Understanding the mental health needs of Latina college students: Exploring issues of prevalence, measurement, and service utilization for mental health and substance use problems among a national sample

by

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Abstract

Latina college students experience significant stress and psychological distress in the college campus context. They report higher rates of depression and anxiety than Latino and non-Latina female students. Mental health problems interfere with academic success and Latina report the lowest rate of college completion among female college students. It is essential that the mental health needs of this at-risk population be addressed. Using a national dataset of college student mental health, three studies were conducted to gain a better understanding of the mental health needs of Latina college students. Study one found that Latinas (N=1,274) were more likely than White females (N=9,797) to experience depression and less likely to use substances. Social support and religiosity were protective factors and institutional dissatisfaction and discrimination were risk factors for mental health and substance use problems. However, there were differences between Latinas and Whites in the way that these factors influenced these problems. The second study explored the structure and function of an existing depression assessment instrument (Patient Health Questionnaire-9) among Latina (N=1,455) and White female college students (N=15,299). Through a series of factor analyses it was confirmed that the PHQ-9 was best utilized as a two-factor measure of depression among Latina and White female college students and there was no evidence of a construct bias. The third study examined the rates and associations of mental health service utilization among Latina college students (N=1,876) and found an unmet need for services among

this population. Less than a third of Latinas who reported experiencing depression, anxiety, eating disorder symptoms, suicidal ideation, or substance use problems had used mental health services. Latinas who perceived they had a problem, who had positive attitudes and beliefs about services, and who were more religious were more likely to have received services. Findings from these three studies suggest that Latina college students are an at-risk group for mental health and substance use problems. Increasing mental health literacy among Latina students as well as service providers, faculty, and administration may help to increase detection and receipt of appropriate treatment for mental health and substance use problems.

Chapter 1

Introduction

Isabella had always dreamed of going to college. Although neither of her parents nor her older brother had a college education, she had heard that Latinas who went to college had many more opportunities in life. After graduating high school, despite her parents' discouragement, she decided to attend a large public university 3,000 miles from her hometown. She was excited, but scared. She had didn't know what to expect given that she was the first in her family to pursue higher education. She also had never spent much time away from her family much less lived across the country from them. Her first semester was hard. She was trying to adjust to the new environment, she had to get a part-time job, and she felt guilty that she wasn't home helping her mother take care of her little brothers and sisters. She had always been a straight A student, but she found it was difficult to manage both her job and her schoolwork and she was getting Bs and Cs. She didn't have many friends on campus, partly because when she wasn't studying she was working but also because she was one of the only Latinas in her dorm and she felt like she couldn't relate to most other students.

Second semester, things were much the same except Isabella's feelings of loneliness, guilt, and sadness were increasing. She couldn't sleep anymore. She had gained weight. She didn't have time to work out, but she also was eating more and more junk food especially when she was upset. Her grades continued to drop. She started to

feel that maybe college was not for her and she might better off if she quit and got a full-time job back home. She could be with her family and help them with childrearing and finances. She was feeling discouraged. She didn't know what to do. She didn't know who to talk to. She felt that her family wouldn't understand because none of them had gone to college. She had no close friends to talk and didn't feel comfortable sharing her difficulties with any of her teachers. She was struggling in silence and no one knew.

Unfortunately Isabella's experience is not all that uncommon among Latina college students. Many Latina youth are pursuing their college education with the dream of bettering their lives and the lives of their family members. In fact, over the past 30 years there has been almost a 2 fold increase in Latinas enrolling in college (Fry, 2009). However, despite increased enrollment among Latina youth, degree conferment remains disproportionately low. With less than half of Latina college students completing their degree (U.S. Department of Education, 2009), they have the lowest graduation rates compared to White, Black, and Asian female college students (Rodriguez, Guido-DiBrito, Torres, & Talbot, 2000).

This is a significant problem given that education is the key to human capital and upward social mobility. Those with a college degree have higher annual earnings, wealth, upward mobility, and better health outcomes (Arendt, 2005; Baum & Payea, 2004; Card, 1999). In fact, a Latina with a bachelor's degree earns up to 82% more than one with only a high school education (U.S. Department of Education, 1995). Recently the Obama administration set forth a national agenda to increase the number of U.S. citizens with a college education (Kelly, Schneider, & Carey, 2010). With the growing population of

Latina college students, this goal cannot be reached without stronger efforts to ensure they remain in and complete college.

Many programs have been developed to increase retention and college completion rates among the Latina/o student population. According to the American Enterprise Institute, programs that are most successful are those that engage students early in their college career (e.g., pre-matriculation summer programs) and involved some interpersonal component (e.g., peer or faculty mentorship). (Kelly, et al., 2010). Tinto and Astin (Astin, 1999; Tinto, 1987) suggest that increasing academic and social involvement and engagement among within the college campus is essential for retention, particularly among racial/ethnic minorities. Thus, a common intervention was the creation of learning communities and/or multicultural centers where students could come to do academic work as well as social and cultural activities. Although these programs may be beneficial, Latina college students are still graduating at lower rates than most non-Latina/o females (Rodriguez, et al., 2000; U.S. Department of Education, 2009).

One potential problem with existing interventions is that they appear to lack a mental health component. Latina college students report more distress and higher rates of depression and anxiety than Latinos and their non-Latina counterpaerts (Chacon, Cohen, & Strover, 1986; Contreras, Fernandez, Malcarne, Ingram, & Vaccarino, 2004; Gore & Aseltine Jr, 2003). Decades of research supports that psychological distress and mental disorders significantly interfere with persistence and performance in college (Eisenberg, Golberstein, & Hunt, 2009; R. Kessler, Foster, Saunders, & Stang, 1995). However, when individuals with mental health problems get educational and psychological assistance they have increased performance and engagement in academic activities and

they are more likely to pursue their postsecondary degree (Collins, Bybee, & Mowbray, 1998; Mowbray, Collins, & Bybee, 1999; Wilson, Mason, & Ewing, 1997). Thus, one potential approach to closing the college completion gap among Latinas is to ensure that their mental health needs are being addressed.

However, to appropriately and effectively address the mental health needs of Latina college students we have to gain a better understanding of what those needs are. There is a growing body of literature that suggests that Latina college students are an at-risk population. However, there is limited knowledge beyond evidence that Latina college students experience significant stress and distress and higher rates of depression and anxiety compared to their non-Latina counterparts. We do not have a clear understanding as to what factors influence mental health problems among Latina college students and if these factors are the same or different among White females. We also do not know if existing mental health assessment instruments are appropriate to use with Latina college students. Additionally, there is a dearth of knowledge regarding whether Latina college students with mental health problems are receiving the professional services that they need.

The following dissertation addresses the aforementioned gaps in the literature with three studies using data from a large national study of college student mental health. This dataset was particularly unique in the large number of Latina college students included. However, no further information was provided regarding sub-group ethnic identity (e.g., Mexican, Cuban, Puerto Rican, Nicaraguan), generational status, language use, or acculturation, all factors that help to define the various Latina/o subgroups. In the U.S., the term “Latina/o” is used to describe a person of Latin descent, however, there are

many different subgroups of the Latina/o population. Although Latina/o subgroups may have some communalities, they are distinct (M Alegria, Mulvaney-Day, Torres, et al., 2007; Gutierrez, Fredricksen, & Soifer, 2000) and whenever possible potential differences between Latina/o subgroups should be explored. Due to study design, Latina/o subgroups could not be identified in any of the three papers, thus "Latina" was broadly defined as any female that indicated she was "Hispanic/Latino".

The first study aimed to gain a better understanding of the mental health and substance use problems experienced by Latina college students. This was accomplished by examining the prevalence and associated risk and protective factors for depression, anxiety, drug use, and binge drinking among Latina and White female college students. White female students were included to determine if risk and protective factors were differentially related to mental health and substance use based on race/ethnicity and if there were racial/ethnic differences in the prevalence of problems. This study may provide useful information for the development and implementation of outreach and intervention programs. Specifically, whether there are differences between groups may determine the degree to which programs should be tailored to meet the specific needs of each group.

The second study was designed to determine whether an existing depression assessment instrument, the Patient Health Questionnaire-9 (PHQ-9), was an appropriate measure to use with Latina college students. Several tests were conducted examining the structure and function of the PHQ-9 among Latina and White female college students. To determine if there was a construct bias in the PHQ-9, a focused comparison of the structure and function of the measure was conducted between Latinas and Whites.

Results from these tests will not only determine whether the PHQ-9 is an appropriate measure to use with Latina college students, but also how results from the PHQ-9 should be interpreted among this population.

The third and final study was focused on understanding the degree to which Latina college students were using mental health services. In addition to examining the rate and frequency of use of mental health services, this study also explored factors related to use. Given that mental health services are most often free and readily available to college students as they are located on campus, this study allows for the examination of factors that influence service use beyond access. Results may be useful for service providers in developing targeted outreach and culturally sensitive interventions to ensure that Latinas with mental health problems are receiving appropriate and timely services.

The main purpose of this dissertation is to further knowledge regarding the mental health needs of Latina college students, an at-risk and understudied population. The immediate goal is to gather and disseminate results from these studies so they can be used to develop and innovate programs aimed at addressing the mental health problems among Latina college students. The long-term goal is to improve the quality of life among Latina college students by increasing their well-being not only as an end in and of itself, but also as a means to ensure that they complete their college education and have more opportunities to become successful contributing members of society.

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Chapter 2

Mental health and substance use among Latina and White female college students: An exploration of risk and protective factors

Abstract

Objective: The purpose of the current study was to examine the prevalence and associated risk and protective factors of mental health and substance use problems among Latina and White female college students. **Participants:** This study included a national sample of 11,071 female college students (9,797 White, 1,274 Latina). **Methods:** Data came from the Healthy Minds Study (HMS), an online survey study of college student mental health. Students were recruited from the 26 institutions that volunteered to participate. **Results:** Latinas had higher rates of depression ($p<.001$) and lower rates of drug use and binge drinking than White females. Institutional dissatisfaction and discrimination were risk factors and social support and religiosity were protective factors for mental health problems. However, these factors differentially influenced substance use problems among Latinas and White females. **Conclusions:** Latina college students may be more at-risk of mental health problems whereas Whites are more at-risk of substance use problems.

Over the past several decades the prevalence and severity of mental health problems among college students has increased nationwide (Benton, Robertson, Tseng, Newton, & Benton, 2003; Kitzrow, 2003; Pledge, Lapan, Heppner, Kivlighan, & Roehlke, 1998; Soet & Sevig, 2006). Although the growth in mental health problems on college campuses is not limited to one population, females continue to report higher rates of depression, anxiety, and eating disorders compared to males (Soet & Sevig, 2006). Even rates of binge drinking among female college students have increased over the past 30 years whereas rates among male college students have remained stable (Grucza, Norberg, & Bierut, 2009).

Among the female college student population, evidence suggests that Latinas are particularly at-risk for problems associated with mental health. Latina college students report higher levels of stress and distress than Latinos (Gandara & Osugi, 1994; Munoz, 1986) and their non-Latina counterparts (Chacon, et al., 1986; Munoz, 1986). Other studies also have found Latina college students to report higher rates of depression and anxiety than White female students (Contreras, et al., 2004; Gore & Aseltine Jr, 2003). Many factors have been identified that are associated with such problems among Latina college students including low socioeconomic status (Cuellar & Roberts, 1997), perceived racial discrimination (Hwang & Goto, 2009), and acculturation (Crockett, et al., 2007; Raffaelli, et al., 2007).

Acculturation has also been identified as a risk factor for substance use, particularly binge drinking, among Latinas (Raffaelli, et al., 2007). This is not surprising given that substance use, particularly alcohol consumption is the norm on American college campuses (O'Malley & Johnston, 2002). In fact, although Latina college students

have lower rates of binge drinking than White female students (Grucza, et al., 2009; Raffaelli, et al., 2007), over the past 30 years rates of increased binge drinking have been higher among Latina college students than White female students (Grucza, et al., 2009). Although increasing rates of binge drinking among Latinas may be due to increasing rates of acculturation, it may also be related to mental health problems experienced by Latina college students. Problematic drinking behavior is more prevalent among college students with poorer mental health, particularly females (Patterson, Lerman, Kaufmann, Neuner, & Audrain-McGovern, 2004; Weitzman, 2004). However, there is a dearth of knowledge regarding the comorbidity of mental health and substance use problems among Latina college students.

Latina college students' perceptions of their social context have also been found to influence their psychological distress and well-being. Gloria and colleagues (2005) found that when Latina college students felt that the college campus context was unsupportive or incongruent with their cultural values they reported lower psychological well-being. Several studies have shown that when Latina college students perceive their family and friends as supportive they reported experiencing less stress and distress than those who felt unsupported by their family and friends (Castillo, Conoley, & Brossart, 2004; Castillo & Hill, 2004). Although these studies provide important information about how social context may influence the well-being of Latina college students, they do not tell us how social support and institutional experiences may influence specific mental health outcomes. Furthermore, these studies only focused on Latina college students. Thus, we do not know if only Latinas experience distress when they feel that their

environment (institutional or social) is not supportive or if female college students in general have such negative responses to these types of situations.

The purpose of the current study was to address the identified gaps in the literature by examining the comorbidity and associated risk and protective factors of mental health and substance use problems among a national sample of Latina and White female college students. Findings from this study may help to identify female college students who are most at-risk of mental health and substance use problems including comorbidity. Specifically, understanding whether different factors are differentially associated with mental health and substance use problems among Latina and White female college students may have implications for development of outreach, prevention, and intervention programs. The degree to which there are differences between Latina and White females can help inform targeted interventions.

Methods

Partcipants

Data for the current analysis come from the *Healthy Minds Study* (HMS), an on-line survey study of college student mental health and well-being. In 2010, the HMS collected data from over 24,000 college students from 26 different institutions nationwide. However, given the purpose of this study only participants who identified as female and Latina/o or White, and who had complete data on the key variables of interest were included. Of the 11,071 female college students who met inclusion criteria, 88% were White (N=9,797) and 12% were Latina (N=1,274). Sociodemographic information on all participants are presented in Table 1. Most students were 18-22 years of age (71%), U.S. citizens (98%), and came from mid-level socioeconomic backgrounds (83%).

Recruitment & Procedures

The HMS was advertised to colleges and universities nationwide and any institution was eligible to participate as long as they agreed to contribute to a proportion of the cost of the study. From each institution, 4,000 students were randomly selected to receive an email invitation that included a link to the on-line survey and consent information. The survey took approximately 20 minutes to complete and all students who were contacted, regardless if they chose to participate or not, were enrolled in a drawing for a cash prize. The response rate for the full sample was 29%. Non-response is common in web-based survey design (Galea & Tracy, 2007; Porter & Umbach, 2006), however, to adjust for potential differences between responders and non-responders non-response propensity weights were created and included in all analyses. Additional information about non-response weights and recruitment and procedures for the HMS can be found elsewhere (Eisenberg, Golberstein, & Gollust, 2007). Approval was obtained from the Institutional Review Board of each of the 26 participating institutions.

Measures

Mental health and substance use

Two mental health problems and two substance use behaviors were included in this study: depression, anxiety, drug use, and binge drinking. *Depression* and *anxiety* were assessed with the Patient Health Questionnaire (PHQ) a widely used and highly validated mental health screening instrument (Spitzer, Kroenke, & Williams, 1999) based on the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition* (DSM-IV) (American Psychiatric Association, 2000). Following the recommended scoring procedures for the depression and anxiety modules, participants were classified as

meeting DSM-IV diagnostic criteria for any depressive disorder (i.e., major depression, dysthymia, or depression not otherwise specified) and/or any anxiety disorder (i.e., panic disorder, generalized anxiety disorder).

Drug use was defined as having used any illicit drugs (e.g., marijuana, heroin, cocaine, speed) within the past 30 days (Y/N). *Binge drinking* was determined based on guidelines used in previous research (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Participants were considered binge drinkers if they endorsed drinking 4 or more drinks in a row at least once within the past 2 weeks.

