recent study (Thomas & Freeman, 2011) (98%) in a sample from a historically African-American College. However, it must be noted that this may be because African-American individuals usually report higher levels of religiosity than other ethnicities (Thomas & Freeman, 2011). Additionally, the sample consisted of only females who also usually report being more religious than males (Desrosiers & Miller, 2007).

Additionally, 76.6% considered their religious or spiritual beliefs important (at least slightly important), roughly half (55.5%) reporting that their beliefs are at least moderately important. Similar to what has been reported by others (Berry & York, 2011; Kirchner & Patino, 2010), students who attended church at least once a month were be less likely to report depressive symptoms. Due to the correlational nature of this study, it can only be speculated as to why this is the case. Since social support is correlated with lower levels of depression, attending church might be a place where individuals might receive this type of support (Peirce, Frone, Russel, Cooper & Mudar, 2000). It may be that individuals receive social support when attending church and either have a reduction in depressive symptoms or are less likely to develop depressive symptoms in the first

place. Conversely, it may be that individuals that are more likely to attend church might not have been at risk of developing depressive symptoms in the first place. Consistent with previous research and the hypothesis, an inverse correlation was observed between religiosity and risky behaviors (Galambos & Tilton-Weaver, 1998; Haglund & Fehring, 2010). That is, students who scored low on the religiosity index (i.e., went to church more, prayed more, considered religion more important) were less likely to score high on the risky behavior index (encompasses engagement in risky sexual behavior and alcohol consumption). A possible explanation could be that individuals who are more religious may be less likely to engage in risky behaviors such as risky sex or alcohol consumption in the first place because of religious beliefs.

In summary, the results of this study support previous evidence that church attendance has a protective effect against depression while religiosity is inversely associated to risky behavior. However, contrary to the literature, the results do not support an association between depression and risky behavior.

Limitations

Although religious behaviors included in the religiosity index were associated with decreased involvement in risky behavior, it is important to note that other variables not considered in this study may be involved in this relationship. “Religious Market Density” (i.e., how many people around them are affiliated with a particular religion) has been reported to be associated with lower engagement in risky behaviors, although it is unknown if this variable’s mechanism is direct or whether it is associated indirectly by increasing religious involvement (i.e., increased church attendance, increased prayer,

considering religion more important) (Mellor & Freeborn, 2011). Family structure (traditional vs. non-traditional) appears to work in a similar manner (Wigfall et al., 2012).

The sample used for this study consisted of relatively small amount of college students at a large university; therefore it is important to remember this when applying the results of this study to other populations. Although the majority of participants were of the typical college age (18-29), there were also many participants out of this age range, which affects how the results are generalized to other populations. The administration of the questionnaire via an anonymous website also adds a level of unreliability since respondents may be selecting any answer just to complete the survey and receive class credit. The actual design of the questionnaire may have contained errors that allowed participants to proceed to the next question without answering or proceed to a question that did not apply to them.

Further limitations of this study are in the form of the scales that were used to measure religiosity. A scale was constructed using questions that have been used to measure religiosity/spirituality in other studies, as opposed to using a validated scale. Further research is needed in order to determine which behaviors/beliefs are accurate measures of religiosity/spirituality. That is, an individual's religious behaviors may not necessarily be reflective of that individual's religiosity or spirituality. Involvement in religious behaviors may be pursued for other reasons (i.e., social support, place to socialize with friends) or may be done due to pressures of friends or family.

Future Research

More research is needed on all of the subjects examined in this study. Particularly, research should focus on the possible relationship between forced sex (i.e., sexual assault,

rape) and depressive symptoms in college students. With a large number of college students reporting ever having been forced to have sex, 44 out of a sample of 289, it is important to examine this statistic in more detail. For example, how many times it occurred, where did it occur, at what age, and by whom. Young adults in college are at particular risk because of behaviors they commonly engage in (i.e., risky sexual behavior and alcohol consumption). A study using the National Violence Against Women Survey found that dating violence (physical aggression, forced sex, stalking) was associated with current depressive symptoms in women (Slashinski, Coker & Davis, 2003). In a study conducted in 2011, only 11.5% of 2000 women samples reported their rape/forced sex incident to the authorities (Wolitzky-Taylor et al, 2011). The sensitivity and personal nature of this matter will make it difficult to obtain data for a study on this. Although, the anonymity of online research studies may help obtain a clearer picture when compared to official statistics provided by college campuses mandated by the Clery Act (“Summary of Jeanne Clery Act”, 2012). The prevalence of forced sex and its possible association with higher depressive symptoms in college students make it an important target for future research. Obtaining a clearer relationship and prevalence rate of the occurrence of forced sex and depressive symptoms in college students may help mental health professionals and college campuses to better provide the necessary resources to this at-risk population.

