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Research report

The prevalence and correlates of depression, anxiety, and stress in a sample of college students

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ABSTRACT

Background: Over the past four years, the Franciscan University Counseling Center has reported a 231% increase in yearly visits, as well as a 173% increase in total yearly clients. This trend has been observed at many universities as mental health issues pose significant problems for many college students. The objective of this study was to investigate potential correlates of depression, anxiety, and stress in a sample of college students.

Methods: The final analyzed sample consisted of 374 undergraduate students between the ages of 18 and 24 attending Franciscan University, Steubenville, Ohio. Subjects completed a survey consisting of demographic questions, a section instructing participants to rate the level of concern associated with challenges pertinent to daily life (e.g. academics, family, sleep), and the 21 question version of the Depression Anxiety Stress Scale (DASS21).

Results: The results indicated that the top three concerns were academic performance, pressure to succeed, and post-graduation plans. Demographically, the most stressed, anxious, and depressed students were transfers, upperclassmen, and those living off-campus.

Conclusions: With the propensity for mental health issues to hinder the success of college students, it is vital that colleges continually evaluate the mental health of their students and tailor treatment programs to specifically target their needs.

1. Introduction

According to a recent study conducted by the Anxiety and Depression Association of America (n.d.), seven out of 10 United States adults claim to experience stress or anxiety at least at a moderate level on a daily basis. While stress is an inevitable part of life, it is very present (Blanco et al., 2008) and becoming more prevalent among university students (Gallagher, 2008; Mackenzie et al., 2011). In addition to anxiety and stress, depression can also impact college life to such an extent that in-depth research is necessary in order to help future students. In the USA, almost 10% of university students have been diagnosed with, or treated for, depression over the past 12 months (Wolfram, 2010). However, only about half of the people in America suffering from a diagnosed case of depression are treated for the disorder (NIH, 2010).

Increasingly, obtaining a college degree is seen as the key to success (Thurber and Walton, 2012), and with many students leaving their home state to attend a post-secondary school, the transition itself can be a cause of depression, anxiety and stress. The transition into a post-secondary school has been reported to be associated with appetite disturbance, concentration problems and depression (Lee et al., 2009; Price et al., 2007). Homesickness is a direct byproduct of this transition that affects university students, mainly freshmen (Thurber and Walton, 2012), and is therefore an important focus for universities looking to properly treat the mental health problems plaguing their students.

Academics are an integral part of the life of all college students, and without a healthy attitude toward academic goals, students can be plagued with crippling bouts of stress. Academic pressures of meeting grade requirements, test taking, volume of material to be learned and time management has been shown to be a significant source of stress for students (Crocker and Luhtanen, 2003; Kumaraswamy, 2013; Misra and McKean, 2000). While academics can be perceived as a positive challenge, potentially increasing learning capacity and competency, if viewed negatively, this stress can be detrimental to the student's mental health (Kumaraswamy, 2013; Murphy and Archer, 1996).

In order for universities to tailor treatments to the specific needs of their students, it is important to understand what other aspects of life, in addition to academics, may be causing this increase in depression, anxiety, and stress. For example, negative perceptions of body image have been shown to be linked with increased likelihood of depression and anxiety in adolescents

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(Kostanski and Gullone, 1998; Lifespan News, 2006), as well as low satisfaction in life, low self-esteem and feelings of inferiority that may result in significant impairment of social, occupational and educational functioning (Goswami et al., 2012). Students who grew up in families lacking financial stability are more likely to show symptoms of depression and anxiety (Eisenberg et al., 2007), indicating that financial difficulties correlate with higher rates of these mental health problems. Studies also indicate that poor sleeping habits have a negative impact on academic performance and mental health complaints, with women reporting poorer sleep habits than men (Orzech et al., 2011).

The negative side effects of depression, anxiety, and stress demonstrate the importance of treating their incidence among college students. For example, depression is correlated with detrimental behaviors such as smoking, poor diet, lack of exercise, poor sleep habits, and noncompliance with medical treatment recommendations (Doom and Haeffel, 2013). People with anxiety disorders also report a worse quality of life than people without high levels of anxiety (Barrera and Norton, 2009). It can also be beneficial for universities to understand what aspects of life correlate with a decrease in depression, anxiety, and stress symptoms in order to encourage those behaviors in their students. For example, studies have shown that those college students who have satisfactory relationships with family and friends are more likely to have overall life satisfaction (Diener and Diener, 1995).

