

# A Man's Best Friend, A College Student's Secret Weapon

By

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# ABSTRACT

Students in college are stressed for many reasons, such as struggles in finances, time management, academic pressure, and preparing for life after college. In order to succeed, there are multiple methods that students use to reduce this stress and minimize the potential effects of their stress on their learning and academic work. Physiologically, stress causes increased cortisol which has the possibility to inhibit learning and success in academics. A survey of STEM and Non-STEM undergraduate University of Arizona students shows that there are multiple preferred ways to reduce stress including practicing mindfulness, working out, or connecting with friends and family. A majority of student respondents also indicated that interaction with dogs would be a plausible method to mitigate stress. Recommendations from the trends in data suggest that access and frequency of therapy dog interactions for students can improve their lives, reducing stress and possibly cortisol levels, leading to improved learning and academic success.

# ACKNOWLEDGMENTS

I would first like to thank Paula and her dog Boomer (as a part of [Pet Partners of Southern Arizona](#)) for being part of an inspiration to this thesis. I also want to acknowledge Kerri Rodriguez, the Assistant Professor in the College of Veterinary Medicine and the director of the Human-Animal Bond lab for the discussion about the benefits of dog therapy.

Finally, I owe much of my gratitude to my thesis mentor, Dr. Rankin. You have been my biggest supporter and helped me continue to propel this project, and I could not have done it without you.

## INTRODUCTION

College students are stressed. Almost anyone you meet would agree with this statement, but how they manage stress to reduce its impact on their academic success is extremely variable. Students attending college are facing issues such as deciding their life goals and plans to achieve them, financial decision-making, achieving good grades, fostering relationships, managing their time, keeping up with their physical and mental health, and the everyday stressors that come with finding themselves in their early twenties (Bhargava & Trivedi, 2018). Harmful stress levels can lead to reduced ability to learn and perform poorly in their classes, which, in turn, can cause mental and physical health to decline even further (Vogel & Schwabe, 2016).

Universities offer a wide variety of resources to help students reduce their stress and learn how to manage it, such as counseling services, career guidance, and interactive events, such as crafting, cooking, musical performances, and even dog therapy sessions. It is the hope that by reducing stress, the physiological stress response, (i.e. specifically the increased release of the hormone cortisol) will also be reduced and enable an increase in academic success (Kandhalu, 2013). The focus of this thesis is whether interaction with dogs could serve as an effective approach to reducing stress in university students and thus lead to improved academic performance.

Boomer the Pet Therapy Dog:



## BACKGROUND

This thesis is focused on the impairment of college students' academic success due to extreme levels of stress, resulting in increased cortisol levels which cause negative physiological and mental effects (Kandhalu, 2013). While there are many ways to mitigate stress, the relatively easy and low-cost alternative of interacting with dogs may have a positive effect on this by decreasing stress levels, therefore decreasing cortisol levels, improving student health and academic performance.

### **Effects of Stress on Students and Their Educational Outcomes**

Students accrue considerable stress not only from their academic work, but also from social stressors, health issues, financial stress, life events, fear of failure, and future planning (Reddy, et.al., 2018). High stress levels have been shown to inhibit learning and can cause poor academic performance. In a study conducted with undergraduate and postgraduate students from educational institutions in

Rawalpindi/Islamabad, the authors found a significant positive relationship between academic stress and students' depression levels (Deng, et.al., 2022); that is, the higher a student's stress level, the greater their depression. The data then suggested that these higher levels of depression had a significant negative effect on academic performance (Deng, et.al., 2022). On the other hand, Travis et.al. described good stress as stressors that are surmountable creating a challenge for the person, resulting in positive outcomes. However, uncontrollable stressors cause a hindrance to the person and can damage performance (Travis, et.al., 2020).

### **The Physiology of the Stress Response**

The human stress response is induced by physical or psychological stimuli (stressors) that disrupt homeostasis in the body (Reddy, et.al., 2018). This response is an adaptive response that involves the nervous, endocrine, and immune systems. The endocrine system is responsible for the regulation of creating and releasing hormones, which are signaling molecules delivered by the blood to affect the activity of cells and organs (Petersson, 2017).

The hormone cortisol is produced by the hypothalamic-pituitary-adrenal (HPA) axis and released in response to stressors (Refer to Figure 1) (Dedovic, et. al., 2009).

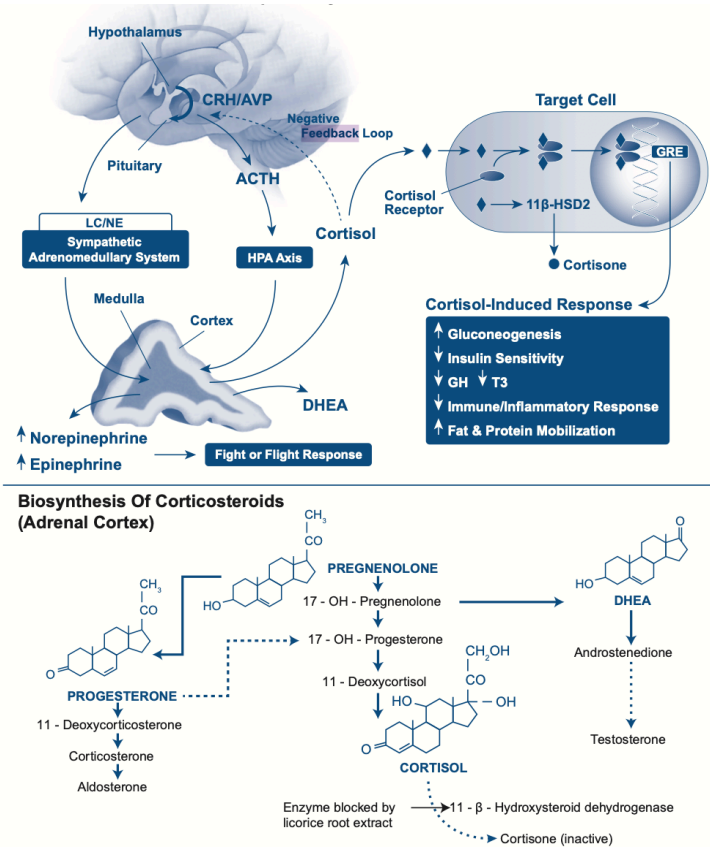


Figure 1: The HPA Axis and Stress Response System (Guilliams & Edwards, 2010)

The first step in the release of cortisol is that the paraventricular nucleus (PVN), a part of the hypothalamus, releases corticotropin-releasing hormone (CRH). CRH then stimulates the release of adrenocorticotrophic hormone (ACTH) from the pituitary gland into the blood. Once ACTH travels to the receptors in the adrenal cortex, about 15 minutes after the onset of the stress stimulus (Hannibal & Bishop, 2014), it binds and causes the secretion of cortisol (Jayasankara, et.al., 2018).

Short-term stress also causes the release of norepinephrine (NE) and epinephrine (Epi). The sympathetic-adrenal-medullary (SAM) axis causes a rapid response, increasing the secretion of NE and Epi from the adrenal medulla and increased secretion of NE by the sympathetic nerves. This elevates the level of both NE

and Epi in the brain, which also results in increased blood pressure, heart rate, sodium retention, oxygen consumption, and thermogenesis (Chu, et.al., 2022). This rapid response within the central nervous system then contributes to increased cognition, focused attention, and enhanced alertness as well as an up-regulation of needed functions for responding for responding to the stressful situation (Chu, et.al., 2022). These prove to be beneficial to people experiencing short-term levels of stress; however, once the stress occurs for longer periods, it has net effects that reduce cognition (Scholey, et.al., 2014). This also indicates that any behavioral interventions taken for stress reduction could therefore lead to an increase in cognition (Scholey, et.al., 2014).

Cortisol increases glucose levels in the blood, escalates the brain's utilization of glucose stores, and increases cytokines that are involved in tissue repair (Mayo Clinic, 2023). The body may further experience "a suppressed immune system, insomnia, severe mood swings, depression, and severe hypotension" (Kandhalu, 2013). Other physical responses to an increase in cortisol are decreased REM sleep, and increased time awake during the sleep cycle (Kandhalu, 2013). These physiological effects act counter to academic performance, as well as the general well-being of people experiencing consistent stress.

### **Stress Reduction Activities**

Stress reduction activities are continuously evolving. Some examples of these include creating art, reading, mindfulness, exercise, engaging with nature, and human-animal interactions (Smytha, et.al., 2020). A 2016 study focused on assessing

salivary cortisol levels before and after 45 minutes of making art (Kaimal, et.al., 2016). The researchers found that cortisol lowered with statistical significance, and the written reflections indicated that the participants felt the activity was relaxing and enjoyable (Kaimal, et.al., 2016). In a combination of studies focused on meditation intervention, as a method of stress relief, changes in cortisol levels were found (Koncz, Demetrovics, & Takacs, 2021). Following meditation, they found significant decreases in blood cortisol levels through blood testing and a subset of the saliva tests from those living in stressful situations. The authors did identify a limitation in their experiment: the population who participated in the blood sample collections had a larger proportion of at-risk subjects, potentially causing a larger effect on the change in cortisol.

### **Dogs Reduce Perceived Stress and Cortisol Levels**

Investigators at the University of Arizona's College of Veterinary Medicine are investigating how human-animal interaction, particularly with a pet dog, boosts a person's well-being (Vanderpool, 2024). By taking saliva samples from military veterans with post-traumatic stress disorder who have service dogs, they have been able to show positive results in the early stages of the study (Vanderpool, 2024). In addition, González-Ramírez explored people's compatibility with their dogs by assessing their perceived stress and happiness levels (González-Ramírez, 2019). Their findings indicate that people who are fully compatible with their dogs have lower perceived stress levels and higher subjective happiness scores (González-Ramírez, 2019).



Several studies have documented that being in the presence of a dog is physiologically beneficial. A study by Pholheber and Matchock (2014) has shown dog interactions to decrease the levels of cortisol and heart rate in participants. McDonald et al. (2017) reported that the group who interacted with a dog during their free time had lower blood pressure levels after the experience. Taken together, data from these studies suggest that future research should investigate how dog sessions can improve and sustain the positive effects from the interaction, using cortisol levels as one of the physiological measurements in addition to self-reporting measures (Thelwel, 2019).