Future research should examine the relationship between attendance to religious services and depressive symptoms, particularly what type of benefit religious services provide to an individual that may help lower the risk for development of depressive symptoms. Additionally, research should examine other variables that influence religiosity in college students. “Religious Market Density” and family structure appear to

influence religiosity leading to less engagement in risky behavior (Haglund & Fehring, 2010; Mellor & Freeborn, 2011; Wigfall et al., 2012). In addition to family structure, informal parental sex education that included abstinence was also associated with less engagement in risky behavior (Haglund & Fehring, 2010). Examining these variables might help clarify how religiosity acts as a protective factor. Lastly, future research on the subject should aim to find out which religious behaviors are accurate measures of an individual's religiosity.

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TABLES

Table 1. Descriptive statistics for Demographic, risky behavior, religiosity, and Depression variables

Demographic Variables	
Age Range in years	18-52
Mean Age	22.76
Gender (Female)	76.6%
Race (Caucasian)	63.8%
In Relationship	68.8%
Full-time Students	55.7%
Risky Behavior Variables	
Ever had sexual intercourse	82.8%
First time sexual intercourse after age 17	41.6%
≥6 lifetime sexual partners	29.6%
≥ one sexual partners in past 3 months	66%
Used drugs or alcohol before sex	19.9%
Did not use condom last sexual intercourse	49.8%
Used no form of birth control last sexual intercourse	7.9%
Ever forced to have sex	15.2%
Had at least 1 alcoholic drink in past 30 days	45.5%
Had at least 5 alcoholic drinks in a couple of hours in the past 30 days	33.8%
Drove a car after drinking alcohol	15.5%
Religiosity Variables	
Considered themselves to belong to a particular religion or denomination	58.3%
Considered themselves to belong some type of Christian denomination	66.2%
Attended church at least once a month	31%
Considered religion at least moderately important	55.5%
Prayed daily or weekly	38.6%
Never prayed	30.7%
Depression Variables	
CESD Median and Range	14, 0-52
Depression (CESD ≥ 16 Mild-Severe)	39.9%

Table 2. Univariate Logistic Regression Analyses. Odds of having a CESD ≥ 16 predicted by demographics, risky behaviors, and religiosity.

Predictor	Outcome: Depression CESD ≥ 16	
	OR (95% CI)	p value
Gender	.931 (.536-1.618)	.800
Age	1.025 (.985-1.068)	.227
Race	1.023 (.627-1.668)	.928
Relationship Status	.790 (.471-1.327)	.373
Student/employment status	1.066 (.708-1.606)	.759
Sexual Intercourse (ever)	1.353 (.714-2.564)	.353
Age of first time	1.031 (.763-1.394)	.840
Lifetime Sexual Partners	1.161 (.932-1.445)	.182
Sexual Partners in Past 3 Months	.974 (.693-1.369)	.879
Use of drugs or alcohol during last sexual intercourse	1.082 (.603-1.942)	.792
Condom use	1.377 (.998-1.900)	.051
Type of Birth Control	1.181 (.731-1.906)	.496
Ever forced to have sex	3.533 (1.797-6.946)	< .001
At least 1 alcoholic drink in past 30 days	1.239 (.972-1.580)	.084
At least 5 alcoholic drinks in few hours in past 30 days	1.419 (1.040-1.936)	.027
Drinking and Driving in past 30 days	1.000 (.523-1.913)	1.000
Consider themselves to belong to a religion	1.036 (.644-1.668)	.884
Religious Denomination	1.040 (.951-1.137)	.387
Church Attendance	1.222 (1.011-1.476)	.038
Importance of Religion	1.124 (.961-1.314)	.145
Frequency of Prayer	1.159 (.996-1.348)	.056
Religiosity Index	1.060 (.998-1.127)	.059
Risky Behavior Index	1.049 (.991-1.111)	.101

APPENDIX A
QUESTIONNAIRE

Eligibility

Are you 18 years old or more?