The Franciscan University Counseling Center reports that the prevalence of counseling requests is highest three to four weeks into the semester and also after mid-terms. In the school year of 2007/08 there were 196 clients totaling 1000 visits with an overall diagnosis of depression. That number almost doubled in the year 2012/13 with 340 clients totaling 2311 visits with an overall diagnosis of anxiety and depression. This study was designed to investigate the potential factors that may correlate with the increase in student visits to the counseling center at Franciscan University. It is hoped that the findings of this study would give some insight into the main behaviors or factors associated with depression, anxiety and stress throughout the university's student body, as well as potentially other universities of similar, or larger, size.

For the purpose of this study, the DASS 21 was utilized to assess the relative prevalence of the depression, anxiety and stress (Lovibond and Lovibond, 2004; Henry and Crawford, 2005). The characteristics associated with high scores on each DASS scale are as follows: Depression: "self-disparaging, dispirited, gloomy, blue, convinced that life has no meaning or value, pessimistic about the future, unable to experience enjoyment or satisfaction, unable to become interested or involved, slow, and lacking in initiative"; Anxiety: apprehensive, panicky, trembly, shaky, aware of dryness of the mouth, breathing difficulties, pounding of the heart, sweatiness of the palms, worried about performance and possible loss of control"; and Stress: "over-aroused, tense, unable to relax, touchy, easily upset, irritable, easily startled, nervy, jumpy, fidgety, and intolerant of interruption or delay" (PFA, 2013).

2. Methods

In compliance with Federal Law, requiring that all researchers conducting testing on human participants must complete training on the protection of research subjects, all survey administrators completed the Protecting Human Research Participants training module provided through the NIH Office of Extramural Research and certification is kept on file for documentation purposes by the principal investigator, Dr. Stephen Sammut. Prior to administration of the survey, IRB approval was obtained (2013–12).

Participants were recruited for this study using convenience sampling and were students in classes at Franciscan University. Classes were selected across disciplines offered at the university. Permission was obtained from professors prior to surveys being administered during their class period. Over the course of three weeks, the survey was administered by a proctor in the selected classes.

Prior to completing the survey, each student signed a consent form that detailed the nature of the study and explained that participation in the study implied consent to analyze their responses. They were also assured of the confidentiality of their responses. Each survey filled both sides of a single sheet of paper and consisted of a demographics section, a list of stressors, and the standard 21 question DASS. The projected time of administration and completion of the survey was approximately 10 min. The instructions indicated to students that they should take their time and that there were no right or wrong answers. Students had to be within the age range of 18–24 and no surveys were included in the analysis from participants outside of this age range. Surveys were also excluded from analysis if participants failed to include their age, sex, year in school or if they left more than one question blank in the depression, anxiety, or stress categories of the DASS questions. On the basis of these criteria, from the original 407 surveys distributed, a total of 374 surveys were deemed valid and analyzed. This sample size is representative of the student body at Franciscan University.

Demographic Information: the survey inquired about the age, gender, marital status, household membership (faith-based fraternal associations), home state, nature of home location (rural, urban, or suburban), major, type of current housing accommodations, hours worked per week, hours spent on non-academic activities per week, and whether the participant transferred from another school.

DASS (Depression, Anxiety, and Stress Scale): The survey included the 21 question version of the DASS (Lovibond and Lovibond, 2004). The purpose of the questions is to "assess the severity of the core symptoms of depression, anxiety, and stress" (Gomez, n.d.). Each question measured the prevalence of symptoms of depression, anxiety, or stress over the prior week. Answers were reported on a four point Likert scale (0–3). A score of 0 indicated that the item "did not apply to them," and a score of 3 meant that the participant considered the question to apply "very much, or most of the time" (Gomez, n.d.). The DASS 21 is not intended to diagnose disorders relating to depression, anxiety, or stress.

Stressor evaluation: the second portion of the survey consisted of a series of common stressors that were deemed to be pertinent to college students in prior research (APA, 2009, 2014; Bryne et al., 2007; Han et al., 2000; Healthline, n.d.; Ross et al., 1999; Sharma and Agarwala, 2013; Thurber and Walton, 2012; van den Eijnden et al., 2008). Answers were reported on a Likert scale (0–4) and indicated the significance of each life stressor. Answers ranged from "not at all significant" to "extremely significant." As it was predicted that students would exhibit increased levels of stress in the time period around midterm and final examinations, we purposefully avoided those periods of the semester in order to reduce the possibility of a significant influence on the interpretation of the results.