### **Purpose of This Study**

This study was designed to investigate the connections between these previous findings and to demonstrate that interacting with dogs could be an asset to improve student success. This is important because many factors decrease the ability of college students to succeed including social aspects, financial aspects, mental and physical health, and others. The hope is that the outcome of this study can encourage something as simple as interacting with a dog as a way to improve the level of success of students.

## **METHODS**

After conducting a literature review to gather supporting information, an online anonymous survey was conducted, limiting participants to those who are current students at the University of Arizona. By advertising to several classes of primarily undergraduate Physiology students, students in Greek life, and on-campus clubs, the intent was to gather responses from a diverse group in terms of age, gender, and major.

In addition, there were some supplemental comments collected from students about their experience after attending a dog event on campus.

The demographics section of the survey asks about the respondents' academic class status, gender identification, age, and major (See Appendix for Survey Questions). The first content section is focused on questions about stress levels, what impacts student stress, and how you deal with stress. The second section looks at education and the use of resources for stress reduction, leading to the introduction of the idea of dog interaction as a method to reduce stress. The third section investigates on the participant's interactions with dogs: the frequency of interaction, the level of responsibility they have for a dog, and how these make them feel related to stress and academics. It also includes questions about whether there are other animals that the respondent interacts with regularly. Finally, a section includes two open-ended questions for the respondents to provide more personalized responses related to the topic. These questions are "How have your experiences been with animals historically? (Include experiences in your youth, teenage years, and years in college) And how has that affected your responses above?" and "Are there other things you would like to share about your stress levels, interactions with animals, and/or your success as a student?".

The participants were not required to provide an answer to every question before submitting the survey, therefore, some questions have fewer responses than others.

## RESULTS

The online anonymous survey was taken by 58 students: 39 females, 17 males, and 2 unanswered. The survey was created through the University of Arizona's Qualtrics program and was open for two weeks. Percentage values will be provided and analyzed based on the number of responses to each question, and not the total number of people who took the survey to show results that are easier to interpret.

**Question 1: Academic Class Status**

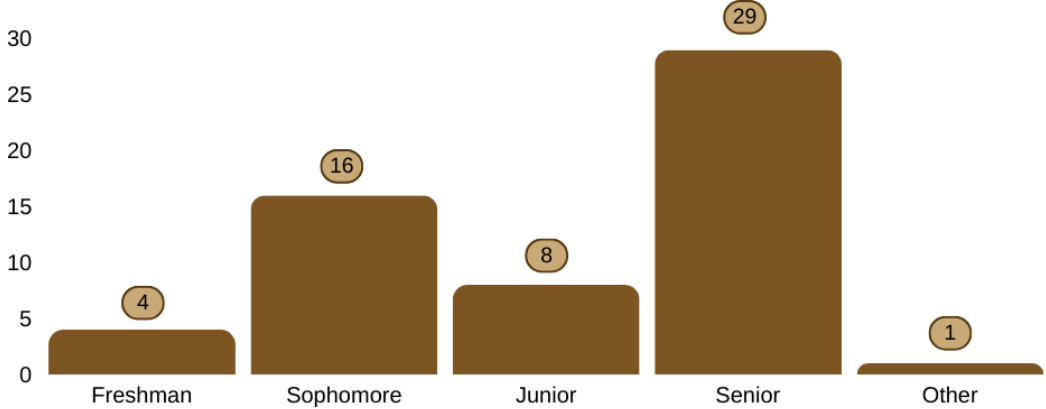


Figure 2

The “Other” option was chosen with a text input that read “5th year”. There was reasonable representation from students in each year of school.

**Question 2: Gender Identification**

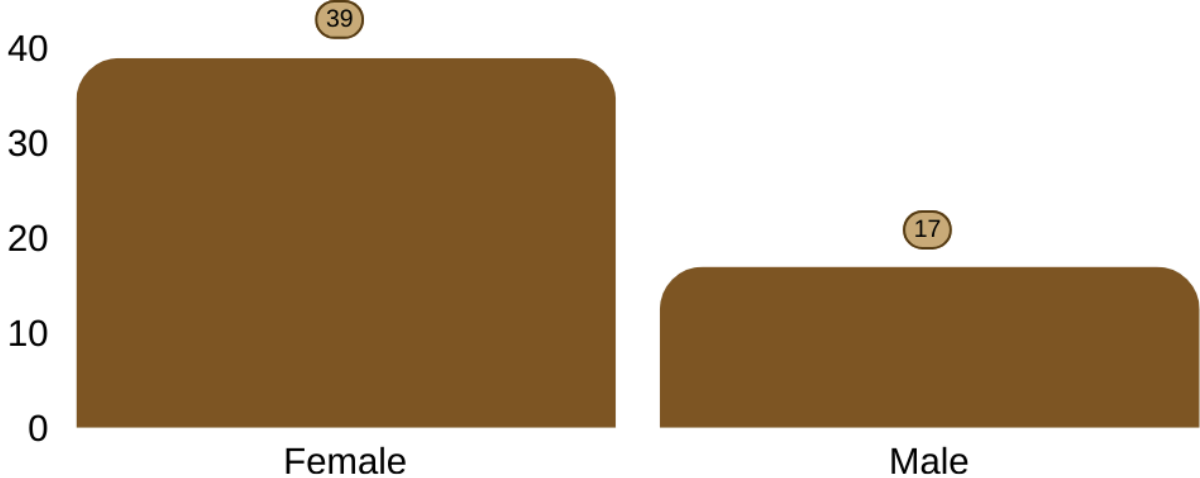


Figure 3

Two survey participants withheld an answer to this question. While there a majority of respondents identified as females, almost a third identified as male.

### Question 3: Age

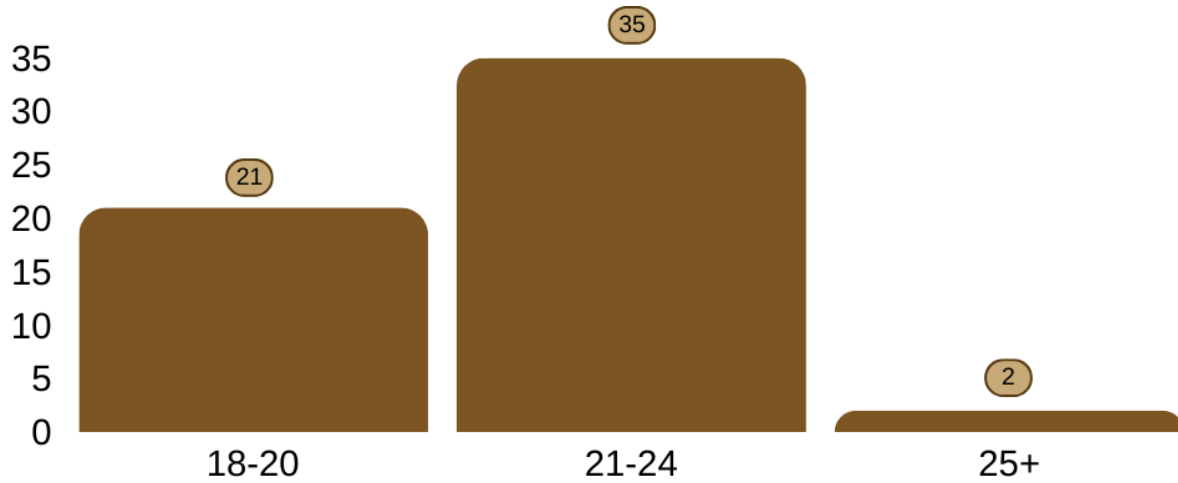


Figure 4

Ages of respondents fell for the most part in the expected age range for college students with an average age of about 21 years old.

### Question 4: Major(s) - Click All that Apply

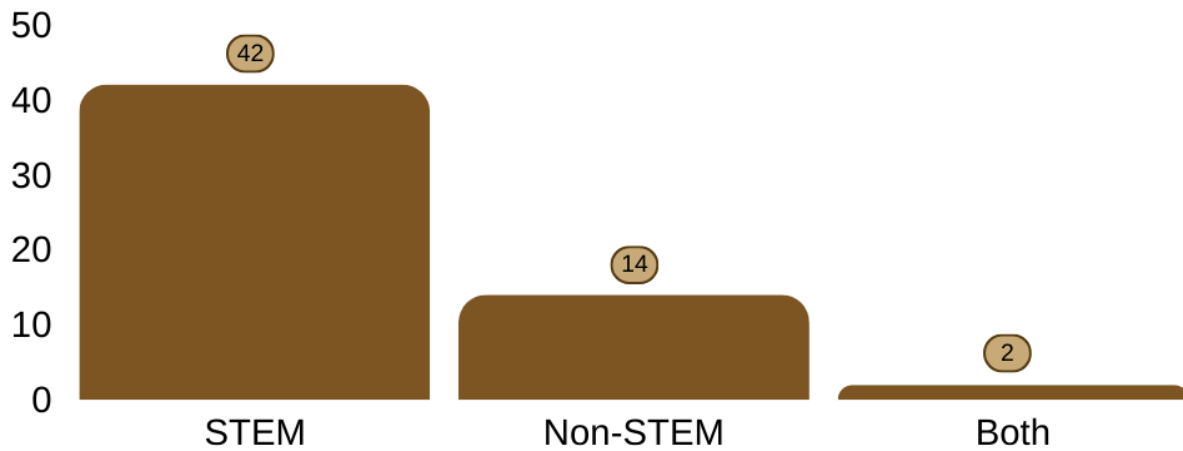


Figure 5

For majors, the majority of respondents selected STEM majors (75.9%, 44/58) including *Physiology* (44.8%, 26/58), *Nursing*, *Biology*, *Molecular and Cellular Biology*, *Chemistry*, *Medicine*, *Nutrition*, and *EMS*. Less selected Non-STEM majors (27.6%, 16/58): *College*

of Humanities, College of Social and Behavioral Sciences and 'Other' if relevant. Two respondents, 3.4% (2/58), indicated both a major that was considered STEM, as well as one that was Non-STEM. Non-STEM majors comprised approximately 25% of the respondents.