- A. Yes
- B. No

Demographics

1. What is your gender?

- A. Female
- B. Male

2. What is your age? _____

3. Do you think of yourself as...?

- A. Caucasian
- B. Hispanic
- C. African American
- D. Native American
- E. Asian American
- F. Refuse to answer
- G. Other

4. Are you currently...?

- A. Employed (includes self-employment)
- B. Unemployed
- C. Retired
- D. Full-time student
- E. On disability

5. What is your current relationship status?

- A. Married
- B. Single/Not in relationship
- C. Divorced/Separated
- D. Cohabiting/Domestic partner
- E. Refuse to answer

CES-D

Below is a list of ways you might have felt or behaved in the past. Indicate how often you have felt this way during the past week using the following choices: A) Rarely or none of the time (less than 1 day), B) Some or a little of the time (1-2 days), C) Occasionally or moderate amount of time (3-4 days), D) Most or all the time (5-7 days).

1. I was bothered by things that usually don't bother me.
2. I did not feel like eating; my appetite was poor.
3. I felt that I could not shake off the blues even with help from my family or friends.
4. I felt that I was just as good as other people.
5. I felt depressed.
6. I felt that everything I did was an effort.
7. I had trouble keeping my mind on what I was doing.
8. I felt hopeful about the future.
9. I thought my life had been a failure.
10. I felt fearful.
11. My sleep was restless.

12. I was happy.
13. I talked less than usual.
14. I felt lonely.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people disliked me.
20. I could not get going.

Sexual Behavior

1. Have you ever had sexual intercourse?
 - A. Yes
 - B. No
2. How old were you when you had sexual intercourse for the first time?
 - A. I have never had sexual intercourse
 - B. 11 years old or younger
 - C. 12 years old
 - D. 13 years old
 - E. 14 years old
 - F. 15 years old
 - G. 16 years old
 - H. 17 years old or older
3. During your life, with how many people have you had sexual intercourse?

- A. I have never had sexual intercourse
 - B. 1 person
 - C. 2 people
 - D. 3 people
 - E. 4 people
 - F. 5 people
 - G. 6 or more people
4. During the past 3 months, with how many people did you have sexual intercourse?
- A. I have never had sexual intercourse
 - B. I have had sexual intercourse, but not during the past 3 months
 - C. 1 person
 - D. 2 people
 - E. 3 people
 - F. 4 people
 - G. 5 people
 - H. 6 or more people
5. Did you drink alcohol or use drugs before you had sexual intercourse the **last time**?
- A. I have never had sexual intercourse
 - B. Yes
 - C. No

6. The **last time** you had sexual intercourse, did you or your partner use a condom?
- A. I have never had sexual intercourse
 - B. Yes
 - C. No
7. The **last time** you had sexual intercourse, what **one** method did you or your partner use to **prevent pregnancy**? (Select only **one** response.)
- A. I have never had sexual intercourse
 - B. No method was used to prevent pregnancy
 - C. Birth control pills
 - D. Condoms
 - E. Depo-Provera (or any injectable birth control), Nuva-Ring (or any birth control ring), Implanon (or any implant), or any IUD
 - F. Withdrawal
 - G. Some other method
 - H. Not sure
8. Have you ever been physically forced to have sexual intercourse when you did not want to?
- A. Yes
 - B. No

Alcohol Consumption

1. During the past 30 days, on how many days did you have at least one drink of alcohol?

- A. 0 days
 - B. 1 or 2 days
 - C. 3 to 5 days
 - D. 6 to 9 days
 - E. 10 to 19 days
 - F. 20 to 29 days
 - G. All 30 days
2. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?
- A. 0 days
 - B. 1 day
 - C. 2 days
 - D. 3 to 5 days
 - E. 6 to 9 days
 - F. 10 to 19 days
 - G. 20 or more days

9. Religiosity

1. Do you consider yourself to belong a particular religion or denomination?
- A. Yes
 - B. No
2. To which religion or denomination do you consider yourself to belong to?
- a. Catholic
 - b. Protestant

- c. Eastern Orthodox
 - d. Other Christian Religion
 - e. Jewish
 - f. Muslim
 - g. Eastern Religions
 - h. Other Non-Christian religions
3. How often do you attend religious services?
- A. Every day
 - B. More than once a week
 - C. Once a week
 - D. At least once a month
 - E. Only on special holidays
 - F. Less often or never
 - G. Refuse to answer
4. How important are your religious and spiritual beliefs in your life?
- A. Very important
 - B. Important
 - C. Moderately important
 - D. Slightly important
 - E. Not at all important
5. How often do you pray or practice religious meditation?
- A. Daily
 - B. Weekly

- C. Only in times of stress or need
- D. Only during formal ceremonies
- E. Never