3. Results

3.1. Demographics

The gender distribution of those surveyed closely resembled the gender distribution of the student body at Franciscan

University (FUS, 2014), with 37% of subjects being males and 63% being female. 30% of subjects surveyed were freshman, 26% were sophomores, 22% were juniors, and 22% were seniors. 67% of those surveyed lived in the campus dormitories, 12% lived in Assisi Heights (university-provided apartments available to juniors and seniors), 18% lived in off-campus housing, and 3% lived on lower campus (motel-style dorms located on the periphery of the main campus).

3.2. DASS 21

The scoring of the DASS 21 ranks each participant's depression, anxiety, and stress levels, classifying each area as either "normal," "mild," "moderate," "severe," or "extremely severe." Of those surveyed, 11% reported symptoms of severe or extremely severe levels of stress, 15% indicated severe or extremely severe anxiety, and 11% severe or extremely severe depression (Fig. 1).

A Spearman's correlation revealed that the level of concern for each aspect of life had a significant positive correlation with depression, anxiety, and stress levels ($p < .05$), except for the correlation between anxiety scores and physical activity, which only indicated a tendency towards significance ($.05 < p < .1$). The top 10 sources of concern for students, based on the percentage of participants indicating "moderate source of stress" or "extreme source of stress" were as follows: academic performance, pressure to succeed, post-graduation plans, financial concerns, quality of sleep, relationship with friends, relationship with family, overall health, body image, and self-esteem (Fig. 2).

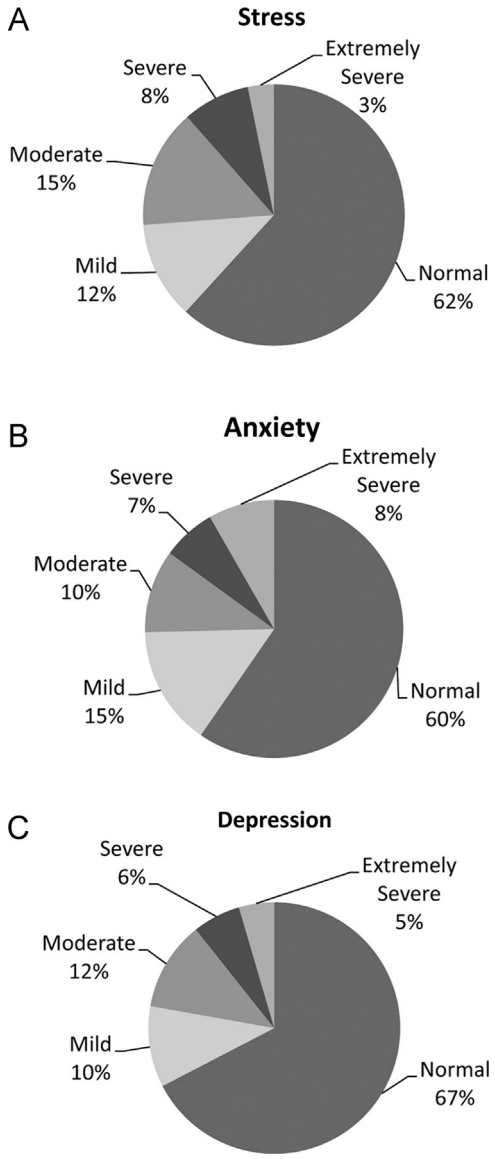


Fig. 1. The proportion of participants whose answers on the DASS 21 indicated a normal, mild, moderate, severe or extremely severe amount of stress (A), anxiety (B), and depression (C).

3.3. Upperclassmen

A one-way ANOVA revealed an overall significant difference, $F(3,369)=3.212$, $p < .05$, $\eta^2=.025$, of average stress scores across the years of college. A post-hoc analysis using the Tukey test indicated a significant difference in the mean of the stress scores of juniors and freshmen, $p < .05$, and a tendency toward significance between Seniors and Freshmen, $p=.05$, with upperclassmen scoring higher in both instances. All other combinations showed no significant difference in stress scores, $p > .05$.