**Question 5: How would you describe your usual level of stress?**

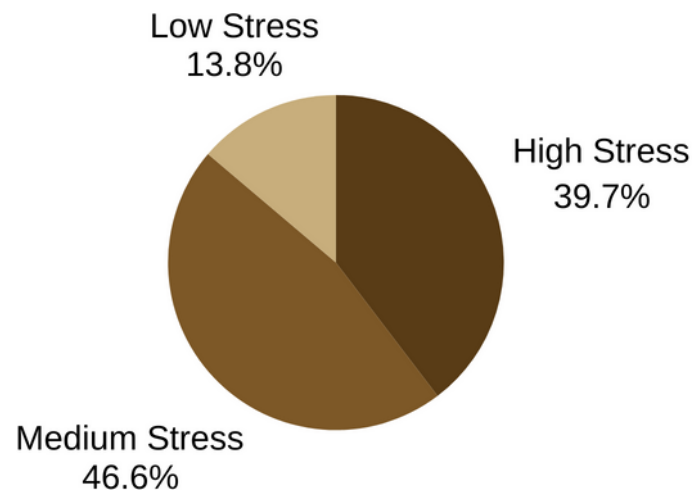


Figure 6

Options of *No Stress*, *Low*, *Medium*, and *High Stress* were provided. No respondents chose *No Stress*. A large percentage of students (~86%) identified that they have either *Medium* or *High Stress*.

**Question 6: How has being a University of Arizona student affected your baseline stress level?**

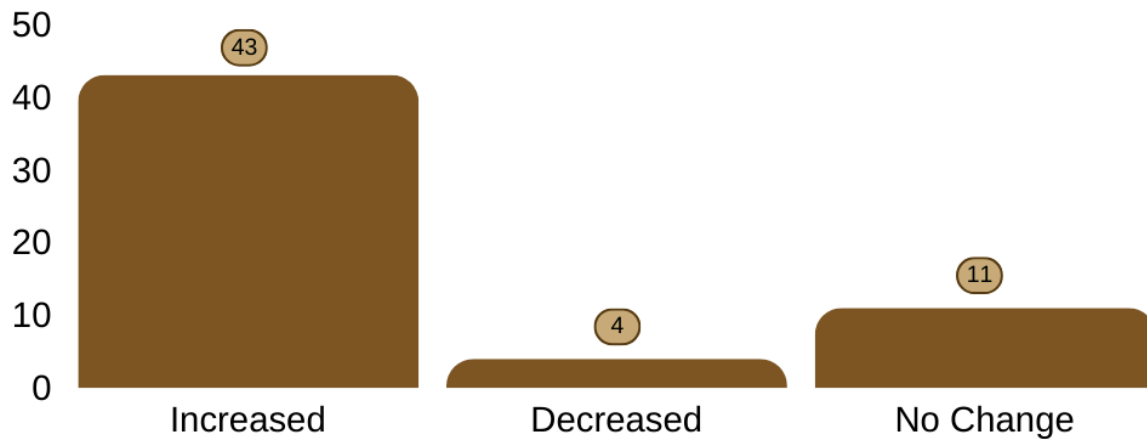


Figure 7

43 participants (74.1%) chose 'increased stress' whereas a decrease in stress over baseling was chosen by only 4 participants (6.9%). No change was chosen by 11 participants (19%). By far the most participants felt that being a student at the university level has increased their stress levels.

**Question 7: Considering your daily levels of stress, which of the following are the most impactful? (Check all that apply)**

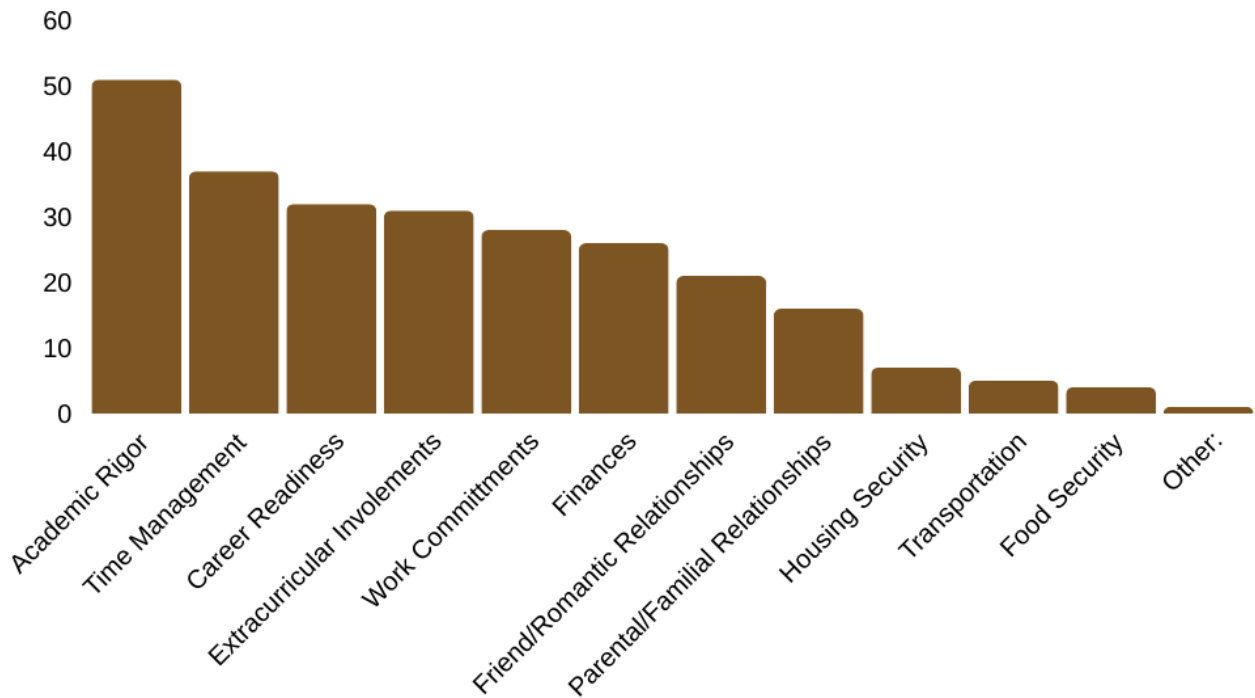


Figure 8

In this initial question regarding daily stress, multiple options were offered for participants to select as stressors, and they were able to choose as many as they felt applied to them.



**Question 8: Which one factor is the most impactful to your stress?**

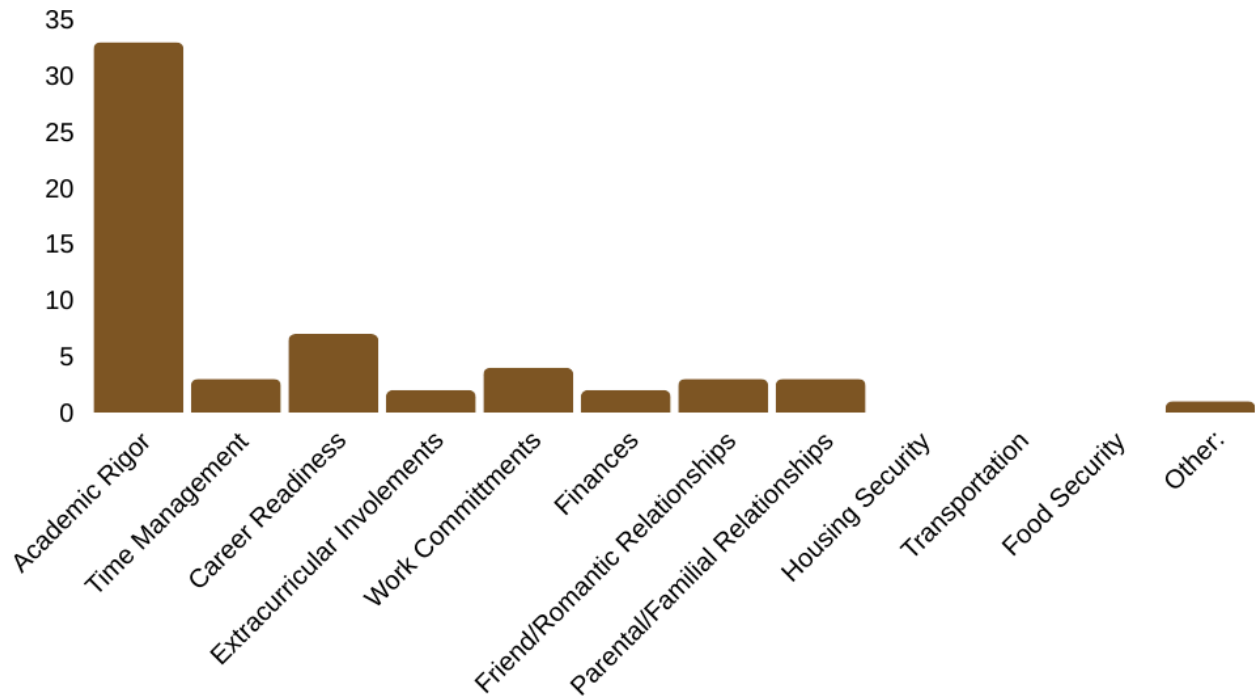


Figure 9

This follow-up question targeted the number one stressor, restricting participants to one choice from the list. The top 4 chosen options seen in Question 8 above can be grouped into the category of “Academic and Career Readiness”. This category was dominated by selection of the *Academic Rigor* option with 50/58 (86.2%) of the participants choosing that as the most impactful factor on their stress.