Sociodemographic factors

Information on age, citizenship (U.S. or non-U.S.), academic status (undergraduate or graduate student), childhood socioeconomic status (SES; low, mid-level, high), and employment (job or no job). Institution type was also included by extracting data from the National Center for Education Statistics College Navigator module that provides demographic information for every institution in the U.S. Following definitions from the U.S. Department of Education, institutions were classified as White serving, emerging Hispanic (15-24% Hispanic), and Hispanic serving ($\geq$ 25% Hispanic) institutions.

Risk factors

Institutional satisfaction and perceived discrimination were included as risk factors. *Institutional satisfaction* was determined by asking participants the degree to which they felt satisfied with the institution they were attending (satisfied/dissatisfied). *Perceived discrimination* was assessed with one question, participants were asked how

often they had been treated unfairly in the past year because of their race/ethnicity or sexual orientation. Responses were never, rarely, and frequently.

Protective factors

Family and friend social support as well as religiosity were included as protective factors. *Family and friend support* was assessed with 2 questions. That is, participants were asked whether they felt that their family supported them (Y/N) and whether their friends supported them (Y/N). Religiosity was assessed with one question that asked participants how religious they felt they were (religious, not religious).

Data Analysis

Descriptive analyses were used to obtain summary statistics including sociodemographic information and rates of mental health problems and substance use among Latina and White female college students. Group differences in all study variables were tested using chi square analyses. Phi coefficients (ϕ) were computed as measures of effect size and interpreted according to Cohen's (1988) general guidelines: .20 = small, .50 = medium, and .80 = large.

Unadjusted and adjusted logistic regression analyses were conducted to examine associations between each independent variable (e.g., sociodemographic, risk, and protective factors) and each primary outcome, depression, anxiety, drug use, and binge drinking. All adjusted analyses controlled for age, nativity, childhood SES, and institution type.

To determine racial/ethnic differences in associations, the same analyses were conducted among Latinas and Whites separately following the strategy of prior studies examining racial and ethnic differences (M Alegria, Mulvaney-Day, Torres, et al., 2007;

Gollust, Eisenberg, & Golberstein, 2008; W. A. Vega, Sribney, Aguilar-Gaxiola, & Kolody, 2004). All analyses were conducted using Stata 9.0 (StataCorp, 2009), included response propensity weights to account for survey non-response and (Eisenberg, Gollust, Golberstein, & Hefner, 2007) and utilized a robust sandwich estimator to adjust for clustering and non-independence of observations (i.e., students nested in institutions).

Results

Sample description

Table 1 displays comparisons between Latina and White female college students in sociodemographic characteristics, risk/protective factors, and mental health and substance use problems. Compared to White females, a higher proportion of Latina college students were born outside the U.S. (5.6% Latina, 1.5% White; $p < .001$), came from low SES backgrounds (7.4% Latinas, 2.0% Whites; $p < .001$), and had a job (61.6% Latinas, 58.7% Whites; $p = .04$).

Over 75% of students reported they felt supported by their family and friends. Although compared to Whites, Latinas reported lower rates of both family ($p = .0002$) and friend support ($p = .001$), however the effect sizes was negligible ($\phi = .03$). Similarly, the percentage of Latina students who reported being religious (48.8%) was higher than White females (41.2%), but with very small effect size ($\phi = .05$). There were no differences in rates of students feeling dissatisfied with their institution ($p = .166$). However, Latinas did report experiencing more frequent discrimination than Whites ($p < .001$), with a medium effect size ($\phi = .24$).

Less than a quarter of the sample reported any mental health or substance use problems with the exception of binge drinking. Nearly 50% of Whites and 40% of Latinas reported engaging in binge drinking behaviors. In addition to lower rates of binge drinking compared Whites ($p < .001$), Latinas reported lower rates of drug use ($p = .001$). No differences between groups in rates of anxiety were observed. However, Latinas (20.9%) reported higher rates of depression than White females (14.7%) ($p < .001$).

Unadjusted and adjusted logistic regression analyses were conducted to examine the association between each independent variable and each primary outcome, depression, anxiety, drug use, and binge drinking. Given that the unadjusted and adjusted estimates were nearly identical only the adjusted estimates are presented in Table 2.

Risk and protective factors

As reported in Table 2, Latinas were more at-risk for depression (AOR = 1.32, 95% CI = 1.02-1.71) compared to White females. Additionally, students who reported having a low childhood SES were more likely to experience depression and anxiety whereas those with a high childhood SES were more likely to use drugs and binge drink. Student who were dissatisfied with their institution were more likely to experience depression, anxiety, and use drugs. In fact, those who reported feeling dissatisfied with their institution were nearly three times more likely to experience depression and two times more likely to experience anxiety than those who were satisfied. Discrimination was also a risk factor for depression and anxiety. Particularly, those who experienced frequent discrimination were nearly 4 times more likely to experience depression than those who had never been discriminated against.

Cigarette use was also a risk factor mental health and substance use problems. Those who reported using cigarettes were over 2 times more likely to experience depression and anxiety, almost 6 times more likely to have used drugs, and 3 times more likely to have engaged in binge drinking than students who did not use cigarettes. Those who used drugs were also more likely to experience depression and anxiety and to binge drink. Binge drinkers were more likely to experience anxiety but not depression.

Table 2 also shows that, compared to White female students, Latinas were at less risk of drug use (AOR = 0.77, 95% CI = 0.60-0.99) and binge drinking (AOR = 0.73, 95% CI = 0.57-0.94). Students who reported they were religious were also less likely to use drugs and binge drink or experience depression or anxiety compared to those who were non-religious. Those who felt supported by their family were less likely to experience depression, anxiety, or use drugs compared to those who felt unsupported. Friend support also reduced the likelihood of experiencing depression and anxiety.

Race/ethnic differences

The separate analyses of associated risk and protective factors for mental health and substance use among Latina and White females are presented in Tables 3 & 4. Given that unadjusted and adjusted estimates were nearly the same, only adjusted estimates were reported. Tables 3 presents the adjusted associations with mental health problems and Table 4 displays the adjusted associations with substance use. Most all associations were consistent across groups. The most notable differences were in comorbidity between mental health and substance use problems and experiences of discrimination.

Among White female students, those who used cigarettes and drugs were more likely to have experienced depression and anxiety than non-users and binge drinkers were

also more likely to experience anxiety than non-binge drinkers (see Table 3). Among Latina students only cigarette use related to anxiety. In fact, Latinas who used cigarettes were less likely to experience anxiety than non-users (AOR = 0.38, 95% CI = 0.17-0.89).

Experiencing frequent discrimination was also differentially related to mental health and substance use problems among Latina and White female students. Among Whites, those who experienced frequent discrimination were more likely to experience anxiety (AOR = 2.43, 95% CI = 1.20-4.92) and use drugs (AOR = 2.06, 95% CI = 1.21-3.52) whereas discrimination was unrelated to anxiety and drug use among Latinas.

Discussion

This study examined the prevalence and associated risk and protective factors of mental health problems and substance use among Latina and White female college students. In addition to using a large national sample of female college students, this study was unique in that it was the first to explore comorbidity and the influence of social support and institutional satisfaction on mental health and substance use among Latina college students. Another strength of this study was the examination of whether identified risk and protective factors differentially influenced the mental health and substance use of Latina and White female college students, an investigation that had not been done.

Overall, findings are consistent with previous research that suggests that Latinas are less likely to use substances (Everett, et al., 1999; Grucza, et al., 2009) and more likely to experience depression (Contreras, et al., 2004) compared to White females. However, contrary to the literature (Contreras, et al., 2004; Saldana, 1995), there were no differences in rates of anxiety between Latinas and White females. Comorbidity between mental health problems and substance use was almost non-existent among Latinas, but

highly prevalent among White females. Although this difference may be due to the lower rates of substance use among Latinas, it is also possible that Latina and White female college students differentially cope with negative affect. According to the self-medication hypothesis substance use is often a means to relieve negative affective states (Khantzian, 1985). However, substance use is also highly influenced by one's environment and perceived social norms (Oetting, Donnermeryer, Trimble, & Beauvais, 1998). In the Latina/o culture, substance use is considered to be less appropriate for females (Strait, 1999), which may explain why Latinas have lower rates of substance use and comorbidity.

Potential group differences in coping with negative affect would also help explain the differential influence of social support and discrimination on drug use among Latina and White female college students. White females who felt supported by their family and friends were less likely to use drugs whereas social support was unrelated to substance use among Latinas. Findings from this study and others (Steptoe, O'Donnell, Marmot, & Wardle, 2008) suggest that when one feels more supported by their family and friends they are less likely to experience negative affect (e.g., depression). If White females are more likely to cope with negative affect by using substances then experiencing decreases in negative affect will likely lead to decreases in substance use. The same explanation could be given for why experiencing frequent discrimination was related to increased likelihood of drug use among White females, but not Latinas. Experiencing frequent discrimination increases negative affect and in an effort to cope with that negative affect White females may turn to drugs. However, the pathway between from social support and

discrimination to negative affect to substance use was not examined in the current study and future research is needed to verify such hypotheses.

Another potential explanation for observed differences between Latinas and Whites in comorbidity and differential influence of social support and discrimination on drugs use is self-report bias. There is evidence that social desirability, the degree to which individuals want to be viewed favorably by others, predicts underreporting of substance use (Johnson & Fendrich, 2005). This may be particularly problematic among Latinas for whom substance use is highly unacceptable. Future research on substance use among Latina college students should control for social desirability and/or assess Latinas' attitudes and beliefs about substance use to minimize potential self-report biases.

Religiosity and experiences of discrimination also differentially influenced mental health problems among Latina and White female college students. The fact that being religious decreased the likelihood of depression among Whites and not Latinas may be due to potential group differences in religious beliefs. Within the Latina/o culture religious beliefs often include *fatalismo* or fatalism, the belief that one has little control over life events (Cuellar, Arnold, & Gonzalez, 1995). Fatalism is considered a more negative belief-set (Abra do-Lanza, et al., 2007) and thus may not serve to protect against problems like depression. However, the measure of religiosity included in this study did not assess for fatalism or any other religious beliefs. Thus to fully understand why religiosity was differentially related to depression among Latina and White females future research is needed that includes a more comprehensive measure of religiosity.

The reason experiencing frequent discrimination was a risk factor for anxiety among White females, but not Latinas may be due to familiarity with such experiences.

Latinas had significantly higher rates of experiencing frequent discrimination than White females. Thus, Latinas may be more accustomed than White females to being treated unfairly due to their racial/ethnic background. Although being discriminated against may influence feelings of sadness and depression among Latinas, they may come to expect it and thus have less anxiety about if and when it will happen whereas White females may not. However, whether Latina female college students expect to be discriminated against and how this influences their mental health remains an empirical question.

Limitations

Despite the many strengths of this study, results should be considered in the context of the following limitations. Although many risk and protective factors among female college students were identified, this study was correlational. Thus, we cannot determine whether social support leads to better mental health or if those with better mental health have better interpersonal relationships and thus have more support. Similarly, experiencing mental health problems may lead to substance use (Khantzian, 1985), but it is also possible that substance use problems lead to mental health problems (Brook, Cohen, & Brook, 1998). Longitudinal studies, ideally that follow female college students from their first year through degree completion, would allow for the directionality of the identified relationships in this study to be examined. In addition, a longitudinal study would also help determine how mental health problems and substance are associated with retention -- a problem that is particularly salient among Latina college students (Rodriguez, et al., 2000).

This study assessed for nativity, which is often used as a proxy for acculturation (Thomson & Hoffman-Goetz, 2009). However, an actual measure of acculturation (e.g.,

Acculturation Rating Scale for Mexican Americans) was not included. Knowing whether a student was born in or outside the U.S. does not reveal the degree to which one's beliefs and practices fit within a particular cultural perspective. Previous studies have identified that acculturation is related to mental health and substance use problems among Latinas (Crockett, et al., 2007; Raffaelli, et al., 2007). However, the relative influence of acculturation on the mental health and substance use problems among Latinas in the context of other risk and protective factors such as those identified in this study is an area that needs further exploration.

Implications

Findings from this study enrich our understanding of the mental health and substance use problems experienced by female college students, particularly Latinas. Knowing the differential patterns of associations for depression and substance use among Whites and Latinas can inform the development and implementation of targeted outreach, prevention, and intervention programs. However, this study is only the beginning. Given the negative consequences of mental health and substance use problems on educational pursuits (Eisenberg, et al., 2009; R. Kessler, et al., 1995), it is essential that continued efforts be made to address the needs of female college students, particularly Latinas who have the lowest rates of degree completion (Rodriguez, et al., 2000).

Table 2.1. *Percentages and standard deviations of sociodemographics, mental health and substance use problems, and risk/protective factors among Latina and White female college students (N=11,071).*

	White (N=9,797) % (SD)	Latina (N=1,274) % (SD)	*p* (ϕ)
Sociodemographics			
Age			
18-22	71.0 (0.45)	69.3 (0.46)	0.453 (.02)
23-25	11.8 (0.32)	13.3 (0.34)	
26-30	9.7 (0.30)	10.0 (0.30)	
31+	7.5 (0.26)	7.5 (0.26)	
Nativity			
U.S.-born	98.5 (0.12)	94.4 (0.23)	0.000 (.09)
Non-U.S. born	1.5 (0.12)	5.6 (0.23)	
Childhood SES			
Low	2.0 (0.14)	7.4 (0.26)	0.000 (.12)
Mid	83.1 (0.37)	86.0 (0.35)	
High	14.9 (0.36)	6.7 (0.25)	
Institution type			
White	79.1 (0.41)	45.5 (0.50)	0.000 (.25)
Emerging Hispanic	15.1 (0.36)	23.6 (0.42)	
Hispanic	5.8 (0.23)	30.9 (0.46)	
Academic status			
Undergraduate	76.0 (0.43)	83.1 (0.37)	0.000 (.05)
Graduate	21.8 (0.41)	14.8 (0.35)	
Employment status			
Unemployed	41.4 (0.49)	38.4 (0.49)	0.043 (.02)
Employed	58.7 (0.49)	61.6 (0.49)	

	White (N=9,797) % (SD)	Latina (N=1,274) % (SD)	*p* (ϕ)
Mental health/substance use			
Depression	14.7 (0.35)	20.9 (0.41)	0.000 (.05)
Anxiety	14.1 (0.35)	13.4 (0.34)	0.508 (.01)
Drug use	21.3 (0.41)	17.4 (0.38)	0.001 (.03)
Binge drinking	48.9 (0.49)	40.8 (0.49)	0.000 (.05)
Cigarette use	14.8 (0.36)	11.5 (0.32)	0.002 (.03)
Risk factors			
Institutional satisfaction			
Satisfied	77.3 (0.42)	75.9 (0.43)	0.166 (.01)
Dissatisfied	1.4 (0.12)	1.9 (0.14)	
Discrimination			
Never	82.8 (0.38)	52.8 (0.50)	0.000 (.24)
Rarely	16.6 (0.37)	44.0 (0.50)	
Frequently	0.6 (0.08)	3.3 (0.18)	
Protective factors			
Family support			
Supportive	83.4 (0.37)	79.8 (0.40)	0.002 (.03)
Non-supportive	16.6 (0.36)	20.2 (0.38)	
Friend support			
Supportive	89.4 (0.31)	86.0 (0.35)	0.001 (.03)
Non-supportive	10.6 (0.29)	14.0 (0.32)	
Religiosity			
Religious	41.2 (0.49)	48.8 (0.50)	0.000 (.05)
Not religious	58.8(0.49)	51.2 (0.50)	

Note: SD = standard deviation. ϕ = phi coefficient; .20 = small, .50 = medium, and .80 = large effect size.