3.4. Off-campus students

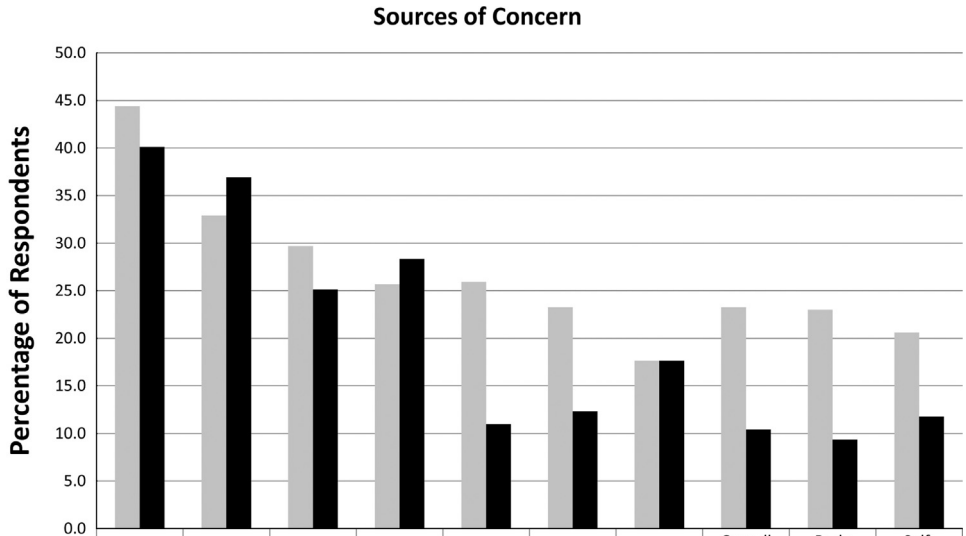
An ANOVA comparing anxiety scores across the different options for housing revealed an overall tendency towards a significant difference, $F(3, 369)=2.622$, $p=.05$, $\eta^2=.02$. A post-hoc Tukey test revealed a tendency toward significance between anxiety scores of students in the dorms and students living off-campus, $p=.065$, with students living off-campus showing a higher average anxiety score. All other combinations of living status showed no significant difference in anxiety scores. An ANOVA comparing the means of depression scores across different housing options revealed an overall significance, $F(3, 369)=2.941$, $p < .05$, $\eta^2=.023$. However, a post-hoc Tukey test only showed tendencies toward significance between average depression scores of students in Assisi Heights and students living off-campus, $p=.055$, as well as between students living off-campus and students living in the dorms, $p=.072$. In both cases, off campus students scored higher on the depression portion of the DASS. All other combinations of living status showed no significant difference in depression scores. An ANOVA comparing stress scores across living status returned an overall significant difference, $F(3, 369)=3.271$, $p < .05$, $\eta^2=.026$. A post-hoc Tukey test showed a significant difference in the stress scores of students living in the dorms and students living off campus, $p < .05$. All other combinations of living status showed no significant difference, $p > .05$ (Fig. 3).

3.5. Sex differences

Relative to sex differences, a 2-sample test for equality of proportions revealed that a significantly greater proportion of females than males reported that academics were an "extremely significant" source of stress, $p < .05$; that body image was "moderately significant" source of stress, $p < .05$; and that body image was an "extremely significant" source of stress, $p < .01$. A similar analysis revealed a tendency toward significance between males and females indicating that sleep was a "moderately significant" source of stress, $p=.051$, and that self-esteem was an "extremely significant" source of stress, $p=.096$. In both cases, the proportions of females were larger than the proportions of males (Fig. 4).

3.6. Transfer students

A Welch two-sample t-test showed that transfer students were significantly more anxious than non-transfer students, $t(148)=-2.66$, $p < .01$, $r^2=.046$. While the mean of stress and depression



	Academics	Success	Post-Grad	Finances	Sleep	Friends	Family	Overall Health	Body Image	Self-Esteem
Moderate	44.4	32.9	29.7	25.7	25.9	23.3	17.6	23.3	23.0	20.6
Extreme	40.1	36.9	25.1	28.3	11.0	12.3	17.6	10.4	9.4	11.8

Fig. 2. The top 10 sources of concern based on percentage of participants answering "moderately" or "extremely" to each question.

scores for transfer students were slightly higher than for non-transfer students, the differences were not statistically significant, $p > .05$.