**Question 9: Focusing on your activities outside of schoolwork, which of the following increase your stress level?**

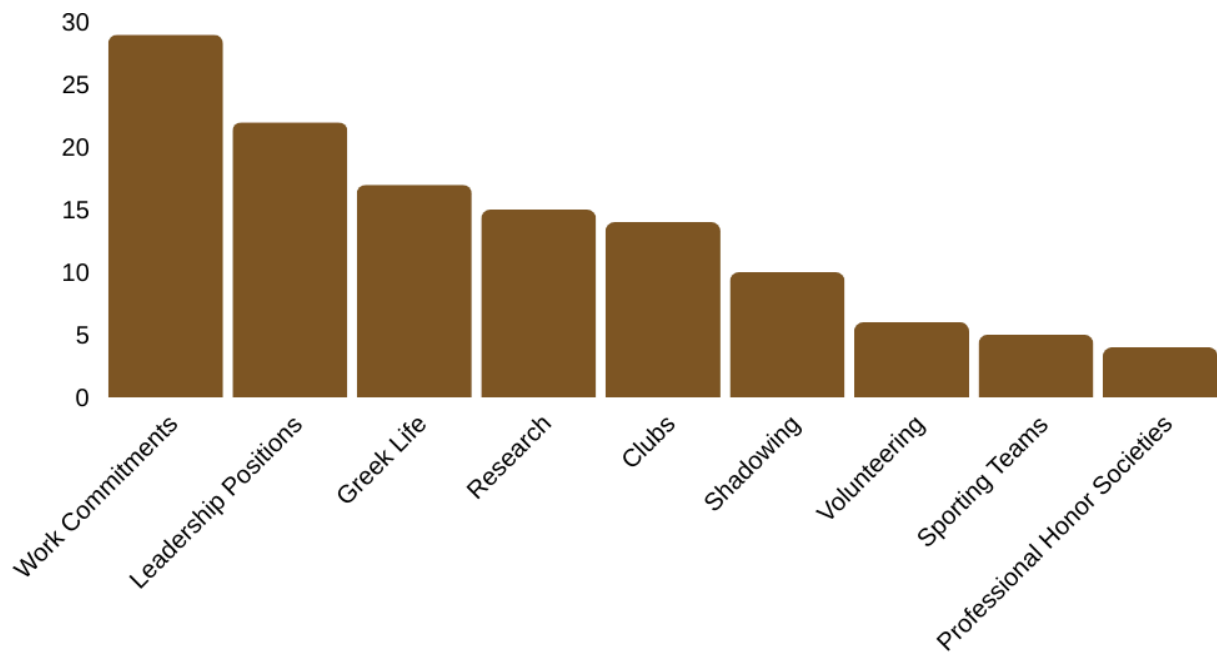
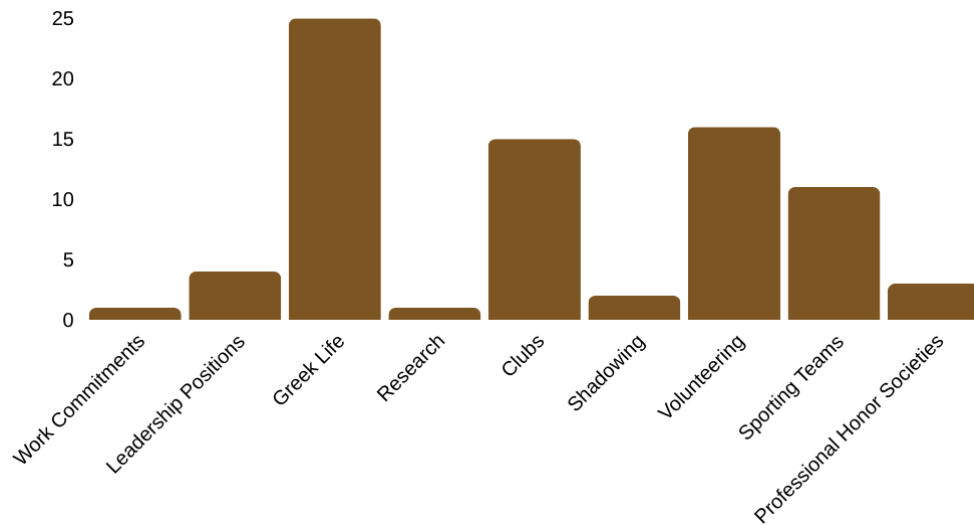


Figure 10

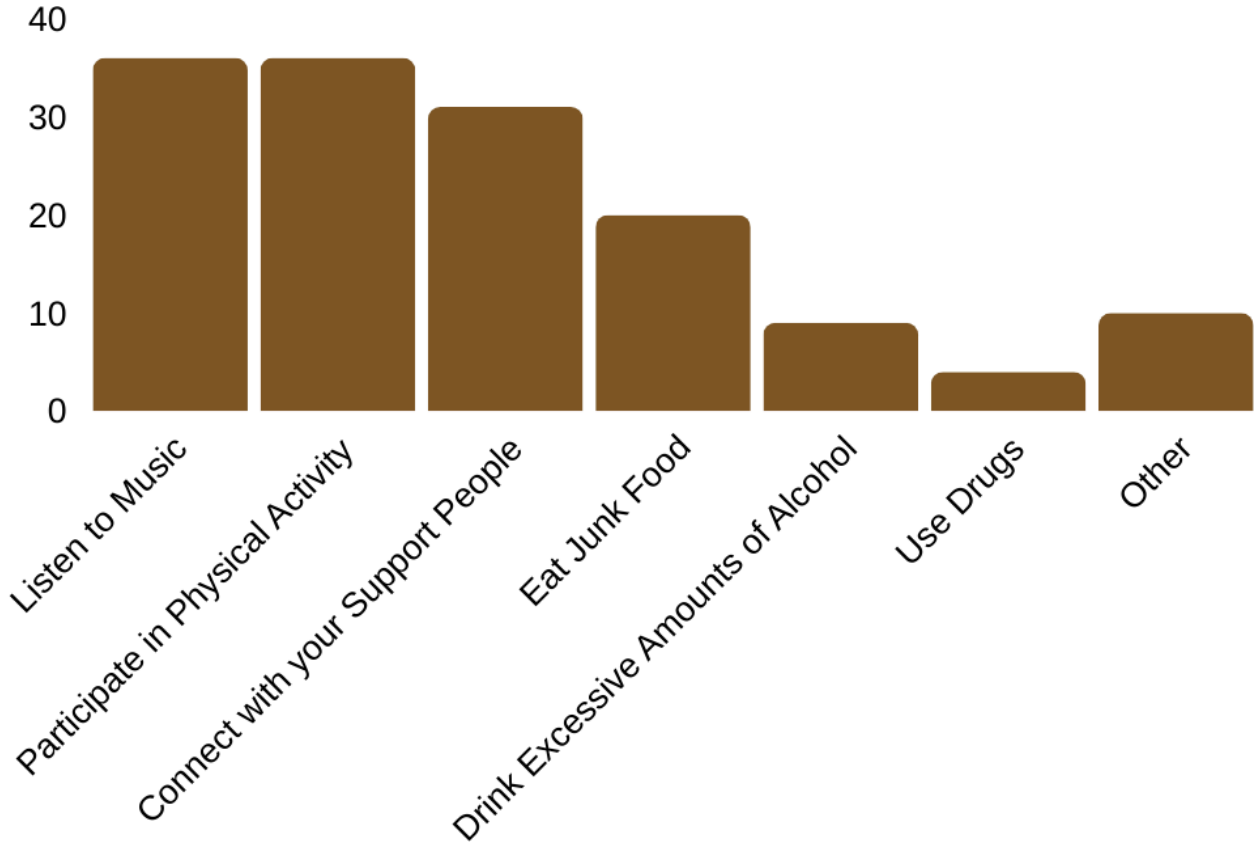
For non-academic or outside of class activities that induce stress, the top choice was work commitments with leadership positions as a close second.

**Question 10: Focusing on your activities outside of schoolwork, which of the following decrease your stress level?**



For activities focused outside of academics or the classroom, while participation in sororities or fraternities was the top choice, several other options were frequently chosen (*Clubs, Volunteering, and Sporting Teams*).

**Question 11: When you are stressed, what do you turn to?**



Multiple selections were allowed on this question. The top 3 choices included *Listen to Music* 36/58 (62.1%), *Participate in Physical Activity* 36/58 (62.1%), and *Connect with your support people* 31/58 (53.4%). Other selections that were less healthy included *Eat junk food* 20/58 (34.4%), *Drink excessive amounts of alcohol* 9/58 (15.5%).

Finally, 10/58 (17.2%) of the respondents selected “Other”. Of these there were several themes: entertainment, such as tv, social media, and video games, dog related (‘*My dog*’), and self-care: (‘*Take a shower!*’ & ‘*Go to therapy*’).

**Question 12: Please provide a brief explanation of why you chose the answer above.**

To provide further insight about the choice on Question #12, a short explanation was requested. Below are some examples of responses.

- Participant Chose: Eat junk food, Listen to music, Participate in physical activity
  - *“I like to eat sweets when I am stressed out, helps me feel better.”*
- Participant Chose: Connect with your support people, Listen to music
  - *“I like music and talking to people more than drinking”*
- Participant Chose: Connect with your support people
  - *“I try to stick to healthy ways to manage stress because things like alcohol and drugs can make anxiety worse”*
- Participant Chose: Eat junk food, Connect with your support people, Listen to music
  - *“Being able to talk and connect with others is one of my biggest de-stress strategies. I also find myself “rewarding” stressful days with junk food”*

**Question 13: In the past week, have you felt?**

For this question, multiple words were offered, indicating feelings that associated with stress and negative mental health, or with positive aspects such as those connected to physical activity and academic focus. Respondents chose from: *Never, Rarely, Sometimes, Very often, and Consistently.*