Table 2.2. *Adjusted logistic regression analysis of risk and protective factors for mental health and substance use problems among Latina and White female college students (N=11,071).*

	Depression[a]	Anxiety[a]	Drug use[b]	Binge drinking[c]
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Sociodemographics				
Age				
18-22	1.00	1.00	1.00	1.00
23-25	**0.74 (0.61-0.90)**	0.97 (0.83-1.15)	0.97 (0.76-1.24)	1.06 (0.61-1.84)
26-30	0.93 (0.71-1.23)	1.11 (0.90-1.37)	1.07 (0.83-1.39)	1.45 (0.95-2.19)
31+	0.70 (0.46-1.06)	0.72 (0.51-1.51)	0.74 (0.55-1.01)	0.57 (0.19-1.71)
Non-U.S. born	1.02 (0.61-1.70)	0.72 (0.43-1.21)	**0.29 (0.16-0.52)**	0.90 (0.59-1.38)
Childhood SES				
Low	**2.35 (1.95-2.83)**	**3.09 (2.05-4.67)**	1.39 (0.82-2.37)	0.83 (0.53-1.31)
Mid	1.00	1.00	1.00	1.00
High	0.85 (0.68-1.06)	0.93 (0.81-1.08)	**1.28 (1.13-1.45)**	**1.59 (1.40-1.82)**
Race/ethnicity				
White	1.00	1.00	1.00	1.00
Hispanic/Latina	**1.32 (1.02-1.71)**	0.85 (0.70-1.04)	**0.77 (0.60-0.99)**	**0.73 (0.57-0.94)**
Institution type				
White	1.00	1.00	1.00	1.00
Emerging Hispanic	1.09 (0.70-1.70)	1.01 (0.74-1.38)	0.77 (0.55-1.08)	0.90 (0.63-1.27)
Hispanic	1.19 (0.96-1.47)	0.95 (0.76-1.19)	0.84 (0.59-1.18)	0.81 (0.52-1.26)
Protective factors				
Family support	**0.33 (0.30-0.37)**	**0.43 (0.36-0.51)**	**0.68 (0.56-0.82)**	0.93 (0.84-1.03)
Friend support	**0.32 (0.26-0.39)**	**0.44 (0.35-0.54)**	0.85 (0.71-1.03)	1.08 (0.93-1.26)
Religiosity	**0.78 (0.65-0.94)**	**0.73 (0.63-0.85)**	**0.37 (0.29-0.46)**	**0.53 (0.41-0.67)**
Risk factors				
Dissatisfaction w/institution	**2.95 (2.48-3.53)**	**2.06 (1.79-2.37)**	**1.19 (1.00-1.43)**	0.96 (0.82-1.14)
Discrimination				
Never	1.00	1.00	1.00	1.00
Rarely	**1.45 (1.21-1.73)**	**1.63 (1.31-2.02)**	1.20 (1.03-1.41)	1.02 (0.92-1.13)
Frequently	**3.81 (2.36-6.15)**	1.73 (0.98-3.05)	1.75 (1.00-3.05)	0.89 (0.54-1.49)
Cigarette use	**2.34 (1.95-2.83)**	**2.61 (2.10-3.23)**	**5.73 (4.49-7.31)**	**3.04 (2.42-3.83)**
Drug use	**1.71 (1.41-2.08)**	**1.86 (1.62-2.14)**		**5.98 (5.11-6.99)**
Binge drinking	1.01 (0.88-1.17)	**1.19 (1.08-1.31)**	**5.98 (5.11-6.99)**	

Note: AOR = adjusted odds ratio. CI = confidence intervals. All models adjusted for age, childhood SES, citizenship, and type of institution. Ref variables = 1.00. Bolded values = statistically significant (CI does not include 1.0). a. Ref = no symptoms. b. Ref = no drug use (past 30 days). c. Ref = no binge drinking in past 2 weeks.

Table 2.3. *Adjusted logistic regression analysis of risk and protective factors for mental health problems: separate analysis for Latina (N=1,274) and White female college students (N=9,797).*

	Depression[a]		Anxiety[a]	
	White AOR (95% CI)	Latina AOR (95% CI)	White AOR (95% CI)	Latina AOR (95% CI)
Sociodemographics				
Age				
18-22	1.00	1.00	1.00	1.00
23-25	**0.74 (0.61-0.90)**	0.97 (0.50-1.88)	0.97 (0.76-1.24)	1.06 (0.61-1.84)
26-30	0.93 (0.71-1.23)	0.77 (0.39-1.51)	1.07 (0.83-1.39)	1.45 (0.95-2.19)
31+	0.70 (0.46-1.06)	0.73 (0.35-1.51)	0.74 (0.55-1.01)	0.57 (0.19-1.71)
Non-U.S. born	0.73 (0.33-1.63)	1.40 (0.86-2.28)	0.55 (0.30-1.02)	1.24 (0.49-3.16)
Childhood SES				
Low	**1.98 (1.56-2.52)**	**2.65 (2.06-3.41)**	**3.40 (2.17-5.32)**	**2.69 (1.04-6.92)**
Mid	1.00	1.00	1.00	1.00
High	0.82 (0.64-1.05)	1.48 (0.83-2.67)	0.93 (0.79-1.08)	0.94 (0.46-1.92)
Institution type				
White	1.00	1.00	1.00	1.00
Emerging Hispanic	0.93 (0.59-1.47)	1.58 (0.84-2.97)	0.96 (0.68-1.35)	**1.51 (1.06-2.15)**
Hispanic	1.12 (0.89-1.41)	1.20 (0.86-1.69)	1.04 (0.76-1.43)	1.11 (0.73-1.68)
Protective factors				
Family support	**0.34 (0.30-0.38)**	**0.31 (0.25-0.39)**	**0.42 (0.36-0.50)**	**0.48 (0.34-0.69)**
Friend support	**0.33 (0.27-0.40)**	**0.25 (0.15-0.41)**	**0.44 (0.36-0.55)**	**0.38 (0.19-0.77)**
Religiosity	**0.74 (0.59-0.92)**	0.98 (0.71-1.35)	**0.73 (0.62-0.86)**	**0.74 (0.57-0.97**
Risk factors				
Dissatisfaction w/institution	**3.07 (2.60-3.63)**	**2.42 (1.65-3.56)**	**2.14 (1.84-2.49)**	**1.65 (1.00-2.75)**
Discrimination				
Never	1.00	1.00	1.00	1.00
Rarely	**1.55 (1.31-1.83)**	1.03 (0.77-1.38)	**1.80 (1.47-2.21)**	1.32 (0.82-2.14)
Frequently	**3.26 (1.76-6.05)**	**3.75 (1.69-8.33)**	**2.43 (1.20-4.92)**	1.17 (0.36-3.86)
Cigarette use	**2.48 (2.07-2.97)**	1.60 (0.87-2.94)	**2.83 (2.30-3.50)**	**0.38 (0.17-0.89)**
Drug use	**1.84 (1.51-2.24)**	1.11 (0.81-1.53)	**1.91 (1.66-2.21)**	1.44 (0.85-2.43)
Binge drinking	1.03 (0.87-1.24)	0.98 (0.77-1.26)	**1.16 (1.04-1.30)**	1.36 (0.97-1.93)

Note: AOR = adjusted odds ratio. CI = confidence intervals. All models were adjusted for age, childhood financial status, citizenship, and type of institution. Reference variables are indicated with a 1.00. All values in bold are statistically significant based on an confidence interval that does not include the value 1.0.
a. Reference = no clinically significant symptoms.

Table 2.4. *Adjusted logistic regression analysis of risk and protective factors for substance use: separate analysis for Latina (N=1,274) and White female college students (N=9,797).*

	Drug use[a]		Binge drinking[b]	
	White AOR (95% CI)	Latina AOR (95% CI)	White AOR (95% CI)	Latina AOR (95% CI)
Sociodemographics				
Age				
18-22	1.00	1.00	1.00	1.00
23-25	**0.58 (0.42-0.79)**	**0.49 (0.27-0.88)**	1.03 (0.79-1.33)	1.05 (0.79-1.39)
26-30	**0.57 (0.42-0.79)**	**0.31 (0.15-0.66)**	0.86 (0.66-1.11)	0.93 (0.54-1.59)
31+	**0.12 (0.07-0.19)**	**0.45 (0.20-1.02)**	**0.24 (0.17-0.35)**	0.54 (0.18-1.66)
Non-U.S. born	**0.30 (0.15-0.59)**	**0.32 (0.13-0.81)**	0.91 (0.51-1.61)	1.04 (0.53-2.08)
Childhood SES				
Low	1.54 (0.85-2.84)	1.32 (0.54-3.21)	1.06 (0.66-1.71)	0.62 (0.31-1.23)
Mid	1.00	1.00	1.00	1.00
High	**1.26 (1.10-1.44)**	1.36 (0.77-2.41)	**1.58 (1.37-1.82)**	1.31 (0.74-2.29)
Institution type				
White	1.00	1.00	1.00	1.00
Emerging Hispanic	0.76 (0.54-1.07)	0.91 (0.60-1.37)	1.00 (0.66-1.52)	0.63 (0.39-1.02)
Hispanic	1.07 (0.75-1.53)	0.66 (0.43-1.00)	0.97 (0.58-1.60)	**0.69 (0.51-0.92)**
Protective factors				
Family support	**0.63 (0.52-0.76)**	1.24 (0.80-1.92)	0.92 (0.81-1.03)	1.05 (0.68-1.60)
Friend support	**0.81 (0.68-0.96)**	1.23 (0.71-2.14)	1.00 (0.85-1.18)	1.65 (0.99-2.73)
Religiosity	**0.36 (0.28-0.47)**	**0.41 (0.29-0.58)**	**0.51 (0.39-0.66)**	**0.67 (0.51-0.88)**
Risk factors				
Dissatisfaction w/institution	1.21 (1.00-1.46)	1.10 (0.61-1.99)	0.96 (0.78-1.19)	1.02 (0.66-1.57)
Discrimination				
Never	1.00	1.00	1.00	1.00
Rarely	**1.34 (1.14-1.58)**	0.86 (0.51-1.46)	1.07 (0.97-1.19)	0.99 (0.75-1.31)
Frequently	**2.06 (1.21-3.52)**	1.41 (0.50-3.95)	1.47 (0.84-2.58)	0.53 (0.23-1.23)
Depression	**1.83 (1.51-2.23)**	1.10 (0.80-1.52)	1.04 (0.87-1.24)	0.98 (0.77-1.26)
Anxiety	**1.91 (1.66-2.21)**	1.44 (0.86-2.42)	**1.17 (1.04-1.30)**	1.36 (0.90-2.06)

Note: AOR = adjusted odds ratio. CI = confidence intervals. All models were adjusted for age, childhood financial status, citizenship, and type of institution. Reference variables are indicated with a 1.00. All values in bold are statistically significant based on an confidence interval that does not include the value 1.0. a. Reference = no drug use in past 30 days. b. Reference = no binge drinking in past 2 weeks.

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Chapter 3

Examination of the structure and function of the Patient Health Questionnaire (PHQ-9) among Latina and White female college students

Abstract

Objective: The purpose of the current study was to examine the structure and function of the Patient Health Questionnaire-9 (PHQ-9) in a large national sample of Latina and White female college students (N = 16,754). **Methods:** Using the random split sample method exploratory (EFA) and confirmatory factor analyses (CFA) were conducted to determine the structure of the PHQ-9. To determine whether the identified structure and function of the PHQ-9 was consistent across Latina and White female college students, a multiple group confirmatory factor analysis (MGCFA) was employed. **Results:** The EFA revealed a two-factor structure of the PHQ-9, representing affective and somatic dimensions of depression. Results of the CFA confirmed that the two-factor structure of the PHQ-9 was a good fit for the data (RMSEA = 0.064, TLI = 0.984, and CFI = 0.990). The MGCFA confirmed that the identified structure and function of the PHQ-9 did not differ between Latina and White female college students. **Conclusions:** The PHQ-9 can be used as a multidimensional assessment of depression among female college students without concern of a construct bias This distinction may be important for screening, diagnosis, and treatment of depression among female college students, particularly Latinas who are at-risk for depression.

According to the National Institute of Mental Health, depression is the leading cause of disease-related disability in the U.S. (National Institute of Mental Health, 2010), particularly among females who are twice as likely as males to experience depression (R. C. Kessler, 2003). To decrease the prevalence and disease burden of depression among females in the U.S., greater efforts have to be made at increasing early and accurate detection. The sooner that depressive symptoms are identified and treated, the lower the likelihood of severe impaired functioning and future relapse.

Given that the onset of depression typically occurs during young adulthood (R. C. Kessler, et al., 2005), the college female population is ideal for targeted interventions. However, in order to effectively intervene there is a need for an accurate and efficient method to assess for depressive symptoms among female college students, particularly Latinas who are higher risk of depression than their non-Latina counterparts (Contreras, et al., 2004; Gore & Aseltine Jr, 2003). Although many depression measures have been developed and utilized over the past several decades, there is little information regarding the use of these measures among female college students in general and Latinas specifically.

One study examined the validity and compared the diagnostic performance of the Beck Depression Inventory-II (BDI-II), the Center for Epidemiological Studies-Depression Scale (CES-D), and the Self-Rating Depression Scale (SDS) among Latina/o college students (Kanagui, Rico, Castellanos, & Gloria, 2009). Kanagui and colleagues (2009) found that overall the BDI-II was the most effective of the 3 scales at assessing depression among Latina/o college students. However, this study did not account for potential gender differences and it did not include the Patient Health Questionnaire-9

(PHQ-9) (Spitzer, et al., 1999), a depression measure that has been widely used and validated among diverse populations. The structure and the function of the items of the PHQ-9 have been found to be the same across African American, Chinese American, Latina/o, and non-Hispanic Whites (Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006). The PHQ-9 has also been found to be a reliable measure of depression among Spanish speaking Latina/os (Wulsin, Somoza, & Heck, 2002). However, these studies were limited to adults in the primary care setting.

In fact, the PHQ-9 was originally developed to assess for depression among patients in primary care setting. Given the need to make quick and accurate diagnosis in this type of environment the PHQ-9 was designed to be brief, unidimensional, and easy to score measure of depression based on criteria from the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition* (DSM-IV) (American Psychiatric Association, 2000). In addition to identifying clinically significant depressive symptoms, recent studies have shown that the PHQ-9 may also be used to gain a better understanding of the multidimensionality of depression. Richardson and Richards (2008) examined the structure of the PHQ-9 in a sample of individuals with spinal cord injuries and found evidence for a two-factor model that included one subscale characterized by affective symptoms and the other by somatic symptoms. Other studies have also supported this two-factor model of the PHQ-9 (J. S. Krause, Reed, & McArdle, 2010).

Given that the PHQ-9 can be used to assess for clinical symptoms among diverse populations, particularly Latina/os, in a short period of time it may be particularly ideal for assessing depression among Latina college students. Although the PHQ-9 has been used to study depression among college students (Eisenberg, Gollust, Golberstein, &

Hefner, 2007; Ellis & Trumpower, 2008), only one study has examined the validity of this measure in the college student population. Adewuya and colleagues (2006) confirmed that the PHQ-9 was a valid measure of depression among college students. However, this study only included Nigerian students and did not examine the factor structure of the measure.

Although female college students, particularly Latinas, are an at-risk group for depression (Contreras, et al., 2004), to date no studies have explored the use of the PHQ-9 within this population. To address this gap in the literature the current study aimed to examine the factor structure of the PHQ-9 among female college students as well as conduct focused comparisons of the measure between Latina and White females to determine if any construct bias' existed. Understanding how to appropriately use and interpret findings from the PHQ-9 among female college students may help clinicians be better equipped to detect and treat depression in this at-risk population, which may ultimately have implications for decreasing the disease-burden of depression among women in the U.S.

Methods

Sample

Data for the present analysis came from the Healthy Minds Study (HMS), a survey study of college student mental health and mental health service utilization. The HMS includes data on over 36,000 college students from over 50 institutions across the nation collected over a four-year period. Given the focus of the current study, to examine the use of the PHQ-9 among female college students, particularly Latinas, only participants who indicated that they were female and of White or Hispanic decent were

included (N=17,806). Due to missing data on key variables of interest the final sample included 16,754 participants, 1,455 Latina and 15,229 White female college students. To allow for particular analyses in the study, the sample was randomly split into two sub-samples containing 8,337 participants in each. Table 1 displays sociodemographic information of participants based on the analysis they were included in. The sample was predominantly White (91%), ranging in age from 18-22 years (67%), and from mid-level socioeconomic backgrounds (57%).