4. Discussion

While one of the initial goals of this survey was to narrow down possible correlates of depression, anxiety, and stress, all the potential sources of concern indicated on the survey had a significant positive correlation with levels of depression, anxiety, and stress. Of the 19 sources of concern surveyed, the 10 that caused the most concern were academic performance, pressure to succeed, post-graduation plans, financial concerns, quality of sleep, relationship with friends, relationship with family, overall health, body image, and self-esteem. When the scores for anxiety, depression, and stress were compared to living status, those students who lived off-campus were the most stressed, anxious, and depressed. In addition, transfer students scored the highest in the three areas measured by the DASS 21, with a significant difference in anxiety levels between transfer and non-transfer students. Lastly, upperclassmen scored the highest on the depression, anxiety, and stress scales when compared with underclassmen.

To some extent, the first four concerns listed above directly relate to college student life. For example, the goal of college is to ultimately become educated, find a job after graduation, and feel some level of personal success. It is therefore not surprising, and even understandable, that four of the top 10 sources of concern were academics, success, post-graduation plans, and finances. While it is unlikely that these concerns will be eliminated completely, the results highlight the importance of programs addressing areas such as study skills and job searches.

Regarding finances, the high level of concern is most likely a result of more than simply the financial cost of going to college. For many students, college is the first time that they are living away from home and are responsible for the cost of everyday living expenses, such as food, clothing, rent, and utility bills. The great stress that financial concerns place on students indicates that financial responsibility classes that teach students how to formulate a budget and save money, among other useful financial skills, may serve to reduce the stress of college students.

The remaining 6 areas of concern (sleep, friends, family, overall health, body image, and self-esteem) are related to both personal and interpersonal facets of daily life. Again these results indicate the need for universities to address the personal well-being of students to the same level they foster professional success. Previous research conducted on college students has identified areas of concerns similar to the results noted above, including areas such as academics, the future, relationships, and personal health (Hurst et al., 2012; Kumaraswamy, 2013; Sreeramareddy et al., 2007).

Our results also indicated that those students living off campus ranked the highest in levels of stress, anxiety, and depression when compared to students living on-campus. These results concur with previous research that has shown an increased incidence of mental health challenges in those students who live off-campus (Eisenberg et al., 2007; Gillman et al., 2006; Lester, 2013; Omokhodion and Gureje, 2003; Othieno et al., 2014). One factor most likely influencing this outcome is the fact that those students who live off-campus have the added stress of paying rent each month, planning and preparing meals, and addressing any problems that may arise in their house or apartment. These results raise the need for universities to educate those students planning to live off-campus with respect to the responsibilities associated with signing a lease and living independently. These students should also be encouraged to evaluate their preparedness and ability to handle the personal and financial responsibility that comes with moving off-campus in addition to the usual stressors of college and work.

In addition, our results indicated that transfer students were more anxious, stressed, and depressed than non-transfer students. While moving schools in the middle of one's college career presents inevitable hardships for the student, the higher scores in all three emotional states surveyed indicate that these students may benefit from additional programs that help them integrate themselves more easily into their new school. While there has been a multitude of studies published examining the academic performance of transfer students (e.g. Cejda, 1997; Ishitani, 2008), Laanan (1996), in his research examining the experience of transfer students, notes that there is a dearth in research related to the psychological well-being of transfer students as a group. The results outlined above, as well as the lack of understanding of the