**Question 13a: Inadequate**

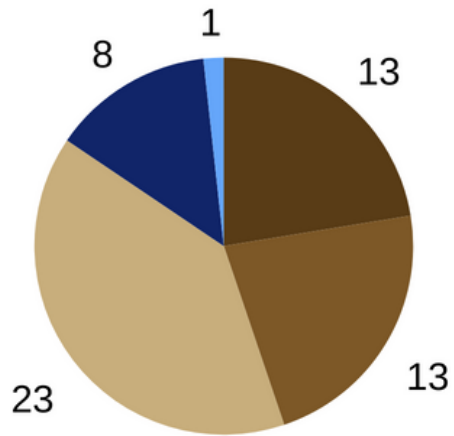


Figure 11

**Question 13b: Overextended**

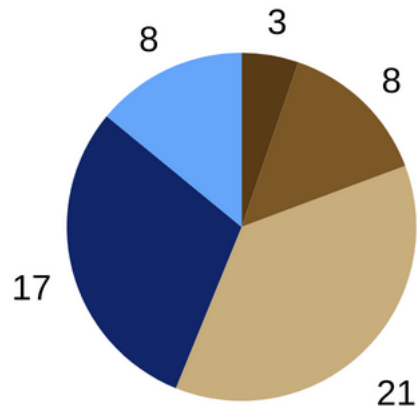


Figure 12

**Question 13c: Swamped by Your Responsibilities**

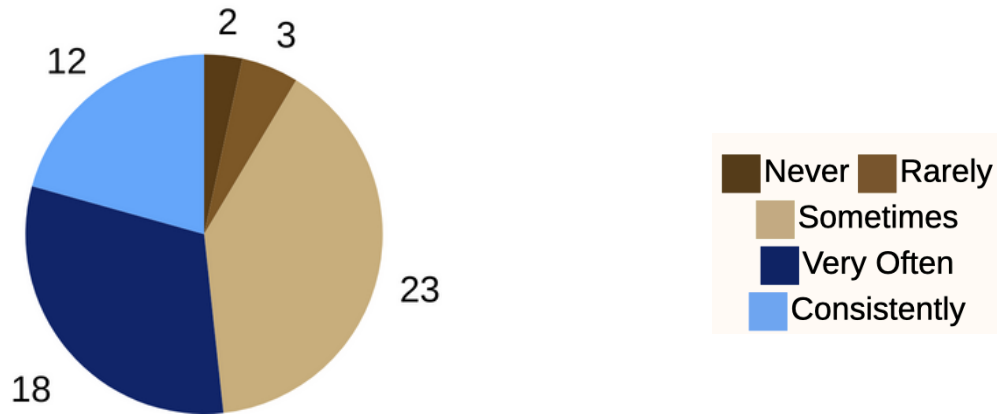


Figure 13

**Question 13d: Like You Couldn't Cope**

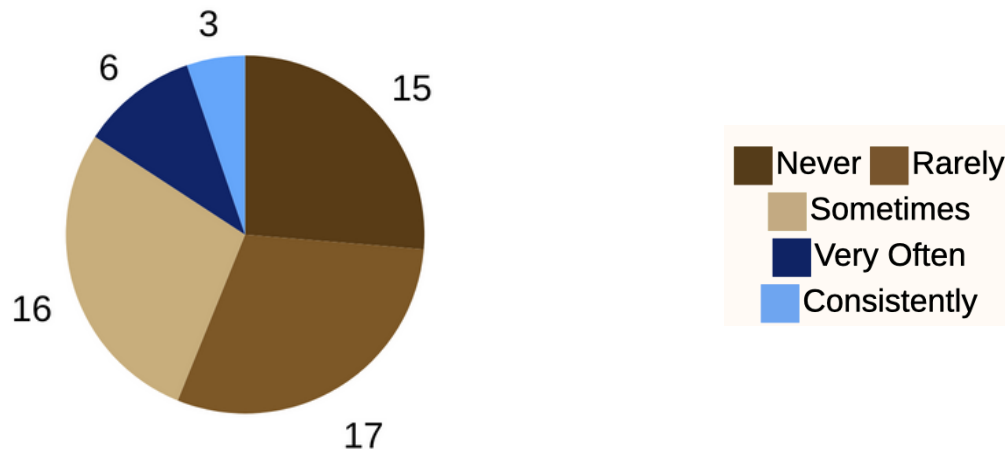


Figure 14

**Question 13e: Physically Active**

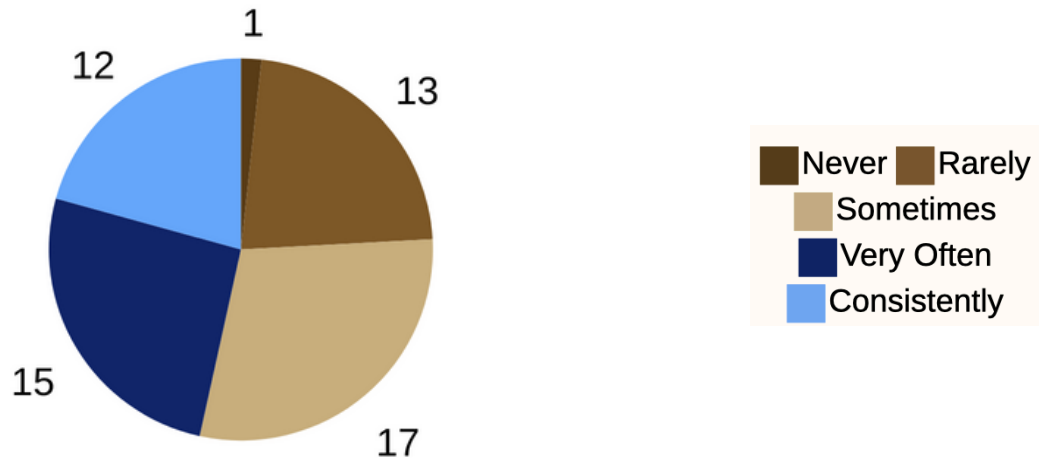


Figure 15

**Question 13f: Academically Focused**

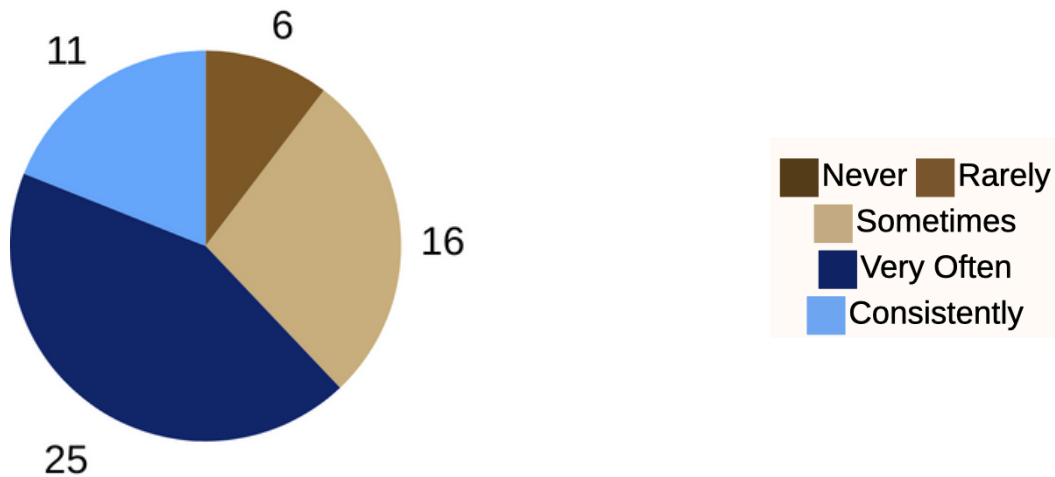


Figure 16

The responses given throughout Question #13 suggest that a majority of respondents feel overextended and swamped, indicating stress and further negative effects resulting from it. At least half of the respondents also use physical activity and are able to be



academically focused, showing positive signs of stress management that do not necessarily lead to responses for 'Like you Couldn't Cope'.

**Question 14: How successful do you think you are in your education?**

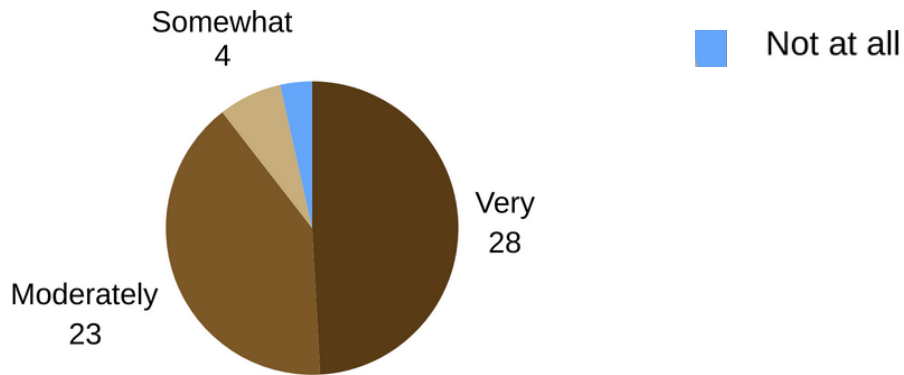


Figure 17

Most respondents think that they are at least moderately, if not very successful in their education.

**Question 15: Do you feel like you have support from university resources? (i.e. Think Tank, SI, SALT Center, DRC, Campus Health and CAPS, etc.)**

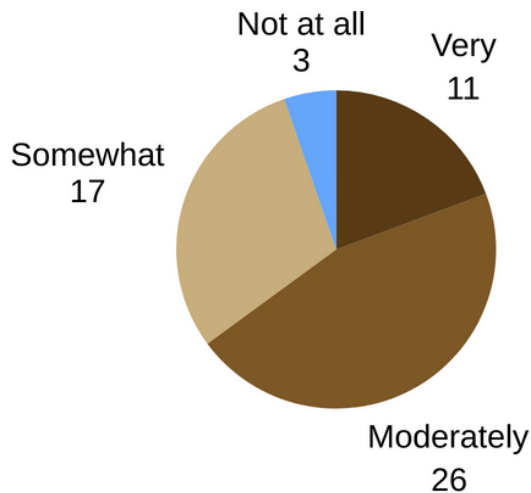


Figure 18

Most students (37/58) responded that they felt that they felt moderately or very supported by university resources.

**Question 16: Do you feel like you have support from departmental resources? (i.e. Office Hours, Preceptors/Group Leaders, Academic Advisors, Administrative Staff Support, etc.)**

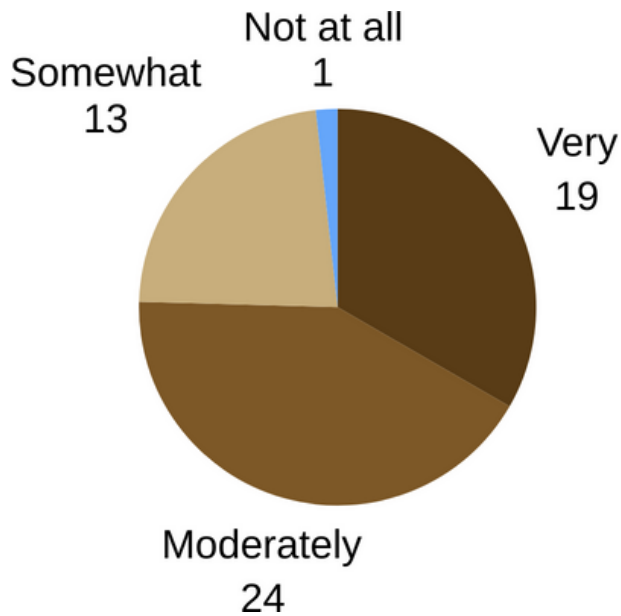


Figure 19

Most respondents felt *moderately* supported by departmental resources, but more people felt *very* supported (19/58) by departmental resources in comparison to university ones.