Procedure

The HMS was widely advertised and any college or university that wanted to participate was eligible as long as they agreed to contribute to the financial cost of collecting the data. Participants were randomly selected from each school and were sent emails containing information about the study and a link to the survey. Informed consent was obtained from all participants before participation. In addition to the PHQ-9, the survey included a wide range of assessments for mental health and substance use problems, service utilization, and other factors related to the college student experience. The entire survey took approximately 20 minutes to complete. Less than 50% of the contacted students responded. For more details regarding study procedures see Eisenberg, Gollust, et al. (2007). The study received approval from the Internal Review Board of all institutions that volunteered to participate.

Measures

Patient Health Questionnaire-9. The PHQ-9 is a 9-item self-report measure of depression based on DSM-IV diagnostic criteria for major depressive disorder. Participants are asked "over the LAST 2 WEEKS, how often have you been bothered by

any of the following problems?" Example items include, "Little interest or pleasure in doing things," "Feeling down, depressed or hopeless," "Feeling tired or having little energy," and "Feeling bad about yourself—or that you are a failure or have let yourself or your family down." Responses ranged from 0 (not at all) to 3 (nearly every day).

Total depression scores ranging from 0 to 27 were calculated using standard algorithms proposed by the original authors (Spitzer, et al., 1999). Scores from 10-14 were indicative of mild depressive symptoms (e.g., dysthymia), 15-19 moderate depressive symptoms, and greater than 19 major depression. This instrument has proven to be a valid and reliable assessment of depression across many populations (Diez-Quevedo, Rangil, Sanchez-Planell, Kroenke, & Spitzer, 2001; Huang, et al., 2006; Kroenke, Spitzer, & Williams, 2001; Lowe, et al., 2004).

Data Analysis

All analyses were conducted using Mplus 6.11 (L. Muthen & Muthen, 1998-2010) using weighted least squares estimation (WLSM). Data on the PHQ-9 were highly skewed and violated the assumptions of maximum likelihood estimation. Thus, data were treated as ordered-categorical and WLSM is the most appropriate estimator for working with ordinal data from large samples ($N \geq 800$) (Boomsma & Hoogland, 2001).

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted in this study. To perform both analyses within the same study, and ensure that no participants were included in both, the overall sample was randomly split into two subsamples. The EFA with an oblimin rotation was conducted with one half sample and the CFA as well as a multiple-group confirmatory factor analysis (MGCFA) was conducted on the other half.

The MGCFA was used to test for a potential construct bias in the PHQ-9 when applied to a Latina college student population. This analysis involved performing increasingly stringent tests of measurement invariance between White female and Latina college students to determine the degree to which the structure and function of the PHQ-9 was consistent across the two groups.

Following recommendations from Muthen & Christoffersson (1981) two tests of measurement invariance were performed. For the first test, known as the baseline model, the least amount of constraints were placed on parameters (e.g., allowing factors loadings and thresholds to be freely estimated) and then the fit of the model was examined. This analysis was used to determine whether the factor structure of the mean PHQ-9 was a good fit across Latina and White female college students. However, establishing that the factor structure of the target measure is the same across groups is considered a weak measure of invariance (Meredith, 1993). Just because the structure of a measure is the same across groups does not mean that the measure functions the same in those groups. Establishing that a measure functions similarly across groups allows for any observed between-group differences to be attributed to real group differences rather than an artifact of the measure.

Thus, a second test was employed to determine if the PHQ-9 functioned the same among Latina and White female college students. This test required placing more constraints on parameters (Byrne, Shavelson, & Muthen, 1989). Specifically, using delta parameterization, factor loadings and thresholds were held constant, scale factors were fixed to one, and factor means were fixed to zero (B. Muthen & Christoffersson, 1981) across White female and Latina college students. Setting all parameters to be equal across

groups allows for the examination of model fit if the measure functioned in the exact same way across groups, thus why this method is considered a strong test of measurement invariance.

Finally to determine whether the stronger model of measurement invariance was a better fit for the data than the baseline model, chi-square difference tests were conducted using the DIFFTEST function in Mplus 6.1.

Model fit was based on conceptual fit as well as standard empirical indices including the Root Mean Squared Error Approximation (RMSEA), Tucker-Lewis Index (TLI), and Comparative Fix Index (CFI). RMSEA scores ranging between 0.05-1.0 were considered acceptable with those closer to 0 indicating better fit. TLI and CFI scores greater than 0.90 were considered adequate, however scores greater than 0.95 were most desirable (Browne & Cudeck, 1993; Hu & Bentler, 1995).

Results

Overall sample characteristics are presented in Table 1. There were no significant differences between the random split-half samples used in the EFA and CFA. However, there were racial/ethnic differences. On average, Latinas were older (t (16,746) = -3.21, p > .01), had lower socioeconomic status growing up (t (16,738) = 22.19, p > .0001), and had lower enrollment in graduate school compared to their White counterparts (t (16,691) =2.24, p > .05).

Table 2 shows the means and intercorrelations for all PHQ-9 items. Again, there was evidence of differences between Latinas and White females. According to results from a Mann-Whitney U test, Latina college students, on average, were higher in all PHQ-9 items (e.g., suicidality U=-3.24, p < .001).

Exploratory factor analysis

Results from the EFA provided support for a two-factor model of the PHQ-9 among White female and Latina college students. Factors loadings are displayed in Table 3. Following Tabachnick & Fidell's (2001) guidelines, items were that loaded > 0.40 on one factor and < 0.20 on the other were recognized as good indicators of an underlying factor. Four items that were characteristic of affective symptoms of depression (e.g., feeling depressed, suicidal, disinterest/bored) loaded on one factor, 3 items representative of somatic symptoms (e.g., tired, irregular eating, irregular sleeping) loaded on the other factor, and 2 items crossloaded (e.g., trouble concentrating, irregular activity level). All fit indices supported that this two-factor structure was a good fit for the data (RMSEA = 0.071, TLI = 0.97, CFI = 0.99).

Items that crossloaded were removed and another EFA was conducted with only the 7 remaining items. This modified EFA further supported a two-factor structure with stable factor loadings and improved fit indices (e.g., RMSEA = 0.058). Descriptive statistics for the two factors are presented in Table 3. Both factors had good internal consistency ($\alpha = 0.77$) and were significantly related to meeting DSM-IV diagnostic criteria for any depressive disorder (Affect: $r = 0.72$; $p < .0001$, Somatic: $r = 0.51$; $p < .0001$) and seeking professional mental health treatment in the past year (Affect: $r = 0.20$; $p < .0001$, Somatic: $r = 0.13$; $p < .0001$).

Confirmatory and multiple-group confirmatory factor analysis

To confirm that the two-factor model was a good fit for the data, a CFA was conducted on the other half of the sample (N=8,377). Figure 1 shows the standardized factor loadings and error terms for each item. All loadings were greater than 0.70 and fit

indices were satisfactory (e.g., RMSEA = 0.064, TLI = 0.984, and CFI = 0.990), supporting the two-factor model of the PHQ-9 among female college students.

Although the EFA and CFA established support for the two-factor model, a MGCFA was employed to examine if this model was equally fitting for Latina college students. Specifically, tests of measurement invariance were conducted to determine whether there was a construct bias in the PHQ between Latinas and White females. Table 4 displays the MGCFA results, specifically the fit of the factor structure and invariance of the measure across groups.

In the baseline model, where factor loadings and thresholds were freely estimated across Latinas and White females, there was evidence of measurement invariance. Fit indices indicated that the two-factor structure of the PHQ-9 was a good fit for Latinas and White females, RMSEA = 0.062, TLI = 0.985, and CFI = 0.991.

In the more strict test of invariance, where all parameters (e.g., factor loadings, thresholds, factor scales, factor means) were set to be equal across groups to determine if the measure functioned in the exact same way. This model showed good fit to the data (e.g., RMSEA = 0.038) suggesting that the two-factor PHQ-9 was invariant between Latina and White female college students. According to a chi-square difference test, this model exhibited a significantly better fit than the baseline model (Δx^2 =242.49 Δdf = 26, $p < .001$).

Discussion and Implications for Practice

The purpose of this study was to gain a better understanding of the structure and function of the PHQ-9, a validated depression assessment instrument, among female college students. Early and accurate detection of depression among young adult females

may help reduce the significant disease burden of depression among women in the U.S. However, to achieve this goal it is essential that researchers and clinicians have a clear understanding of how to use and interpret the different depression measures within target populations. Results from this study suggest that it is best to use a two-factor model of the PHQ-9 that includes affective and somatic symptomatology when working with female college students and that this model is just as appropriate for Latina students as it is for Whites.

Results from this study are consistent with theory, research, and practice that suggests that depression is multidimensional. It has been well established that depressive symptoms can be categorized into various clusters including but not limited to cognitive, affective, somatic, and/or behavioral symptomatology (Beck, 1979). Thus, many measures of depression include subscales that assess for the various symptom clusters (e.g., Beck Depression Inventory, Hamilton Depression Rating Scale, Center for Epidemiologic Studies Depression Scale). Although the PHQ-9 is typically considered a unidimensional measure of depression, the current study found evidence that it may also be used as a multidimensional measure of depression among female college student populations.

Findings from this study also support previous research that uncovered a two-factor model of the PHQ-9 among individuals with spinal cord injuries (SCI) (J. S. Krause, Bombardier, & Carter, 2008; Richardson & Richards, 2008). Although female college students and individuals with SCI may differ greatly in many respects, the fact that affective and somatic symptoms of the PHQ-9 were found to be distinct subscales of depression in both populations may be due to the fact that among these two populations

somatic symptoms may be considered the rule rather than the exception. Particularly, somatic complaints such as those included in the PHQ-9 (e.g., eating poorly, sleeping irregularly, lacking energy/feeling tired) are so common among college females they are considered the norm (Buboltz, Brown, & Soper, 2001; Davy, Benes, & Driskell, 2006). In fact, in the current study female college students, on average, had higher scores on the somatic subscale than on the affective subscale.

This study also provides further evidence that the PHQ-9 is a racially/ethnically unbiased measure of depression. The PHQ-9 has been identified as a valid assessment of depression among individuals from many different racial/ethnic backgrounds (Huang, et al., 2006). However, this was the first study to specifically examine this measure among young adult Latinas. Finding full measurement invariance between White female and Latina college students on the PHQ-9, meaning that the structure and function of the measure was the same across groups, allowed for more meaningful interpretation of observed differences in depressive symptoms. Specifically, these results helped to confirm that Latinas' higher reported rates of depressive symptomatology compared to White females was due to real group differences rather than just an artifact of the measure.

Although the current study supports the use of a two-factor model of the PHQ-9 among female college students, this does not mean that the unidimensional model of the PHQ-9 is invalid. Rather, these findings suggest that when working with female college students it is essential to not only consider quantity of affective and somatic symptoms, but also the nature of these symptoms. As previously mentioned, somatic symptoms are very common among female college students and they may not always be indicative of

depression. Given the time constraints that many clinicians are under in the college campus context the unidimensional model of the PHQ-9 is a helpful tool for quickly assessing depressive symptoms. However, it is possible that failing to carefully explore whether endorsed symptoms, particularly those that are somatic, are pathological or more normative among female college students may lead to misdiagnoses and/or improper treatment of depression. Future studies that examine the use and interpretation of the PHQ-9 in campus counseling centers and that explore the rate of misdiagnosis of depression among female college students using this instrument are needed.

Findings from this study have the potential to contribute to increased knowledge of the use PHQ-9 to assess for depression in non-clinical samples, of racial/ethnic differences in the measurement and presentation of depressive symptoms, and methods to increase accurate and timely detection, diagnoses, and treatment of depression. .

The results and implications of this study must be considered in the context of the following limitations. First, it is possible that the two-factor structure and function of the PHQ-9 was invariant among Latina and White female college students because of the relative homogeneity of the college student population. However, in this sample of college students there were differences between groups that would suggest that they were not homogenous. Particularly, more Latina students were older and came from lower SES backgrounds, and Latinas had significantly higher rates of depressive symptoms than their White counterparts. Future studies that examine the PHQ-9 in community-based samples of Latina and White young adult females would help to further clarify the impact of the homogeneity of the sample on measurement invariance.

Another limitation in this study was that the depression data was highly positively skewed. Although female college students, particularly Latinas, are at increasing risk of depression, overall only a small percentage present with clinically significant symptoms. The structure and function of the PHQ-9 may differ between a general female college student sample and more clinical student samples. Future studies that compare the structure and function of the PHQ-9 between non-clinical and clinical samples of female college students may provide a deeper understanding of depression symptomatology among female college students and how the PHQ-9 can be used within various populations.

Despite these limitations, the results from this study have the potential to improve research and practice in the field of depression. Understanding how the PHQ-9 functions among female college students and knowing that it is an appropriate measure for racial/ethnic minorities such as Latinas may help to increase the accuracy of administration and interpretation of the measure. Improving detection and diagnosis of depression among female college students, particularly Latinas, may not only be extremely helpful for clinicians (e.g., clinical social workers, psychologists, psychiatrists) in providing proper referrals and treatment, but may also contribute to decreasing the prevalence and incredible disease burden of depression among women in the U.S.

Table 3.1. *Participant characteristics and sociodemograhics from each of the three analyses: exploratory and confirmatory factor analysis and multiple-group confirmatory factor analysis.*

	Exploratory Factor Analysis (N=8,377)		Confirmatory Factor Analysis (N=8,377)		Multi-group Confirmatory Factor Analysis (N=16,754)			
					White		Latina	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Race/ethnicity								
White	7,638	91	7,661	91	15,299	91		
Latina/o	739	9	716	9			1,455	9
Age								
18-22	5,725	68	5,767	69	10,549	69	943	65
23-25	1,026	12	1,032	12	1,867	12	191	13
26-30	852	10	862	10	1,551	10	163	11
30+	770	9	714	9	1,326	9	158	11
Degree type								
Undergraduate	6,197	74	6,190	74	11,224	73	1,163	80
Graduate	1,852	22	1,901	24	3,503	23	250	17
SES								
Low	2,557	31	2,476	30	318	2	111	8
Mid	4,687	56	3,814	57	12,848	84	1,257	86
High	1,123	13	1,083	13	2,119	14	87	6
Depression	1,292	15	1,289	15	2,257	15	324	22

Table 3.2. *Means, standard deviations, and item correlations for the PHQ-9 among White female and Latina college students.*

	Mean (SD)										
	Whites (N=15,299)	Latinas (N=1,455)	1	2	3	4	5	6	7	8	9
1. Little interest or pleasure in doing things	0.65 (0.75)	0.80 (0.84)	--	0.65	0.49	0.52	0.48	0.54	0.51	0.44	0.45
2. Feeling down, depressed or hopeless	0.74 (0.76)	0.82 (0.82)	0.72	--	0.56	0.60	0.56	0.72	0.55	0.51	0.68
3. Trouble with sleep	1.06 (0.98)	1.15 (1.05)	0.47	0.49	--	0.66	0.58	0.47	0.49	0.46	0.44
4. Feeling tired or having little energy	1.29 (0.88)	1.40 (0.94)	0.53	0.54	0.63	--	0.65	0.49	0.50	0.46	0.44
5. Poor appetite or overeating	0.91 (0.94)	1.05 (1.03)	0.42	0.51	0.53	0.60	--	0.52	0.51	0.54	0.44
6. Feeling bad about yourself	0.66 (0.84)	0.77 (0.93)	0.51	0.72	0.44	0.48	0.56	--	0.60	0.53	0.65
7. Trouble concentrating on things	0.66 (0.86)	0.75 (0.92)	0.59	0.54	0.48	0.52	0.52	0.56	--	0.66	0.46
8. Moving or speaking too slow or too fast	0.26 (0.60)	0.34 (0.70)	0.50	0.51	0.46	0.45	0.50	0.51	0.62	--	0.48
9. Suicidal thoughts	0.12 (0.41)	0.17 (0.51)	0.55	0.68	0.42	0.41	0.45	0.67	0.48	0.52	--

Note: Correlations under the diagonal represent White female college students whereas those above the diagonal represent Latinas. All correlations are polychoric and significant at the $p > .001$ level.