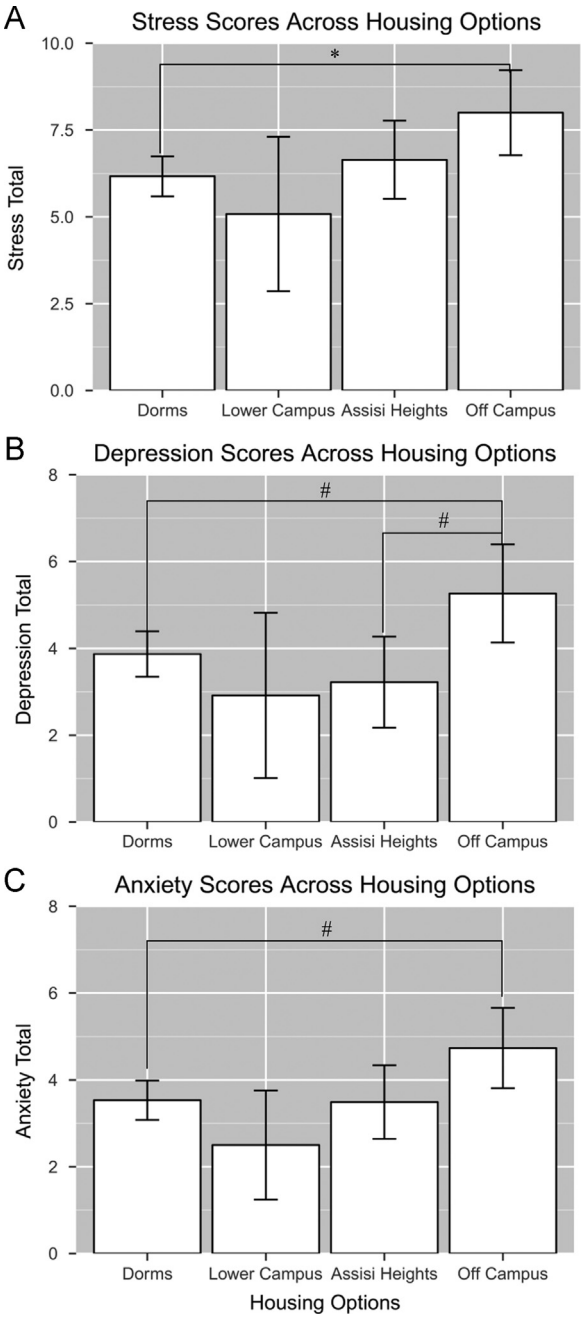


Fig. 3. Mean scores of stress (A), depression (B), and anxiety (C) of students across housing options. #.05 < p < .1 (tendency toward significance), *p < .05.

mental health of transfer students, indicate a need for further research on this particular topic.

Lastly, upperclassmen were the most stressed, anxious, and depressed when compared with freshman and sophomores. While most schools have programs to help freshman settle into college life, as well as to help seniors prepare for jobs or graduate school, these results indicate that plans may be necessary to prepare juniors for what they will need to accomplish in their senior year and hopefully reduce their stress, anxiety, and depression. Previous research has also demonstrated an increase in depression levels in older students (Bostanci et al., 2005; Naushad et al., 2014), with Mahmoud et al. (2012) reporting the highest levels of anxiety and stress in juniors. However, researchers Bayram and Bilgel (2008) conducted a study of university students in Turkey and reported that freshman and sophomores had the highest levels of depression, anxiety, and stress. This discrepancy highlights the need for further in-depth research into the specific stressors for each university grade level in order to properly treat and care for all university students.

This study has revealed potential sources of concern within our university community of students, as well as specific demographic groups that have the highest incidences of symptoms of depression, anxiety, and stress. We believe that the results outlined above will be beneficial to other universities, both of a similar size to Franciscan University as well as larger institutions as they seek to address student needs. However, it would most likely be helpful for other institutions to repeat this study in order to identify possible variations in correlates that may arise in student bodies that differ in demographic makeup from Franciscan University. Other possible avenues of inquiry would be research investigating why off-campus students and juniors are the most stressed, depressed, and anxious as well as types of interventions that would be beneficial in relieving depression, anxiety, and stress in college students.

From a treatment perspective, many schools, including Franciscan University, already have programs in place (Enright et al., 2000; Hamdan-Mansour et al., 2009; Thompson et al., 2010). It is evident, based on our results and the literature reviewed above, that the prevalence of symptoms as well as clear demographic correlates indicate a need for an increase in the number and scope of such programs addressing depression, anxiety, and stress, as well as the most prevalent concerns of its students. In addition to treatment and prevention programs, it may also be beneficial for universities to encourage organizations (e.g. Active Minds, National Alliance on Mental Illness, To Write Love on Her Arms) that promote awareness about mental health and seek to remove the social stigma associated with such problems (McKinney, 2009).

A further implication of this study, and possibly one of the most important, is the need for universities to implement a systematic and continuous method to monitor the mental health of their students. It is a common practice for institutions to continuously collect survey data about drug and alcohol use and professor performance. We are suggesting that, given the multitude of students in this study indicating extreme depression, anxiety, and stress, as well as the overall increasing trend of severe psychological symptoms in college students (Benton et al., 2003; Hunt and Eisenberg, 2010), universities should consider implementing a similar type of survey to evaluate the psychological health of their students on a regular basis. This type of monitoring, along with increased availability of programs, would allow universities to evaluate the mental health needs of their students as well as asses and improve the efficacy of their existing counseling programs. Moreover, collaboration and sharing of information between university counseling centers and student life, as well between universities, could prove beneficial in the effort to reduce the psychological suffering of college students.