**Question 17: Of the following, which have been the most helpful to you?**

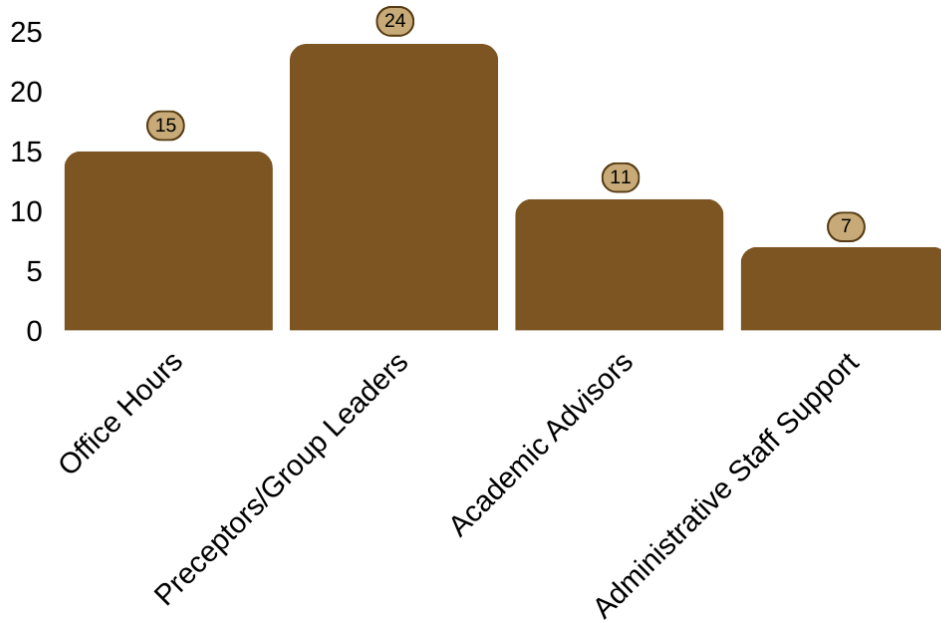


Figure 20

Of the various support options provided by the student's department, responses indicate that preceptors and group leaders have been the most helpful resources.

**Question 18: Do you feel like you have a support system of people to help you handle stress?**

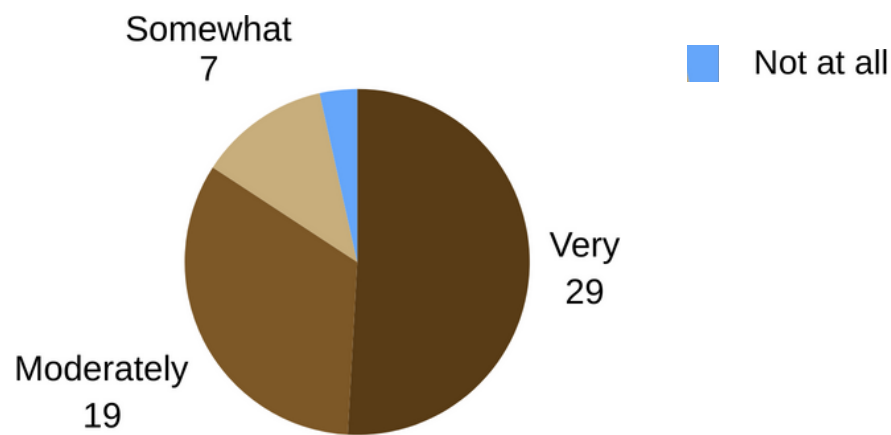


Figure 21

These results confirm that students generally feel like they have a support system to help them handle stress (48/58).

**Question 19: What kind of support do you use when you are stressed? (Check all that apply)**

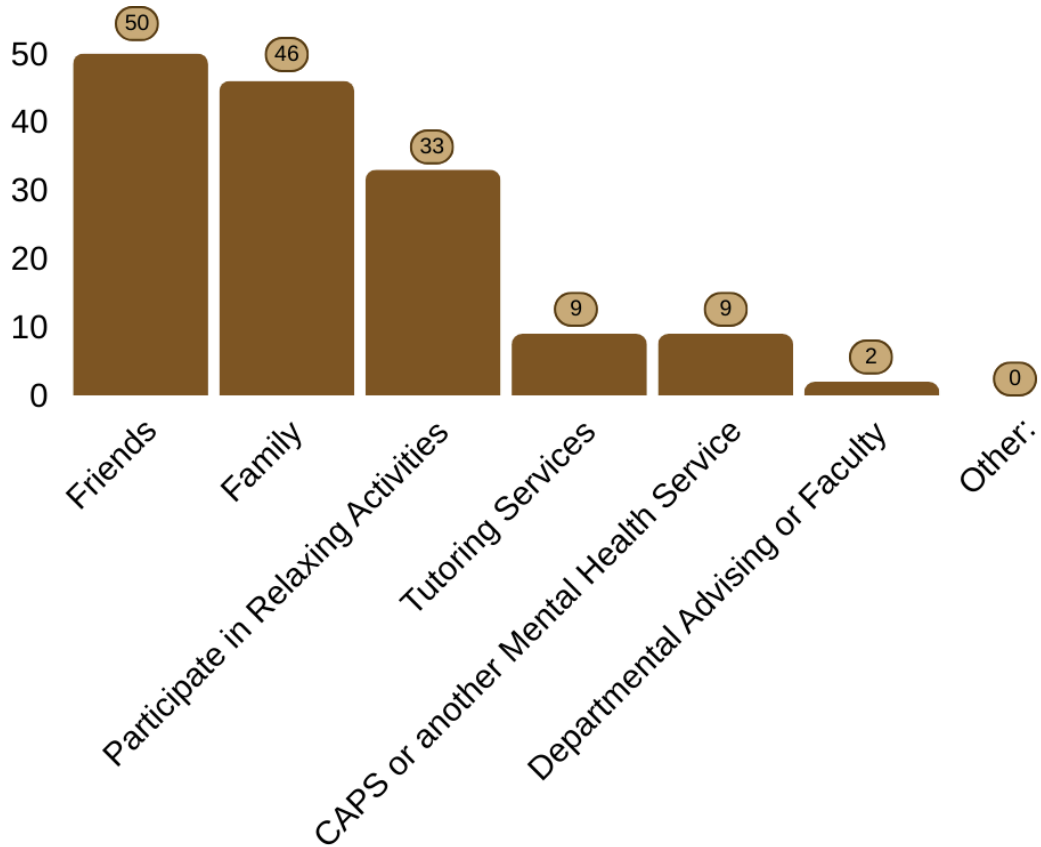


Figure 22

For this multiple-select question, responses indicate that most students use friends, family, and relaxing activities as support for managing their stress.

**Question 20: Which relaxing activities do you choose to engage in for stress relief?**

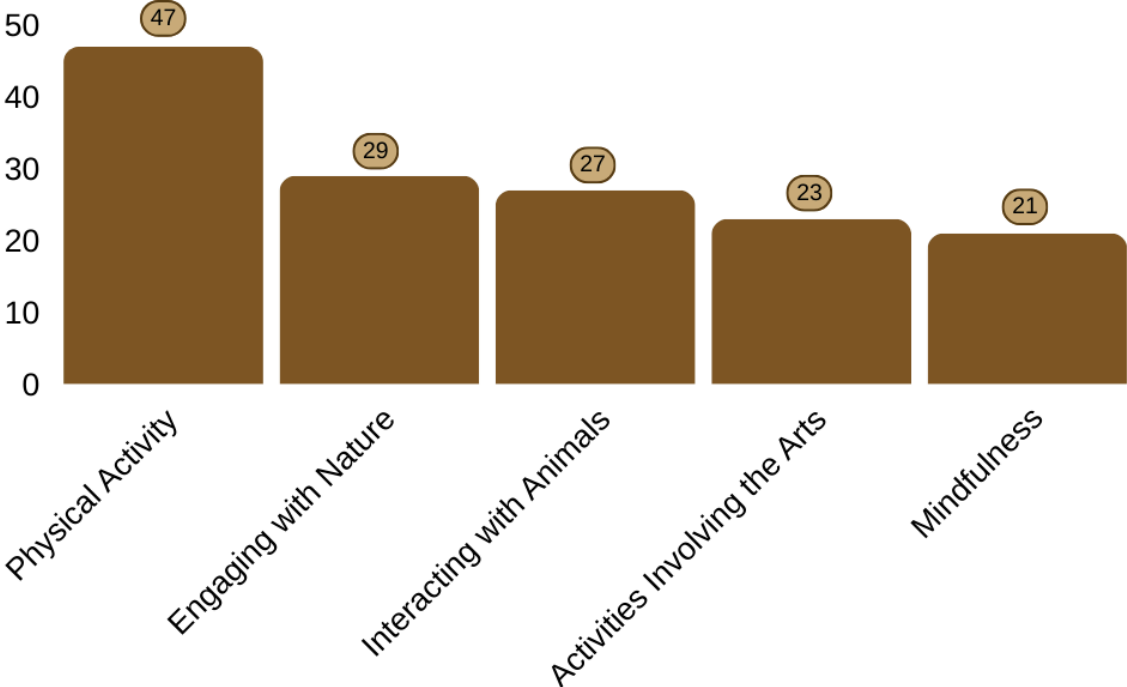


Figure 23

For this multi-selection question most people chose physical activity as a way to engage in stress relief. However, almost half of the respondents chose to include *Engaging with nature* or *Interacting with animals* as methods for stress relief.