Table 3.3. *Exploratory factor analysis of the PHQ-9 among female college students* (N=8,377)

	One factor	Two factors		Adjusted two factors	
	Depression	Affect	Somatic	Affect	Somatic
Feeling down, depressed or hopeless	0.840	**0.895**	-0.002	**0.916**	
Suicidal thoughts (or thoughts of hurting yourself in some way)	0.699	**0.809**	-0.074	**0.795**	
Feeling bad about yourself (e.g., failure or have let yourself or your family down)	0.776	**0.742**	0.078	**0.726**	
Little interest or pleasure in doing things	0.770	**0.654**	0.161	**0.642**	
Feeling tired or having little energy	0.749	-0.017	**0.839**		**0.865**
Trouble with sleep (e.g., falling asleep, staying asleep, or sleeping too much)	0.698	0.010	**0.744**		**0.698**
Poor appetite or overeating	0.714	0.156	**0.617**		**0.583**
Trouble concentrating on things (reading the newspaper or watching television)	0.716	0.397	0.375		
Moving or speaking too slow or too fast	0.698	0.350	0.401		
Mean (SD)	13.76 (4.40)			6.20 (2.22)	6.29 (2.33)
α	0.85			0.77	0.77
r				0.62	
x^2 (df)	2,400.67 (27)	827.60 (19)		235.13 (8)	
RMSEA	0.102	0.071		0.058	
TLI	0.946	0.974		0.987	
CFI	0.960	0.986		0.995	

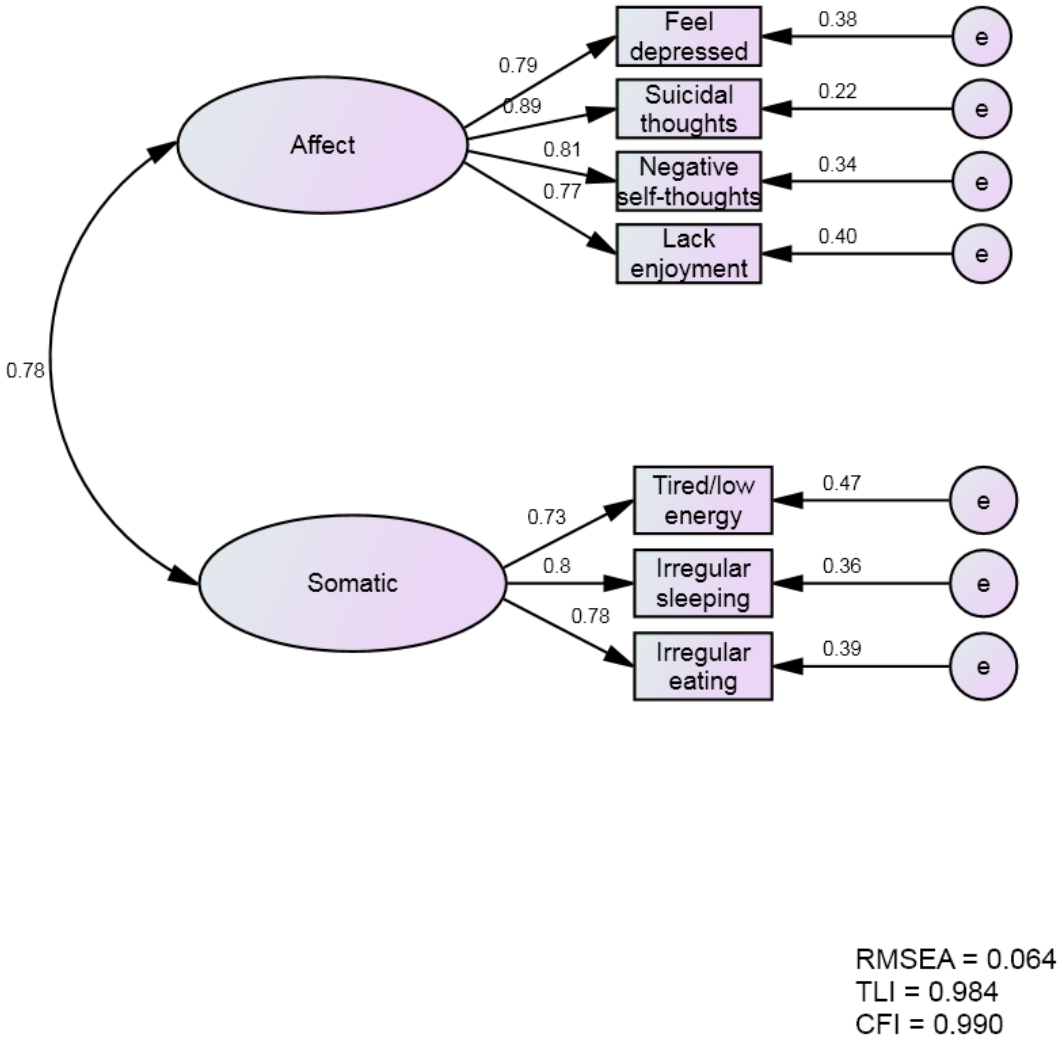
Note: Weighted least squares estimation was employed. Bolded items indicate high loading on the corresponding factor. Last two items cross-load and were dropped from the EFA and adjusted outcomes are reported

Table 3.4. *Measurement invariance and model fit indices from the multiple-group confirmatory factor analyses of the 2-factor PHQ-9 among Latina* (1,455) *and White female* (15,299) *college students.*

	Baseline[a]		Full invariant model[c]	
	White (N=15,299)	Latina (N=1,455)	White (N=15,299)	Latina (N=1,455)
Affect				
λ_1 Little interest or pleasure in doing things	1.000*	1.000*	1.000*	1.000*
λ_2 Feeling down, depressed or hopeless	1.106	1.242	1.118*	1.118*
λ_6 Feeling bad about yourself, failure, let family down	1.009	1.081	1.015*	1.015*
λ_9 Thoughts that you would be better off dead or hurting oneself	0.939	1.000	0.944*	0.944*
σ_1	0.640	0.530	0.633	0.600
σ_2	0.783	0.816	0.790	0.750
σ_6	0.652	0.619	0.652	0.619
σ_9	0.565	0.529	0.564	0.535
σ_{factor}	0.640	0.530	0.633	0.600
Somatic				
λ_3 Trouble falling asleep or staying asleep, or sleeping too much	1.000*	1.000*	1.000*	1.000*
λ_4 Feeling tired or having little energy	1.098	1.073	1.095*	1.095*
λ_5 Poor appetite or overeating	1.047	1.000	1.042*	1.042*
σ_3	0.538	0.605	0.540	0.581
σ_4	0.648	0.696	0.648	0.697
σ_5	0.589	0.605	0.586	0.630
σ_{factor}	0.538	0.605	0.540	0.581
r	0.460	0.456	0.458	0.476
x^2	867.17		694.10	
df	26		52	
Δx^2			242.49	
Δdf			26	
p			< 0.001	
RMSEA	0.062		0.038	
TLI	0.985		0.994	
CFI	0.991		0.993	

Note: * indicates items were fixed, λ = unstandardized factor loadings, σ = variance, r = correlation between factors. Scale factors were fixed to 1 and factor means were fixed to 0 across both groups for all analyses. a. Factor loadings and thresholds were freely estimated. b. Thresholds were freely estimated. c. All parameters were equivalized across groups

Figure 3.1. *CFA figure*



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Chapter 4

Mental health service use among Latina college students:

Results from a nationwide survey

Abstract

Latina college students commonly present with high rates of distress and psychological symptomatology. However, the extent to which these students receive mental health services is poorly understood. This is the first study to examine mental health service use among Latina college students. Using data from a large multi-site study, we found that nearly half of the sample reported experiencing psychological and/or substance use problems, yet only 1 in 4 had received past-year mental health services. Perceptions of need, services, and support were the most influencing factors on service use. Culturally appropriate mental health literacy programs may help address the unmet need for services.

Mental health issues have been a recognized problem on college campuses for decades, particularly because they can interfere with academic persistence and success (Eisenberg, et al., 2009; R. Kessler, et al., 1995; Storrie, Ahern, & Tuckett, 2010). Research on supported education for students with mental health issues suggests that when appropriate

and timely mental health services are received these students with mental health issues are more likely to persist and succeed in college (Mowbray, et al., 1999; Wagner, 1995). However, a majority of college students experiencing psychological symptoms do not seek and/or receive mental health treatment (Blanco, et al., 2008; Eisenberg, Golberstein, et al., 2007).

Similar to findings from general population research (M Alegria, et al., 2002; W. Vega, Kolody, & Aguilar-Gaxiola, 2001), college students who are least likely to receive professional services for mental health problems are racial/ethnic minorities, particularly Latina/os (Kearney, Draper, & Baron, 2005). Several studies have examined mental health service use among the overall Latina/o college student population (Del Pilar, 2009; Kearney, et al., 2005; Miville & Constantine, 2006; Sullivan, Ramos-Sanchez, & McIver, 2007; Tiago, Janine, & Farber, 2005). Factors associated with mental health service use among Latina/o college students included problem severity, acculturation, and perceived social support (Miville & Constantine, 2006; Sullivan, et al., 2007). However, only study examined potential gender differences in use of campus counseling services among racial/ethnic minorities. Sullivan and colleagues (2007) examined the extant to which problem severity, gender and generational status influenced use of campus counseling services among Asian, Latina/o, and White college students. They found that although Asian and White females were more likely to use services, Latinas were not. Given that they found no racial/ethnic differences in problem severity, this suggests that Latinas were the most at-risk group of underutilization of services relative to need. However, they did not further explore why Latinas with mental health problems were not using services.

Several studies have examined mental health service utilization among community-based samples of Latinas. These studies suggest that Latinas have negative attitudes about sharing problems outside the family (Alvidrez, 1999) and those with more severe symptoms and who are more acculturated (Cachelin, Striegel-Moore, & Regan, 2006) are more likely to seek mental health services. Although these studies reveal important information about mental health service utilization among Latinas, there are likely differences between Latinas from the community and those attending college in factors that may influence patterns and correlates of service use (e.g., perceptions of illness, access to care, education level). To the authors knowledge no studies have specifically examined mental health service utilization among Latina college students, a particularly at-risk group.

College can be a difficult time for many students (e.g, moving away from home, balancing academics and social activities, being fully responsible for oneself). However, evidence suggests that Latina/o college students experience greater stress and distress in the college campus context than their White counterparts (Quintana, Vogel, & Ybarra, 1991), and this is particularly true of Latina students (Cardoza, 1991; Gloria, Castellanos, & Orozco, 2005; Rodriguez, et al., 2000). This reported distress is most often related to the additional environmental, academic, financial, and familial stessors that Latina college students are very likely to experience in the college campus context.

Latina college students often find themselves in an incongruent cultural context given that most postsecondary institutions are predominately White and dominated by Western cultural norms (Jones, Castellanos, & Cole, 2002). This type of environment had been reported to decrease the sense of belonging among Latina college students (Hurtado

& Carter, 1997), which can have negative consequences for their mental health, well-being, and ultimately increase college drop-out risk (Gloria, Castellanos, Lopez, & Rosales, 2005).

Latina college students also face similar difficulties in their family context. Family is the most central component to the Latina/o culture and there is an expectation that the needs of the family will be put before all else, even the self (Marin & Marin, 1991). This cultural tradition, known as familismo, is particularly important for Latinas who are often the primary caretakers of the family. Although family can be a great source of support for Latina college students (Gloria & Rodriguez, 2000), it can also cause significant stress. Many Latina college students report that they feel pressured to maintain their familial responsibilities while pursuing their education and feel guilty if they don't because they are not upholding their cultural values (Sy & Romero, 2008). Family related can also interfere with academic success among Latina college students. In fact, family issues are one of the key factors in academic nonpersistence among Latina college students (Gloria, Castellanos, Lopez, et al., 2005).

Financial difficulties have also been identified as a major source of distress for Latina college students (Hernandez, 2000; Quintana, et al., 1991). Many Latina/o college students come from a low socioeconomic background (Kelly, et al., 2010) and there is evidence that they are more likely than their non-Latina/o counterparts to work while in college, work longer hours, and to drop out of school due to financial issues (Longerbeam, Sedlacek, & Alatorre, 2004). Although finances are an issue for both Latina and Latino college students, Latinas report more distress regarding this issue than

Latinos (Munoz, 1986), which not only impacts their well-being but also their ability to persist and succeed in their pursuit for higher education.

In light of these difficulties it is not surprising that Latina college students present with more distress and higher rates of depression and anxiety than Latino college students and their White and Black counterparts (Contreras, et al., 2004; Gore & Aseltine Jr, 2003; Saldana, 1995). However, given the negative consequences of untreated mental illness, particularly on academic success, it is essential to improve our understanding of mental health service utilization among Latina college students, an at-risk and understudied population. Investing more efforts to ensure that Latina college students with emotional/mental health problems are getting appropriate and timely help may not only increase their well-being, but also the likelihood they will succeed in school and in life. However, in order to address the mental health issues Latina college students face we need to have a better understanding of their needs.

To help address these gaps in the literature, this study examined patterns and correlates of mental health service utilization among Latina college students. This is the first study to explore this topic specifically among Latina college students, and to do so with a large national sample. This provides a strong foundation of knowledge for developing targeted interventions for this at-risk population. Furthermore, examining mental health service utilization in the college campus context, where services are often free or low fee and readily available, affords the opportunity to explore what service use might look like if access was not an issue and thus has potential policy implications.

Health services research has long been criticized for the absence of theory (e.g., Brazil et al., 2005). Given that we were interested in exploring how a comprehensive set

of factors influence mental health service use among Latina college students we decided to use Andersen's Behavioral Service Use Model (BSUM) (Andersen, 1973) as a conceptual framework to guide our selection of key factors. The BSUM has been used to study many other at-risk populations and suggests that there are many factors, individual as well as sociocultural, that influence service use including enabling (e.g., family resources, income, insurance coverage, community resources), needs (e.g., individual and clinician perceptions of illness severity), and predisposing (e.g., age, ethnicity, education, family composition, social structure, health beliefs) factors. For our study we examined the influence of the 3 categories of factors on mental health service use among Latina college students, but used the terms, access, needs, and attitudes/beliefs.

Methods

This study used data from the Healthy Minds Study (HMS), a 4-year web-based survey study of college student mental health and mental health service use behaviors (Eisenberg, Golberstein, et al., 2007). The HMS includes data from a racially and ethnically diverse sample of over 36,000 undergraduate and graduate students 18 years of age and older who, at the time of data collection, were enrolled in one of 54 different colleges and universities across the nation. Given that the HMS was advertised widely and any institution could participate as long as they contributed to study costs, both private and public schools were included.

Data collection procedures

Data collection took place in 2007, 2009, and 2010. In 2007 and 2009, 1,000 students were randomly selected and in 2010, 4,000 students were randomly selected from each institution that volunteered to participate. Selected students were sent an

invitation to participate that included a detailed introduction to the HMS, information regarding confidentiality and consent, and a link to the on-line survey. Informed consent was obtained from all participants before beginning the survey. The survey took approximately 20 minutes to complete. Less than half of the recruited students participated in the study. The study was approved by the IRBs of all participating schools.

Current sample & measures

All three waves of the HMS were aggregated for this study. Given the focus of this study was to examine mental health service utilization behaviors among Latina college students, only females who self-identified as "Hispanic/Latino" were included. There were a total of 2,087 Latina college students in the HMS, however due to missing data, only 1,876 were included in the following analysis. On average Latina college students were 21 years of age, 94% were American citizens, 82% were earning their bachelors degree, and the majority came from a mid-level socioeconomic background. There were no differences between those in the full sample and those in the analysis on any of these key demographic variables.