5. Limitations

One limitation of this study was the fact that the definition of "extracurricular activities" was not clearly stated and was left up to the interpretation of the participants. Because all participants were not utilizing the same working definition of extracurricular activities, answers for the question "how significant are extracurricular activities as a source of stress in your life" become less comparable across participants. For example, participants may or may not have included time spent in academic-based clubs not directly related to class work in their definition of "extracurricular activities".

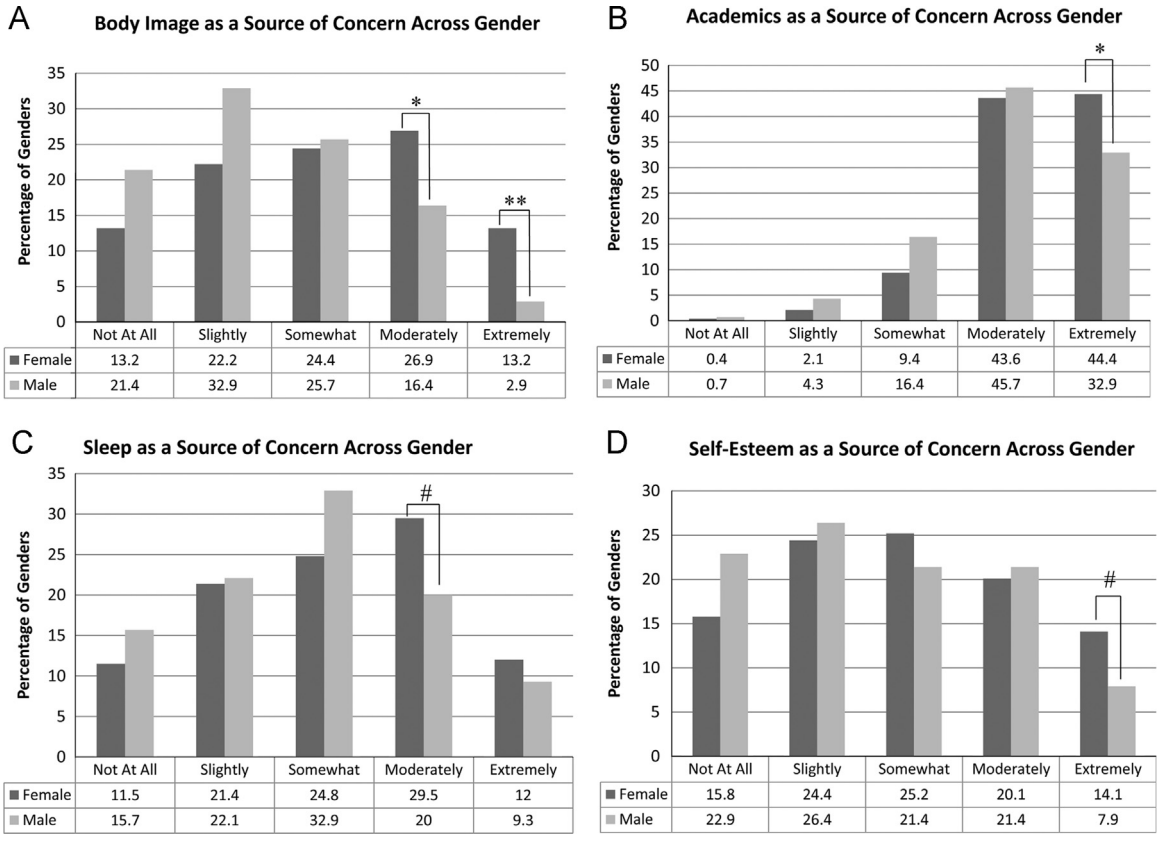


Fig. 4. Proportions of male or female subjects responses across levels of concern reflecting differences between the sexes (body image, self-esteem, academics, and sleep). #.05 < p < .1 (tendency toward significance), *p < .05, **p < .01.

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Conflict of interest

No authors of this paper have any conflicts of interest.

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