**Question 21: There are therapy dogs that visit campus during finals and other times. Would you go to visit these animals?**

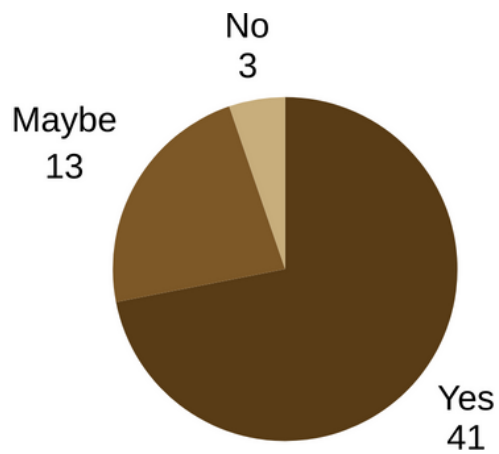


Figure 24

A resounding 70% of respondents indicated that they would visit animals on campus.

**Question 22: Do you believe that an interaction with a dog would improve your stress levels?**

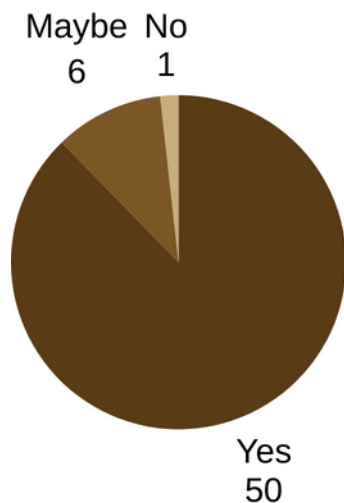


Figure 25

The majority of respondents believe that dog interaction would improve their stress level.

**Question 23: Have you attended any campus events meant for stress relief? If so, which one(s).**

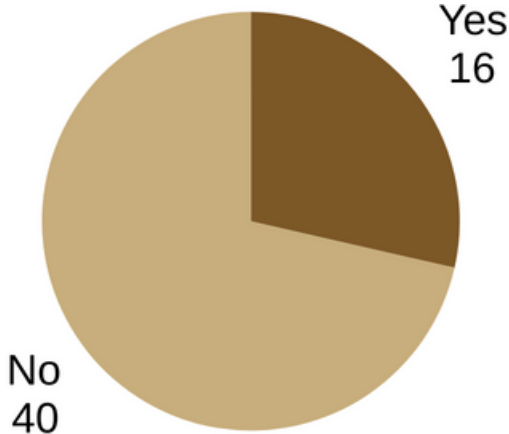


Figure 26

Only 27% of respondents had taken advantage of the campus events meant for stress relief.

**Question 24: If yes, did this or these events improve your stress levels?**

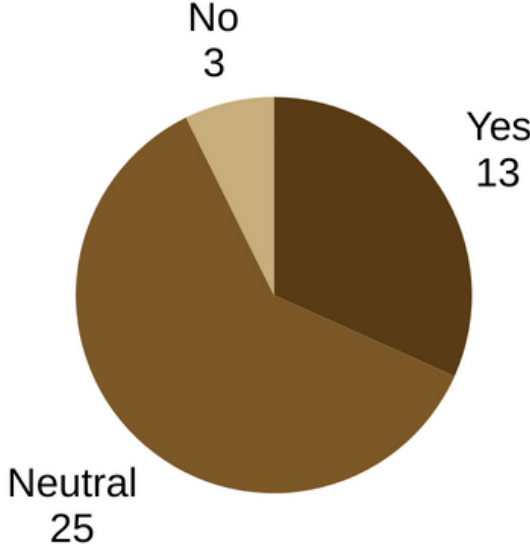


Figure 27

Based on Question #23, only 16 people attended stress relief activities. Of those, most (13/16) people who attended campus events for stress relief said that they felt improved stress levels. The 25 'Neutral' replies were from respondents who did not attend these events.

**Question 25: What is your experience with dogs during your time as a UofA student?**

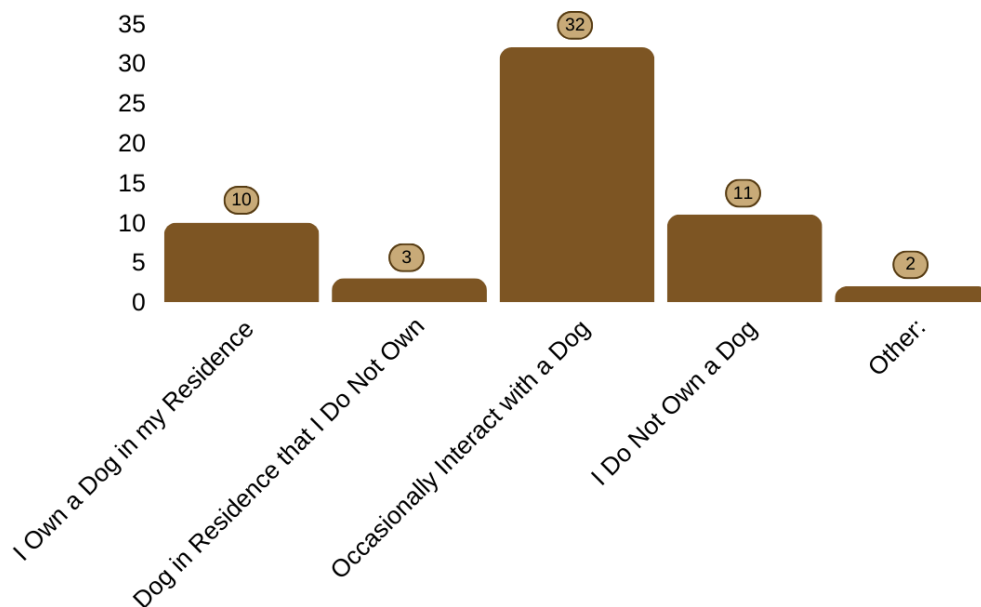


Figure 28

Most people who responded expressed that they occasionally interact with a dog and 13/58 (22.4%) people have a dog in their residence, 10/58 (17.2%) of which are the owners of the dogs. The 'Other' responses included "We have a family dog back home in Okinawa" and "My boyfriend owns a dog that I tend to see almost every day".



**Question 26: Are you the main caretaker of the dog?**

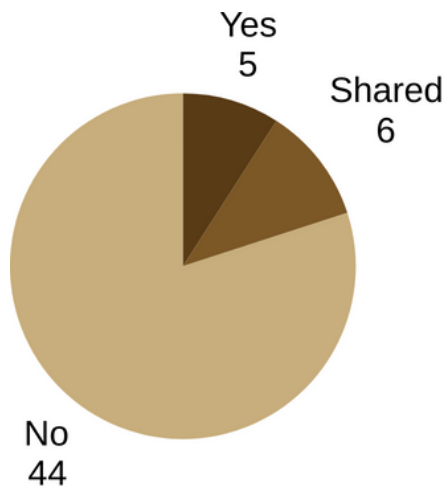


Figure 29

Most people who responded are not the main caretakers of a dog. However, 11/58 (19%) of people have some responsibility for a dog, whether it is shared responsibility or they are the main caretaker.

**Question 27: Do you believe that having a dog improves your sense of well-being?**

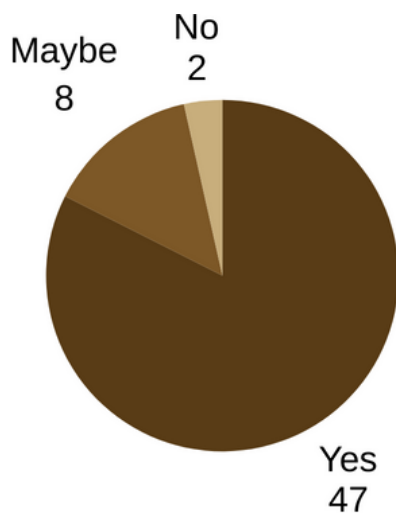


Figure 30

A large majority of respondents (81%) believe that having a dog would improve people's well-being.

**Question 28: Do you regularly interact with a dog?**

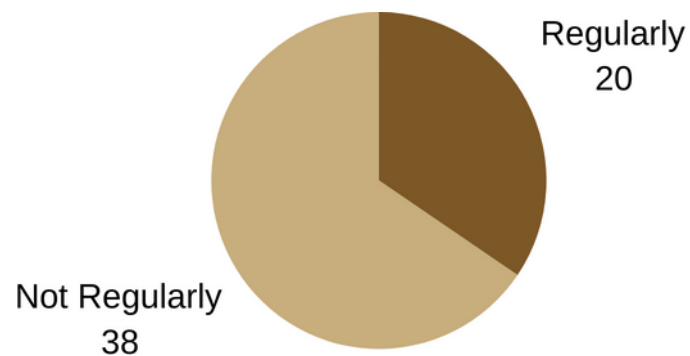


Figure 31

Given choices to indicate frequency of interacting with a dog, 12/58 (20.7%) people answered "Yes, more than once a week", 8/58 (13.8%) people answered "Once a week", 18/58 (31%) people answered "Once a month", and 20/58 (34.5%) people answered, "Less frequently than once a month". For the graph above, these choices were grouped into regularly (*Once a week or More than once a week*) or not regularly (*Less than once a month or Not at all*) showing that most of the respondents do not interact with a dog regularly.

**Question 29: Do you have interaction with any animals regularly? (Cat, bunny, goat)**

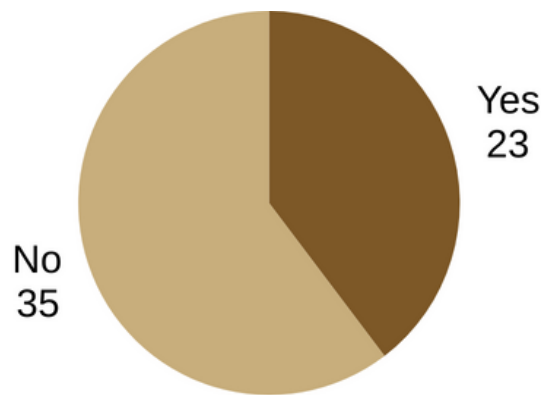


Figure 32

Most respondents do not interact with any animals regularly.

**Question 30: Do you have a bond with any kind of animal?**

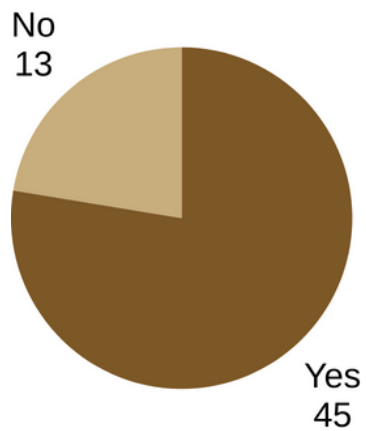


Figure 33

Most people answered that they have a bond with an animal, indicating that this is likely valued.