Measures

Mental health service utilization, the primary outcome for this study, was assessed with two items, *any past year use* of mental health services and *frequency of past year use*. Participants were asked, "In the PAST 12 MONTHS have you received counseling or therapy for your mental or emotional health from a health professional (such as psychiatrist, psychologist, social worker, or primary care doctor)?" ('Yes/No').

Participants who answered in the affirmative were asked about the total number of visits or sessions, with categorical response options (1-3, 4-6, 7-9, 10 or more).

The independent variables were categorized based on their membership to the 3 main factors: access, needs, and attitudes/beliefs, which are described below.

Access was assessed with 4 items, insurance coverage, socioeconomic background, citizenship status, and knowledge of services. Participants were asked to indicate whether they were insured ('yes/no') and if so, the source of their current health insurance (e.g., parents, employer, student health coverage, out-of-pocket, or government assistance). We were only interested in whether students were insured or not and thus excluded type of insurance information from analysis. Childhood financial status was assessed to determine socioeconomic background. Participants were asked to describe their family's financial situation growing up (1 = very poor, not enough to get by, 5 = well to do). Participants were asked whether or not they were a U.S. citizen or permanent resident. Participants were also asked if they knew where to go for professional help if they were experiencing mental or emotional problems (1 = strongly agree, 5 = strongly disagree).

Needs were assessed with eight items, four that measured psychological symptomatology (e.g., depression, anxiety, anorexia, suicidal ideation), three that measured substance use (e.g., cigarette use, binge drinking, other drug use), and one that assessed for perceived need for professional help. Depression and anxiety were assessed separately with the Patient Health Questionnaire (PHQ) (Kroenke, et al., 2001). Anorexia was assessed with questions from the Structured Clinical Interview for DSM Disorders (SCID; (First, Spitzer, Gibbon, & Williams, 1996), which is a commonly used

assessment tool in eating disorder research (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004). Suicidal ideation was assessed with one question that asked participants if they had seriously thought about attempting suicide in the past year ('yes/no').

All substance use items were measured with a single question. Frequency of cigarette use in past-30 days was assessed and recoded to reflect no use, low use (0 = < 1 per day) and regular/high use (1 = 1 or more per day). Frequency of binge drinking (having 4 drinks in a row) in the past 2-weeks was assessed and recoded to reflect none (0), low (1 = 1-2 times), and regular/high (2 = 3 or more times). Participants were also asked if they had used any other drugs (e.g., marijuana, cocaine, heroin, methamphetamines, stimulants, ecstasy, other prescription meds without a prescription) in the past 30 days ('yes/no').

Perceived need for professional help was assessed with a single item based on whether they thought they needed help for emotional or mental health problems ('yes/no').

Attitudes/beliefs were assessed with 6 items, 3 that measured attitudes/beliefs directly related to mental health service use (i.e., helpfulness, stigma) and 3 that measured sociocultural attitudes/beliefs that have been found to be relate to service use (i.e., religiosity, perceived discrimination, family support).

Participants were asked how helpful they felt services ("therapy or counseling") were for their peers who are struggling with depression (1 = very helpful, 4 = not at all helpful). Participants' stigma towards mental health service use was also measured with an adapted version of the Discrimination-Devaluation Scale (DDS) (Link, 1987; Link, Cullen, Struening, Shrout, & Dohrenwend, 1989). Both, *perceived* and *personal* stigma was assessed with 3 items each. Participants rated the degree to which they agreed that

that others had negative attitudes/beliefs about service use (e.g "most people think that receiving mental health treatment is a sign of personal failure") and that they had negative attitudes/beliefs about service use (e.g., "I think that receiving mental health treatment is a sign of personal failure") (1 = strongly agree, 6 = strongly disagree).

Religiosity, perceived discrimination, and perceived family support were also included in the study. Religiosity was assessed with a single item based on how religious they felt (1 = very religious, 4 = not religious at all). Perceived discrimination was measured based on the frequency of feeling they were treated unfairly because of their race, ethnicity, or cultural background (1 = never, 6 = almost all of the time). Participants also indicated the degree to which they felt that they got the support they needed from their family (1 = strongly disagree, 5 = strongly agree).

Analytic strategy

Bivariate tests among the study variables were first conducted to examine general patterns and correlates of service utilization. Variables that were statistically significant at the bivariate level were retained for multivariate analysis. Multivariate logistic and multinomial regression analyses were then conducted to adjust for confounding variables in the examination of past-year and frequency of service use. Subsequent multivariate analyses were also conducted to determine the amount of variance in any past year use of services that was explained by each category of factors: access, needs, and attitudes/beliefs. All subset of variables were included in this set of analyses, regardless of their significance at the bivariate level.

All analyses were conducted using Stata (StataCorp, 2009). Response propensity weights were included to account for survey non-response (Eisenberg, Gollust,

Golberstein, & Hefner, 2007). A robust sandwich estimator was used to make adjustments for clustering and non-independence of observations given the hierarchical structure of the data (i.e., students nested within institutions).

Results

Psychological symptoms, substance use, and service use

Psychological and substance use problems as well as mental health service use are presented in Table 1. Nearly half of Latina college students in the HMS presented with at least one psychological or substance use problem. However, only 23% reported that they had used counseling/therapy in the past year for their mental or emotional problems. Of those who did use services in the past year, it was most common that they only had 1 to 3 sessions (40%).

Bivariate analyses

Table 2 presents the odds ratios (OR) and relative risk rations (RRR) for past-year and frequency of service use, respectively. Latina college students who were insured, knew where to go to get professional help, had psychological and substance use problems (e.g., depression, anxiety, suicidal ideation, illicit drug use), had positive attitudes/beliefs about mental health services (e.g., would be helpful, not personally stigmatizing), and were higher in religiosity were more likely to have used counseling/therapy in the past year than those who did not report these factors.

Among Latina college students who had used counseling/therapy, those with psychological symptoms (e.g., symptoms of anorexia, suicidal ideation), who thought that services were helpful (RRR = 1.50, 95% CI = 1.01-2.21), who had experienced more discrimination (RRR = 1.34, 95% CI = 1.03-1.76) and those who felt less supported by

their family (RRR = 0.73, 95% CI = 0.60-0.89) were more likely to have had 10 or more sessions in the past year than 1 to 3 sessions. Personal stigma was also related to frequency of past year use, however Latina college students who held more personally stigmatizing attitudes/beliefs about services were actually *more* likely to have used services more frequently in the past year than those who held less personally stigmatizing attitudes/beliefs (RRR = 2.58, 95% CI = 1.58-4.21).

However, the likelihood of having had counseling/therapy in the past year and having had more than 1 to 3 sessions were highest among those who perceived a need for professional help. Specifically, those who perceived a need for services were approximately 10 times more likely to have had counseling/therapy (OR = 9.76, 95% CI = 6.92-13.76) and almost 7 times more likely to have had 10 or more sessions than 1 to 3 sessions (RRR = 6.78 95% CI = 1.74-26.40) in the past year than those who did not perceive a need.

Multivariate analyses

Table 3 displays the adjusted odds ratios (AOR) and adjusted relative risk ratios (ARRR) for past-year and frequency of service use, respectively. A high degree of stability in the estimates was observed in comparison to the bivariate estimates for most factors. However, when all significant factors were examined simultaneously (being insured, knowledge of services, depression, anxiety, suicidal ideation, drug use, perceived need, helpfulness of treatment personal stigma, and religiosity), psychological symptoms and substance use were no longer related to past-year use of services. Perceived need was the only needs factor that remained significantly related to past-year use. Latina college students who perceived a need for professional help were still almost 10 times more

likely to have had counseling/therapy in the past year than those who did not perceive a need (AOR = 9.47, 95% CI = 6.92-13.76).

Multivariate analyses of frequency of past year use of counseling/therapy revealed similar results in that there was relatively little change from the bivariate analyses. As shown in Table 3, Latina college students with psychological problems (e.g., symptoms of anorexia, suicidal ideation) were 4 times more likely to have had 10 or more counseling/therapy sessions in the past year than those who did not report these problems. Those who thought mental health treatment was helpful (ARRR = 1.86, 95% CI = 1.09-3.16), who held more personally stigmatizing attitudes/beliefs about services (ARRR = 2.48, 95% CI = 1.34-4.59), and felt that their family was less supportive (ARRR = 2.48, 95% CI = 1.34-4.59) were still more likely to have had more than 1 to 3 counseling/therapy sessions in the past year. However, again those who perceived a need for services that were most likely to have had more than 1 to 3 counseling/therapy sessions in the past year. Specifically, Latina college students who perceived a need for services were approximately 11 times more likely than those who did not perceive a need to have had 10 or more sessions of counseling/therapy in the past year than 1 to 3 sessions (ARRR = 10.62, 95% CI = 1.38-81.55).

Additional multivariate analyses were conducted to determine how the amount of variance in any past year use of counseling/therapy accounted for by each category of factors: access, needs, and attitudes/beliefs. Table 4 shows the adjusted odds ratios (AOR), 95% confidence intervals (CI), and explained variance (Pseudo R^2) for each category of factors.

The needs model accounted for 20% of the variance in any past year use of counseling/therapy among Latina college students, which was far more than the attitudes/beliefs and access models and almost exactly the same as the full multivariate model (21%; see Table 3). The access model accounted for the least amount of variance in past service use, less that 5%.

Discussion

This is the first study to examine mental health service utilization among Latina college students, a population that has been evidenced to experience great distress and mental health problems in the college campus context. Not only does this study fill an apparent gap in the literature, but due to large sample of students from across the nation and the inclusion of a comprehensive set of factors the findings from this study can be integral in developing and/or innovating interventions to address the mental health needs of Latina college students.

Our study shows that a significant number of Latina college students are struggling with psychological and substance use problems. However, less than 1 in 4 of students with these problems received mental health services in the past year. Among those who did receive services, the majority only had 1 to 3 professional contacts, which raises serious questions regarding the adequacy of treatment for this at-risk population.

We found a number of factors that influenced Latina college students' past year and frequency of mental health service use. Most notably was the relatively small impact of access to services. Access factors (e.g., insurance coverage, socioeconomic status, education, nativity) have been identified as most influential in mental health service use among Latina/os (M Alegria, Mulvaney-Day, Woo, et al., 2007). In our study, access

factors were the least influential compared to needs and attitudes/beliefs factors. This may be due to the fact that most college campuses offer free or low fee mental health services right on campus, making access to services less salient. Although having insurance increased the likelihood that Latina college students had received services in the past year this may relate more to service familiarity as rather than finances given that the only other access factor that was related to service use was having knowledge about where to get services.

Another important finding was the influence of religiosity on mental health service use among Latina college students. Research and theory suggest that racial/ethnic minorities are less likely to use professional services because they prefer to turn to their religious community (Leong, Wagner, & Tata, 1995). We found that among Latina college students, those who were more religious were more likely to have used professional services in the past year. It is possible that Latina college students who are more religious have faith that things can and will improve and thus are more motivated to seek opportunities that may assist in making things better. It is also possible that they first sought help from their religious community, and were advised to seek more professional help. In any case it appears that religiosity, for Latina college students, is a protective factor and this information can be useful for future research and interventions that target this population.

Lastly, our findings suggest that perceptions play an integral role in mental health service use among Latinas. Decades of research suggests that perceptions of illness and of services (e.g., stigma) are a key factors in service use (Katz, et al., 1997; Mojtabai, Olfson, & Mechanic, 2002; Richman, Kohn-Wood, & Williams, 2007). Consistent with

the literature, we found that perceptions of need, of the helpfulness of treatment, of family support, and of treatment related stigma were influential in mental health service use among Latina college students and even more so than reported psychological distress (e.g., depression, anxiety) and substance use. This may be due to the normalization of depressive and anxious symptoms, and binge drinking on college campuses (O'Malley & Johnston, 2002). It may also be that Latinas have different cultural beliefs about what constitutes a psychological or substance use problem that warrants help and where one should go for that help. Future research that explores these perceptions in more depth is needed.

Limitations

Despite the many strengths of this study, it is important to consider the results in the context of the study limitations. Our study provided detailed information about mental health service use among Latina college students given that it included assessment of both past year and frequency of past year use. However, there was no assessment of mental health service use beyond the past year. Latina college students may have had earlier service use experiences that influenced their past year use, but we cannot determine that with our study. Future studies may benefit from asking about lifetime mental health service use or using a prospective longitudinal study design that allows for the assessment of mental health service use overtime.

Another limitation of this study was that there was no assessment of subtype of Latina/o identity or acculturation. There is evidence that there are differences in mental health service utilization between the various Latina/o subgroups (M Alegria, Mulvaney-Day, Torres, et al., 2007) and those of varying acculturation levels (W. Vega, et al.,

2001), even among Latina/o college students (Miville & Constantine, 2006). Although our study was unique in the inclusion of such a large sample of Latina college students from across the nation we acknowledge that Latinas are not a homogenous group. There are many different subtypes as well as varying levels of acculturation among Latina/os. In order to gain a deeper understanding of how identity may influence mental health service use among Latina college students, future studies need to include assessments of Latina/o subtype and acculturation level.

Implications

Our results confirm that Latina college students are an at-risk population experiencing mental health and substance use problems and not receiving mental health treatment relative to their needs. Although it is discouraging that Latina college students are struggling and not getting the help that they need, findings from this study have implications for developing interventions to address the unmet need for mental health services specifically among Latina college students, but also for the larger college campus context and possibly even for the general population.

The unmet need for mental health treatment among Latina college students seemed to largely be a function of their perceptions of illness and their knowledge and beliefs about mental health services. These findings suggest that one way to intervene would be to increase mental health literacy among Latinas. Requiring that all students, faculty, and staff take an online mental health literacy course when first entering the college campus context may be a low cost yet efficient way to address the issue of unmet need for mental health services.

This study provided insight into the mental health needs of Latina college students, particularly regarding mental health service use. However, this is only the first study to examine this topic, highlighting many areas that need further exploration. In particular, our study highlights that future studies need to explore Latina college students' perceptions of psychological problems and service use in greater detail. One way to enhance our understanding of these issues is to use qualitative methods that are designed to uncover individuals perceptions and the meaning they make of the world around them (Patton, 2002).

With Obama's national agenda to close the college completion gap it is likely that we will continue to see an increase in college enrollment among Latina youth (Kelly, et al., 2010). However, if we do not address the difficulties Latinas face in the college campus context we are not likely to meet Obama's goals and more importantly Latinas may not have the opportunities that well-being and an education brings to having a healthy and successful life.

Table 4.1. *Sociodemographics, mental health status, and service use thoughts and behaviors of Latina college students (N=1,876)*

Variables	% (Mean/SD)	Variables	% (Mean/SD)
Age		**Perceived need for professional services (yes)**	48
18-22 years	66	**Psychological symptoms**	
23-30 years	24	Depression	22
31+ years	9	Anxiety	13
Degree program		Anorexia	4
Undergraduate	82	Binge eating	21
Graduate	18	Suicidal Ideation	7
Childhood financial status[a]	(3.42/0.89)	**Substance Use**	
U.S. citizen	94	Cigarette use (1+/day in past 30 days)	5
Institution type		Binge drinking (4+ drinks in 1 sitting in past weeks)	12
Hispanic & emerging Hispanic serving institutions	52	Other drug use (past 30 days)	17
Insurance coverage (yes)	83	**Attitudes/beliefs**	
Parent plan	46	Counseling/therapy is helpful[b]	(3.15/0.79)
Employer's plan	10	Perceptions of stigma[c]	(3.89/1.01)
Student plan	19	Personal stigma[c]	(3.51/0.48)
Other	14	Religiosity[b]	(2.56/0.90)
Knowledge of where to get professional help (yes)	65	Perceived discrimination[d]	(1.62/0.84)
Any past year use of counseling/therapy (yes)	18	Perceived family support[e]	(3.85/1.32)
Frequency of past year use of counseling/therapy			
1-3 times	40		
4-6 times	22		
7-9 times	16		
10+ times	22		

Note: SD = standard deviation. Information about the range for variables were indicated with superscript: a. 1 (*very poor*) to 5 (*well to do*); b.1 (*very*) to 4 (*not at all*), c. 1 (*high*) to 6 (*low*), d. 1 (*never*) to 6 (*all the time*), e. 1 (*strongly disagree*) to 5 (*strongly agree*).

Table 4.2. *Bivariate logistic regression analysis of any past year use and multinomial logistic regression analysis for frequency of past year use of counseling/therapy for mental and/or emotional problems among Latina college students.*

	Any past year use of counseling/therapy (N=1,876) OR (CI 95%)	**Frequency of past year use of counseling/therapy (N=331) (1-3 times as reference)**		
		4-6 times RRR (CI 95%)	**7-9 times RRR (CI 95%)**	**10+ times RRR (CI 95%)**
Access				
Insurance coverage	**1.51 (1.11-2.06)**	0.78 (0.40-1.55)	0.55 (0.18-1.70)	1.04 (0.39-2.73)
Childhood financial status	1.10 (0.96-1.26)	0.95 (0.71-1.28)	0.98 (0.72-1.33)	0.86 (0.58-1.28)
Nativity	0.77 (0.40-1.48)	0.82 (0.34-2.00)	1.92 (0.42-8.78)	0.82 (0.38-1.79)
Knowledge of services	**3.04 (2.27-4.08)**	1.38 (0.61-3.12)	1.36 (0.62-2.96)	1.71 (0.83-3.55)
Needs				
Symptomatic need				
Depression	**1.73 (1.25-2.40)**	1.03 (0.57-1.88)	1.26 (0.84-3.08)	1.61 (0.84-3.08)
Anxiety	**1.95 (1.43-2.64)**	0.96 (0.40-2.32)	0.70 (0.30-1.65)	1.42 (0.66-3.08)
Anorexia	1.16 (0.92-1.48)	1.28 (0.74-2.21)	2.02 (0.93-4.39)	**2.36 (1.23-4.52)**
Suicidal Ideation	**1.91 (1.19-3.08)**	0.98 (0.34-2.80)	2.18 (0.93-5.10)	**3.06 (1.32-7.13)**
Drug use	**1.81 (1.35-2.43)**	0.91 (0.44-1.87)	0.92 (0.49-1.73)	1.22 (0.73-2.04)
Cigarette use	1.19 (0.72-1.97)	1.53 (0.47-4.98)	1.23 (0.30-5.03)	2.56 (0.93-7.06)
Binge drinking	1.11 (0.93-1.31)	1.14 (0.74-1.75)	1.00 (0.69-1.46)	0.83 (0.55-1.26)
Perceived need	**9.76 (6.92-13.76)**	1.36 (0.48-3.81)	1.87 (0.58-6.01)	**6.78 (1.74-26.40)**
Attitudes/beliefs				
Helpfulness of treatment	**1.27 (1.09-1.47)**	1.09 (0.74-1.61)	1.25 (0.88-1.78)	**1.50 (1.01-2.21)**
Perceived stigma	0.96 (0.84-1.10)	1.28 (0.94-1.75)	0.83 (0.61-1.14)	0.97 (0.77-1.22)
Personal stigma	**0.66 (0.49-0.88)**	**2.58 (1.58-4.21)**	1.32 (0.65-2.69)	1.64 (0.83-3.28)
Religiosity	**1.52 (1.25-1.84)**	0.91 (0.64-1.31)	1.04 (0.76-1.43)	1.24 (0.89-1.74)
Perceived discrimination	0.97 (0.80-1.18)	0.81 (0.57-1.16)	1.06 (0.71-1.58)	**1.34 (1.03-1.76)**
Perceived family support	0.98 (0.89-1.07)	0.92 (0.73-1.17)	0.89 (0.72-1.10)	**0.73 (0.60-0.89)**

Note: OR = adjusted odds ratio. RRR = adjusted relative risk. CI = confidence interval. All models were adjusted for clustering around the different institutions included in the study. All bolded values are statistically significant based on a confidence interval that does not include the value 1.0.

Table 4.3. *Multivariate logistic regression analysis of any past year use and multivariate multinomial logistic regression analysis of frequency of past year use of counseling/therapy for mental and/or emotional problems among Latina college student (w/a robust estimator).*

	Any past year use of counseling/therapy (N=1,876)	**Frequency of past year use of counseling/therapy (N=331) (1-3 times as reference)**		
	AOR (CI 95%)	**4-6 times ARRR (CI 95%)**	**7-9 times ARRR (CI 95%)**	**10+ times ARRR (CI 95%)**
Access factors				
Insurance coverage	**1.50 (1.06-2.11)**	0.92 (0.38-2.20)	0.86 (0.27-2.67)	1.48 (0.60-3.62)
Childhood financial status	1.12 (0.95-1.31)	0.91 (0.59-1.42)	1.10 (0.77-1.56)	0.93 (0.62-1.41)
Nativity	1.25 (0.65-2.43)	1.02 (0.34-3.04)	0.82 (0.16-4.36)	0.87 (0.22-3.41)
Knowledge of services	**3.05 (2.16-4.29)**	1.38 (0.65-2.96)	1.17 (0.53-2.62)	2.92 (0.92-9.26)
Needs factors				
Symptomatic need				
Depression	1.21 (0.75-1.95)			
Anxiety	1.06 (0.78-1.45)			
Anorexia		1.71 (0.75-3.87)	**4.24 (1.72-10.43)**	**3.97 (1.96-8.07)**
Suicidal Ideation	1.13 (0.64-2.01)	0.93 (0.27-3.28)	2.61 (0.95-7.18)	**3.63 (1.20-11.02)**
Drug use	1.14 (0.80-1.62)			
Cigarette use				
Binge drinking				
Perceived need	**9.47 (6.79-13.21)**	1.96 (0.66-5.79)	2.13 (0.61-7.48)	**8.38 (1.08-65.28)**
Attitudes/beliefs				
Helpfulness of treatment	**1.25 (1.04-1.50)**	1.17 (0.66-2.07)	**1.87 (1.18-2.95)**	**2.05 (1.20-3.50)**
Perceived stigma				
Personal stigma	0.72 (0.50-1.02)	**2.50 (1.34-4.68)**	2.10 (0.82-5.39)	0.86 (0.41-1.81)
Religiosity	**1.32 (1.07-1.64)**			
Perceived discrimination		0.59 (0.33-1.08)	0.81 (0.58-1.12)	1.10 (0.83-1.46)
Perceived family support		0.96 (0.71-1.29)	0.94 (0.72-1.23)	**0.73 (0.56-0.95)**
Pseudo R^2	0.21		0.10	

Note: AOR = adjusted odds ratio. ARRR = adjusted relative risk. CI = confidence interval. Psuedo R^2 = value that indicates the variability in the dependent variable explained by the presenting model. McFadden's R^2 is reported here. All models were adjusted for clustering around the different institutions included in the study. All bolded values are statistically significant based on a confidence interval that does not include the value 1.0.

Table 4.4. *Multivariate logistic regression analysis of any past year use of counseling/therapy among Latina college students: Examining the fit of the access, needs, and attitudes/beliefs models.*

	Any past year use of counseling/therapy (N=1,876)		
	Access model AOR (CI 95%)	**Needs model AOR (CI 95%)**	**Attitudes/beliefs model AOR (CI 95%)**
Access			
Insurance coverage	**1.37 (1.01-1.86)**		
Childhood financial status	1.04 (0.91-1.19)		
Nativity	0.82 (0.41-1.62)		
Knowledge of services	**2.97 (2.21-4.00)**		
Needs			
Symptomatic need			
Depression		1.16 (0.74-1.82)	
Anxiety		1.05 (0.77-1.44)	
Anorexia		0.98 (0.73-1.30)	
Suicidal Ideation		1.16 (0.66-2.06)	
Drug use		1.47 (0.99-2.20)	
Cigarette use		0.85 (0.49-1.45)	
Binge drinking		0.85 (0.69-1.03)	
Perceived need		**10.17 (7.20-14.35)**	
Attitudes/beliefs			
Helpfulness of treatment			**1.27 (1.09-1.48)**
Perceived stigma			0.92 (0.80-1.05)
Personal stigma			**0.72 (0.53-0.98)**
Religiosity			**1.45 (1.19-1.76)**
Perceived discrimination			0.96 (0.82-1.13)
Perceived family support			0.94 (0.86-1.04)
Pseudo R^2	0.04	0.20	0.07

Note: AOR = odds ratio. ARRR = relative risk. CI = confidence interval. Psuedo R^2 = value that represents the amount of variability in the dependent variable accounted for by the presenting model or the goodness-of-fit. McFadden's R^2 is reported here. All models were adjusted for clustering around the different institutions included in the study. All bolded values are statistically significant based on a confidence interval that does not include the value 1.

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Chapter 5

General discussion

Many Latina college students like Isabella are not only at-risk of mental health and substance use problems, but also of not completing their college education. Given that mental health and substance use problems interfere with academic performance and persistence (Eisenberg, Golberstein, & Hunt, 2009; Kessler, Foster, Saunders, & Stang, 1995), addressing these problems among Latina college students may be a way to help close the college completion gap among this population. Although the difficulties that Latina college students are facing should be a major concern of institutional administration and education policymakers, it should also be on the radar of social workers and psychologists. First, social workers and psychologists are likely the professional that will be called to work directly with Latina college students to help them overcome their mental health problems. Second, the mission of social work and psychology is to improve the lives of humans, particularly of those in need (American Psychological Association, 2011; National Association of Social Workers, 2011) and Latina college students certainly are in need. However, in order to effectively intervene and to reduce the likelihood of mental health problems among Latina college students and ensure that obtain their college degree, we have to get a better understanding of the specific problems they face. We need to know what influences the mental health

problems they experience, how we can best detect such problems, and when these problems exist, how do we ensure that Latina college students are getting the help that they need? This three study dissertation was designed to answer these questions.

Gaining a better understanding of the mental health needs of Latina college students will serve to increase knowledge and awareness and better prepare those who work with such populations. However, the information gleaned from this dissertation may not only inform practice with Latina college students and similar at-risk populations, it may also have implications for training, policy, and future research in this domain.

Study I: Prevalence, comorbidity, risk and protective factors

Study one revealed that although Latina college students are experiencing many mental health and substance use problems, they are most at risk for depression. In fact, consistent with the literature (Contreras, Fernandez, Malcarne, Ingram, & Vaccarino, 2004; Everett, et al., 1999; Grucza, Norberg, & Bierut, 2009) Latina college students were more likely to experience depression and less likely to use substances than their non-Hispanic White counterparts. Not only were Latinas less likely than White females to use substances, comorbidity between substance use and mental health problems among Latinas was almost non-existent. However, it is important to note that although rates of binge drinking were lower among Latinas, this behavior was still prevalent with nearly 40% of Latinas reporting binge drinking.

Several risk and protective factors were associated with mental health and substance use problems among Latina and White female college students. However, not all factors influenced mental health and substance use problems among Latinas as they did among White females. In fact, institutional dissatisfaction was the only risk factor

that did not differentially influence mental health and substance use problems among these groups. Those who were dissatisfied with their institution were more likely to experience depression and anxiety, but this factor was unrelated to substance use.

Religiosity also influenced substance use and anxiety in the same way across groups. Being religious was a protective factor for anxiety and substance use among Latinas and White females. However, where religiosity was a protective factor for depression among White females, it was unrelated to depression among Latinas. This difference may be due to differences in religious beliefs. Many Latina/os believe in fatalism, the idea that things are fixed and cannot be changed (Cuellar, Arnold, & Gonzalez, 1995). This set of beliefs may bring comfort in the sense that one does not have to worry about the future because it is predetermined. This may explain why religiosity was a protective factor for anxiety. However, this belief system may also be depressing because an individual may feel powerless or stuck, especially if they are in a bad situation. However, only a single item was used to assess for religiosity. To gain a better understanding of the relationship between religiosity and mental health, future research should include a more in depth assessment of religiosity (e.g., denomination, church attendance, prayer practice, spirituality vs. religious).

Social support was also a protective factor for depression and anxiety among Latinas and White females. However, social support as well as discrimination differentially influenced substance use among Latinas and Whites. Among Latinas, social support and discrimination was unrelated to substance use. Among White females, social support was a protective factor and discrimination was a risk factor for drug use. These finding coupled with the high comorbidity of substance use and mental health problems

among White females suggests that there may be differences between these two groups in motives for substance use. According to the self-medication hypothesis individuals often use substances as a means to cope with negative affect (Khantzian, 1997). This appears to be true among White females, but not Latinas. It is less socially acceptable for females within the Latina/o culture to use substances, which may explain why Latinas have lower rates of substance use and comorbidity. However, it is also plausible that Latinas are using substances but because of the social stigma they are more reluctant to report use and thus there is a self-report bias. Further research is needed to determine the motives of substance use among Latinas and if there is a self-report bias among this population.

Frequent experiences of discrimination also differentially influenced anxiety among Latinas and White females. White females who experienced frequent discrimination were more likely to experience anxiety whereas discrimination was unrelated to anxiety among Latinas. This difference may be because Latinas were more accustomed to being discriminated against given that they report significantly higher rates of discrimination. Although it may make them sad (or depressed), Latinas may not have anxiety related to discrimination because they come to expect it. Whereas for White females, being discriminated against may be a novel experience and thus more emotionally distressing.

Although Latina and White female college students are both experiencing mental health and substance use problems, they are experiencing them at different rates and there are differences in risk and protective factors for these problems. These results suggest that it may be important to target certain groups for certain interventions (e.g., Latinas for depression, White females for substance use). However, there were also similarities

between Latinas and White female students in risk and protective factors. Thus, it may be useful to take the common factors approach where programs are developed based on the similarities between groups and within the same program differences are acknowledged and addressed. This may not only help to meet the needs of both groups, but it may also help students from different backgrounds to see their similarities and differences, which could become a great social support network for struggling students.

Study II: Use of the PHQ-9 with Latinas

In addition to finding that the PHQ-9 was an unbiased construct and thus an appropriate measure to use to assess for depression among Latina and White female colleges students, results also suggested that the PHQ-9 may serve to increase accurate detection of depression in these populations. Although the PHQ-9 is most often used as a unidimensional measure of depression, among Latina and White college students the best fitting model of the PHQ-9 was multidimensional. There were two factors, one characterized by affective symptoms and the other by somatic symptoms. Distinguishing between these two sets of symptoms may be particularly important among female college students. Somatic complaints such as being tired, eating poorly, and sleeping irregularly are the norm among this population (Buboltz, Brown, & Soper, 2001; Davy, Benes, & Driskell, 2006) and thus may not be as indicative of depression as affective symptoms. These findings suggest that the PHQ-9 may be an ideal measure to use among female college students, particularly Latinas who are at greater risk of depression. Not only can the PHQ-9 provide a quick provisional diagnosis of depression, but the measure highlights the different symptoms of depression, which may help to improve diagnosis and treatment.

Study III: Rates and associations of mental health service utilization

Study three found that despite the fact that Latina college students were experiencing many mental health (i.e., depression, anxiety, eating disorder symptoms, suicidal ideation) and substance use problems (i.e., drug use, binge drinking), they were not receiving treatment relative to need. In fact, less than a third of those with such problems had used services in the past year.

Many factors were associated with an increased likelihood of mental health service use among Latina college students including having insurance, knowing where to go for services, and thinking that services would be helpful. However, the most influential factor was perceived need for professional services. Those who perceived a need for treatment were almost 10 times more likely to use services than those who did not perceive a need. In fact, perceived need was more strongly associated with mental health service use than symptom severity. When considered independently, depression, anxiety, suicidal ideation and drug use increased the likelihood of service use. However, when mental health and substance use problems were considered simultaneously with perceived need, symptoms were no longer related to service use.

Perceived need was also the most influencing factor in the frequency of use of mental health services. Although those with symptoms of anorexia and suicidal ideation were more likely to use services more frequently (10+ times), those who perceived a need for treatment were 8 times more likely than those who did not have a perceived need to use services more frequently. The only factor that decreased the likelihood of using services more frequently was family support.

These findings suggest that whether or not a Latina college has mental health or substance use problems is less important than whether she perceives that she has such a problem (or problems) and that it warrants professional help. Contrary to findings within the general adult Latina/o population that has found that access is the strongest predictor of mental health service use (M Alegria, Mulvaney-Day, Woo, et al., 2007), among Latina college students access accounted for the least amount of variance in mental health service use. Needs factors, particularly perceived need, accounted for the most variance in mental health service utilization among Latina college students (20%). Access factors such as socioeconomic status, insurance coverage, and transportation may be less salient in the college campus where services are typically free or low fee and right on campus. However, this does not mean access factors are completely irrelevant among this population. Rather, different access factors such as knowledge of services and language use may be important. This sample of Latinas was an English speaking sample, which indicates that not only is language not a barrier, but it is possible that they are more acculturated. Latina/os who are more acculturated have been found to be more likely to use mental health services (M Alegria, Mulvaney-Day, Woo, et al., 2007). Future studies could benefit from including both Spanish and English speaking Latina college students to see if there are differences in rates of mental health services and reasons for use or non-use.

Limitations

The three studies in this dissertation provide new and important information about the mental health needs of Latina college students. However, these findings should be considered within the context of the following limitations.

One of the biggest strengths of this dissertation was that it included a large sample of Latina college students from across the nation. Using this type of dataset typically would allow for greater generalization of results. However, this dataset did not contain information on sub-ethnic identity, thus results should be generalized with caution. The term "Latina/o" is used to characterize a group of individuals who are of Latin descent. However, just like many other racial/ethnic categories, there are many sub-groups within the Latina/o population. According to the U.S. Census there are over 20 different Latina/o subgroups just within the U.S. (U.S. Census, 2004).

Although these subgroups have some similarities (e.g., being of Latin descent, centrality of family), there are also many distinctions (Gutierrez, Fredricksen, & Soifer, 2000), particularly regarding mental health issues (M Alegria, Mulvaney-Day, Torres, et al., 2007; Berdahl & Torres Stone, 2009). For example, Alegria and colleagues (2007) examined differences in mental health service use among Mexicans, Puerto Ricans, and Cubans and found that Mexicans have the lowest rates of use. Berdahl and colleagues (2009) replicated these results and found a differential influence of acculturation on service use between Mexicans, Puerto Ricans, and Cubans. There are also differences in experiences among the different Latina/o subgroups that may influence mental health and substance use problems. Molina and Mahalingham (under review) found that discrimination was related to psychological distress among Mexicans and Puerto Ricans, but not Cubans.

The only subgroup identification information included in the dataset was nativity (i.e., citizenship status). Nativity and language use are often used proxies for acculturation (Thomson & Hoffman-Goetz, 2009). However, only a small percentage of

Latina college students were foreign-born (4%) and the survey was conducted in English, thus all Latinas had to have a high degree of English-speaking skills. These two pieces of data suggest that this sample of Latina college students may be relatively acculturated. Evidence suggests that Latina/os who are more acculturated are more likely to experience mental health and substance use problems (Ortega, Rosenheck, Alegria, & Desai, 2000) and use mental health services (Vega, Kolody, & Aguilar-Gaxiola, 2001). However, the dataset did not include an actual measure of acculturation and knowing whether an individual was born in or outside the U.S. does not necessarily tell us the degree to which they adhere to Western cultural norms or those of their culture of origin.

Future studies would benefit from including an existing acculturation measure and including Spanish-speaking Latina college students. It is likely that Spanish-speaking Latina students would face language barriers in receiving services, particularly in the predominately White college campus context. To ensure that all Latina college students are getting their needs met, not just the one's that speak English and who are more acculturated, we need to explore how different cultural beliefs and language use influence the experience and perception of mental health and substance use problems and service utilization among the various subgroups of the Latina college student population.

There were also limitations in several of the measures included in this dissertation. Religiosity was an important protective factor associated with mental health and substance use problems and service utilization among Latinas. However, the assessment of religiosity only included one item. There was no information regarding denomination, church attendance, prayer practices, or specific beliefs. Thus, it is not clear what component of religiosity serves as a protective factor. It could be going to church

because individuals feel a sense of support from belonging to a church(Krause & Wulff, 2005). It could also be that believing in a high power (e.g., God) allows them to be more resilient during difficulties (Pargament, 2001). Although this dissertation revealed that religiosity was an important factor, future research that includes a better measure of religiosity is need to understand how religiosity serves to protect Latinas (and White females) from experiencing mental health and substance use problems and motivates them to use services when in need.

Similarly, the assessment of discrimination was also limited to a single item. Participants were asked how often they were treated unfairly due to their racial/ethnic or cultural background. Evidence suggests that using single item assessments of discrimination not only do not capture the experience and effects of discrimination but they are less valid than multi-item discrimination measures (Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005). This suggests that caution should be taken when interpreting findings from study one that suggest that discrimination is more of a risk factor for White females than Latinas.

Despite these limitations, the three studies in this dissertation provide important information about the mental health needs of Latina college students. Of particular concern was the fact that Latina college students were experiencing many mental health and substance use problems, but they were not receiving treatment relative to need. This is alarming given the negative consequences of mental health problems on academic performance and persistence. If Latina college students continue to suffer from untreated mental health problems, not only is it likely that the college completion gap will widen among this population, but their quality of life will decrease and opportunities for future

success will be limited. Thus, it is essential that greater efforts be made not only to understand the mental health needs of this at-risk and understudied population, but also to address these needs.

Implications

Findings from the three studies in this dissertation may not only increase awareness of the mental health problems Latina college students are experiencing, but also inform prevention and intervention programs that can help address these problems. Although it would be ideal to have separate prevention and intervention programs for every group of students who are at-risk on college campuses, this is not realistic and may not be necessary. Results from study one revealed that there were some differences between Latina and White female college students in rates of mental health and substance use problems. However, these findings do not suggest that symptoms of mental health problems or substance use behaviors differed between groups. Thus, prevention and intervention programs for mental health and substance use problems may not have to be tailored for each group, but rather outreach may need to be more targeted. For example, Latina college students were more at risk of depression than White females. This does not mean that it is unnecessary to address depression among White females. Rather, it suggests that increased efforts should be made at targeting Latina college students for existing prevention and intervention programs for depression.

Targeting Latina college students for mental health literacy programs may also be beneficial in addressing their mental health needs. Mental health literacy is "knowledge and beliefs about mental disorders which aid their recognition, management or prevention" (Jorm, et al., 1997). Thus, mental health literacy programs are aimed at

increasing knowledge about mental health problems and services so that individuals are able to recognize symptoms, understand what influences symptoms, and know where to go to and how to get appropriate and timely care. Mental health literacy programs have been delivered in school settings and have served to decrease stigma and increase detection and service use for mental health problems (Jorm & Kelly, 2007).

Results from study three of this dissertation suggest that mental health literacy programs may be particularly important to implement with Latina college students. Perceptions of need was the most strongly associated factor with mental health serve use. Those who perceived a need for professional services were significantly more likely to use services and use them more often compared to those who did not perceive a need. Increasing Latina college students' knowledge of symptoms and services may influence their perceptions of symptoms and services such that they can recognize when symptoms warrant professional help and they know where to go to get that help. Given that there are existing mental health literacy programs that have been successful in the school setting, it may not be necessary to create an entirely new program for Latina college students. Rather, it may be more appropriate to implement more mental health literacy programs on college campuses nationwide with great efforts at targeting Latina college students.

Mental health literacy programs may not only be helpful for Latinas, but also for service providers, faculty, and administration. Knowing that Latinas are more at-risk for depression, service providers can be better prepared to screen for depressive symptoms. In fact, study two suggested that the PHQ-9 may be a particularly useful measure to use to assess for depression among Latina college students. Not only is this a common tool

used to assess for depression in clinical settings, but it was also found to be an appropriate tool for White female college students. Again, this suggests that it may not be necessary to create and employ a measure specifically for Latina college students. Rather, increased awareness of which of the existing measures is appropriate to use with Latina college students is needed.

Service providers should also be aware that Latina college students are at-risk of eating disorders. It was once believe that Latinas were "protected" from eating disorders due to cultural ideals of larger curvier female physiques (Chamorro & Flores Ortiz, 2000; Root, 1990; Warren, Gleaves, Cepeda Benito, Fernandez, & Rodriguez Ruiz, 2005). However, recent evidence suggests that not only are Latinas at-risk of eating disorders (Granillo, Jones-Rodriguez, & Carvajal, 2005), in some cases they present with higher rates of eating disorder symptoms than their White counterparts (Robinson, Chang, Haydel, & Killen, 2001). Results from study three of this dissertation show that Latina college students are presenting with eating disorder symptoms and these rates are comparable to their White counterparts. Of particular concern was the high rates of binge eating symptoms among Latinas. Many individuals who present with binge eating symptoms are referred for weight loss treatment without any screening for an eating disorder, and this is particularly true among Latinas (Cachelin, Striegel-Moore, & Regan, 2006). Increased knowledge of the symptoms of eating disorders and that Latinas are at high risk may improve detection and thus referral and treatment.

Faculty and administration may benefit from mental health literacy programs. Knowing that social support serves as a protective factor for mental health and substance use problems among Latinas as well as White females may help faculty in their

interactions with students. Administration may also increase efforts to get family members involved in student activities and find ways to ensure that Latina students feel supported in the college campus context. It may even be helpful to implement mental health literacy programs with family members of students as well. These programs do not necessarily have to be specific to families of Latina college students, but greater efforts may be made in make sure that Latinas' families are involved. This may require that programs be delivered in English and in Spanish. However, the more people who are knowledgeable of the mental health and substance use problems among Latina college students and the resources there are to help them, the more likely symptoms will be detected and Latina students will be encouraged to seek and utilize services.

One way to target Latina college students for such programs would be to connect with organizations that already focus on this population. Hispanic sororities may be a good organization to help target Latina college students. It may also be useful to collaborate with campus ministry services given the importance of religiosity Latina college student mental health and service utilization. Multicultural centers and existing interventions to increase retention among Latina/o college students may also be good outlets for targeting Latina college students at-risk.

Mental health literacy programs may be delivered in person, but there is also evidence that these programs can be successfully delivered via the internet (Jorm & Kelly, 2007). This may be a more cost effective and efficient way to increase awareness and knowledge of the mental health and substance use problems among Latinas. In fact, it could be mandated that every incoming student has to take an on-line mental health literacy min-course before they are eligible to enroll. This would not only ensure that

Latina college students were receiving such information but that all college students received this important information. Likewise, it could be mandatory for all faculty, staff, and administration to take an online mental health literacy mini-course when they are first hired and then refresher courses every few years that include information on new trends and services within their college campus community.

Although it may not be feasible or necessary to create prevention and intervention programs specifically for Latina college students, it is essential that those who are working with these students acknowledge and respect cultural differences. For example, it is important that service providers understand cultural issues regarding substance use among Latinas. Not only may they need to more thoroughly assess for substance use given that Latinas may be more reluctant to disclose such behaviors, but they may also need to make sure to create space where Latinas feel safe enough to do so. However, not all Latinas are alike. It would be difficult for a single service provider to memorize all the differences between the various Latina/o subgroups. A better approach would be to ensure that service providers are trained in cultural sensitivity. This would prepare them to be open and exploratory allowing the client to reveal their cultural beliefs and values rather than the therapist "assigning" beliefs and values based on the client's cultural background. This is a particularly important approach to have when working with Latina/o populations (Bernal, Bonilla, & Bellido, 1995), but may also be useful among all college students given that everyone has a unique cultural background and history.

Implications from this dissertation are clearly important for campus mental health service providers including clinical social workers and psychologists. However, given that the rates and severity of mental health problems have increased in college students in

general (Blanco, et al., 2008; Kitzrow, 2003), campus mental health centers are being overburdened with students. This may lead to students increasingly being referred out into the community to get help. Thus, clinical social workers and psychologists outside the college campus may also benefit from the information provided in this dissertation regarding the mental health needs of Latina college students and how to address them.

Future direction

This dissertation provides information to better understand and address the mental health needs of Latina college students. However, this is only the beginning. As evidence throughout this discussion, there are many topics that require further exploration and many questions that remain unanswered.

To further findings from this dissertation, a qualitative exploration of perceptions of mental illness and services will be conducted with Latina college students from the HMS. Latina students will be recontacted and asked to participate in in-depth virtual interviews. The purpose of these interviews is to get a better sense of how Latinas' culture and ethnic identity influences the way they conceptualize mental health problems and how these conceptualizations influence service use. Given the importance of family and interpersonal relationships among Latinas, Pescosolido's model of service use that suggests that all service utilization is influenced by an interpersonal interaction (Pescosolido, Gardner, & Lubell, 1998) will be used to explore the role of these relationships in conceptualizations and pathways to service use.

This dissertation also highlighted a need for further research in the risk of eating disorders among Latina college students. It is well established that there is a high prevalence of eating disorders and disordered eating behaviors on college campuses

(Heatherton & Baumeister, 1991; Mazzeo, 1999). Study three revealed that Latinas presented with eating disorder symptoms of anorexia and binge eating. However, there were no measures of bulimia and the measures for anorexic and binge eating symptoms were limited in that they did not allow for actual diagnosis. Previous research supports that Latinas are an at-risk population for eating disorders (Granillo, et al., 2005; Robinson, et al., 2001) and given the negative psychological, physical, and interpersonal consequences of untreated eating disorders it is essential that we get a better understanding of these complicated and sometimes deadly disorders among Latinas.

There is also a need to understand if there are differences in mental health and substance use problems and service utilization among the different Latina subgroups. Although this data exists in the general literature on Latina/o mental health, the college campus context is quite unique and may impact Latina subgroups differently than in the community. For example, whereas more recent Latina/o immigrants tend to have less mental health problems (M. Alegria, et al., 2008), this may not be true of Latina/o students who are recent immigrants. According to data from this dissertation the percentage of foreign-born Latina students was incredibly low, which may increase risk of mental health problems due to more frequent experiences of isolation and feeling as though one does not belong. It would also be important to know if certain Latina subgroups are more likely to attend college than others or if there are regional differences. Knowing if Mexican and Mexican-American females are more likely to attend colleges on the west coast or in the southwest and Dominican and Puerto Rican females are more likely to attend colleges on the east coast could help service providers,

faculty, and administration to know which Latina populations they should be tailoring their programs for.

Finally, future research needs to focus on evaluating the quality of campus mental health services. It is possible that Latina college students are not using services because they have heard that they are inadequate. It is important to know if campus mental health providers using evidence-based practices. Are they trained and practicing cultural sensitivity? Are there Latina/o or Spanish-speaking service providers? Evidence suggests that Latina/o college students prefer therapists that share the same cultural background as them (Lopez, Lopez, & Fong, 1991). However, there is no evidence to support that therapist-matching on race/ethnicity improves therapeutic outcomes (Shin, et al., 2005). Sue and colleagues (1999) suggest that the credibility of the therapist is more important than their race/ethnicity. Thus, we have to ensure that campus mental health service providers are well trained and competent and the services they are providing are appropriate and effective.

This dissertation was the first to specifically focus on the mental health needs of Latina college students. The knowledge gained from the three studies will not only fill several gaps in the literature, but will also serve to inform practices and policies aimed at helping this at-risk population. Latina college students like Isabella who have the goal of obtaining their college degree in the hopes of improving their lives and the lives of their families deserve ample opportunity to do so. However, with mental health and substance use problems their chances of achieving their educational goals decrease. As social workers and psychologists it is our mission and thus our duty to help individuals like Latina college students who are at-risk and often marginalized in the college campus

context. This dissertation sheds light on some of the specific problems Latina college students are facing and how to possibly address these problems. However, more research is needed to ensure that Latina college students are able to take full advantage of their educational opportunities, which will increase the likelihood of future success and improve their overall quality of life.

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