**Question 30a: If so, what animal(s)?**

This was a short answer question, responses included “*My family dogs at home, I see them maybe once a month*”, “*Dog, horse*”, “*my dogs and guinea pig at home*”, “*cats*”, and “*Pet rat*”. Most of these animals are considered companion animals and therefore have the opportunity to support people emotionally.

**Question 31: After interacting with a dog, do you feel like your stress level has improved?**

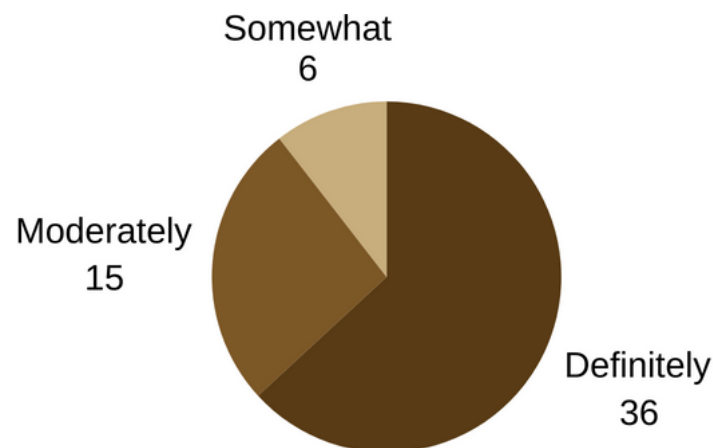


Figure 34

Most responses indicate that interacting with a dog causes a feeling of improvement for a student's stress level.

**Question 32: Does the resulting decreased stress have a positive effect on your success as a student?**

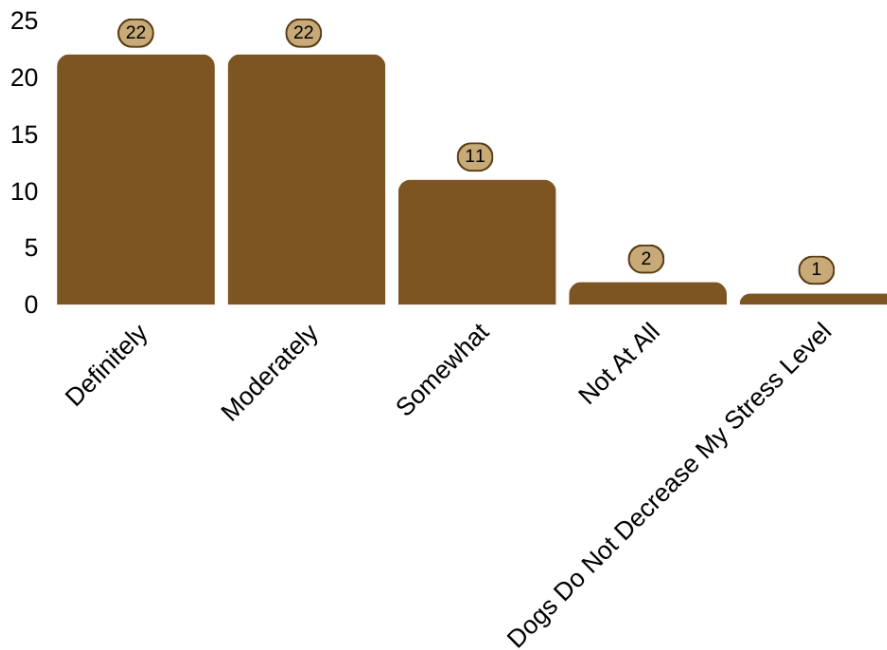


Figure 35

Most responses (44/58, 76%) indicate that students believe that decreased stress from interacting with a dog will have a positive effect on their success.

### Free Response Section

The last section allowed opportunities for free response.

**Question 33: How have your experiences been with animals historically? (Include experiences in your youth, teenage years, and years in college) And how has that affected your responses above?**

- “I've had dogs since age 12 and I love caring and taking care of them. My experiences with them have been generally positive and I have missed animals since going off to college. This led to me getting a cat who I love dearly.”
  
- “Not much. Never owned a dog”
  
- “I have had very positive experiences with animals and have always seen them as stress relief.”
  
- “In my youth I just enjoyed having a pet, in my teenage years my cat would sit on my lap while I did homework or anytime I was stressed he would lick my tears (ik it's a cat he was unique 😊) and in my college years having a pet(through my bf) and having him sit on my lap while I do homework or when I need a break I play with him it's an amazing distracting and good way to relieve stress”
  
- “My family has always owned dogs and I currently have 3 that drastically benefit my stress levels and I wish I could see them more but my family does not live in Tucson so I don't get to see them often.”
  
- “I am not a very big dog person - they are smelly and slobbery, which is why I like cats more, but dogs can still obviously be very cute and sweet.”

# DISCUSSION

The survey data has revealed some interesting findings regarding student stress, key factors that induce stress, and methods that students prefer for stress management. In addition, several trends correlating gender, stress levels, and interactions with animals were identified.

Looking first at levels of stress in the context of academic class status, there are some intriguing correlations. The class with the highest percentage of *High* stress chosen was Freshman (50%) and one respondent chose Other who is Fifth Year (100%). For the Sophomores, Juniors and Seniors, *Medium* was the most common answer choice. These statistics indicate a potential that Freshman may not know how to manage their stress well yet, resulting in choosing *High* as their usual stress level. It would be interesting in future surveys to delve deeper and ask if their stress has changed throughout their college career, and whether it was due to academic rigor differences, better stress management strategies (for example more support people, better time management, getting a dog, etc.), or other factors.

One of the Freshman, who is a Psychology major, responded that they had *High* stress and chose *Academic Rigor* as the single most impactful factor for their stress, and on the multiple select they only added *Parental/Familial Relationships* as an answer choice. This student indicated that they use *Friends, Family, CAPS or another Mental Health Service, and Participating in relaxing activities* as support during stressful times. In a later answer, this person explained that they deal with anxiety and have had animal support, including a dog and guinea pig, since they were very young, but do not have

any close interaction with any animals while they have been in college which has been difficult for them. They also added that “Seeing animals makes me happy and I miss them here when I feel stressed”. A second Freshman, a Biology major, chose *High* stress and also chose *Academic Rigor* as the factor most impactful to their stress. This student also noted that they feel *Moderately* successful in their education, they also feel *Consistently* academically focused, and that “Dogs absolutely help with stress!”. Together, these responses show support for the hypothesis that dogs help relieve student stress and could contribute to academic success. When looking at these results, it would have been helpful to have the respondents indicate which “residence” they were referring to. Likely, some people indicated that they have a dog in their place of residence, referring to a home that is not in Tucson, and therefore they do not interact with the dog regularly.

For the Fifth Year student, a *High* stress level was indicated. This respondent chose *Academic Rigor* as the most impactful factor for their stress, however, they selected all of the options given for things that impact stress, except for *Extracurricular Involvements*. These answers are consistent with the responses to questions about stress management that indicate that this person participates in less healthy activities in response to stress.

When comparing levels of stress, it is also interesting to look at the connection between that and majors. The majors were grouped in two categories, Non-STEM (including *College of Humanities, College of Social and Behavioral Sciences, and Other*) and STEM (*Physiology, Biology, Chemistry, EMS, Nursing, Medicine, Molecular and Cellular Biology, and Nutrition*). There were 2 people who selected multiple majors



that included both a STEM and Non-STEM major, and were included in the STEM major group. The Non-STEM group included 7/20 (35%) respondents that said *High* stress level, while the STEM group included 16/38 (42.1%) respondents that said *High* stress level. More specifically, 11 out of the 16 STEM majors who chose *High* stress were Physiology majors. These results indicate that STEM majors, as well as Physiology majors, are more likely to have *High* stress levels. One could assume that increased stress is due to the increased academic demands and expectations for involvement in extracurricular activities to increase potential for admission to professional post-graduate programs.

Looking at the connections between gender and de-stressors, females chose art-related activities, nature engagement, and interacting with animals proportionally more than males did. Males chose physical activity more often than females did. A total of 93.8% of the males (15/16) and 79.5% of females (31/39) included physical activity as one of the ways that they engage in stress relief, making it the most popular option. Interacting with animals was chosen by 49.1% of respondents (27 out of the 55 who answered this question), showing that about half of the population, both males (31.3% of them) and females (56.4% of them), will choose animals as a way to relieve stress.

Another key piece of information that the survey questioned is whether students believe that dogs are an effective way to reduce stress. When asked if they believe that interacting with a dog would reduce their stress, 87.7% of the respondents answered *Yes*. Only one person responded with a *No*, that was a student who *occasionally* interacts with dogs, while another small number the other (6/58, 10.5%) responded

*Maybe*. These responses support that students believe that dogs would reduce their stress levels.

It was predicted that most students would have this belief, leading to the question of whether students would or did actually participate in dog events on campus. In the results, 71.9% of students indicated that they would visit therapy dogs on campus, yet only 28.6% had attended any campus event meant for stress relief (including dog events and others). For those who had attended stress relief events on campus 81.25% responded that they improved their stress levels. With all of this, students wrote "*Please get more dogs on campus*" and "*I tend to have higher stress levels and I have been thinking about seeing the dogs on campus but haven't*", both of these indicating that dog events on campus need to be better advertised, and potentially more welcoming and easier to access. Efforts could be made to improve this by ensuring that staff and advisors know about the resources available for students to manage stress, such as therapy dog visits, and informing their students through increased social media presence for these groups and events. Advertising these events at a departmental level seems like it would be more effective due to student responses to Questions #15 and #16 indicating that more students feel *Very* supported from departmental resources (19/57, 33.3%) than they do from university resources (11/57, 19.3%).

Reflecting on the modes of advertisement for this survey, it seems that the results are indicative of specific groups with similar characteristics. With half of the respondents being Physiology and Medical Sciences majors, it might be assumed that these students have less time outside of school and other involvements to own a dog or interact with animals. Also, the stressors of students in this major are often related to

their focus on pursuing a graduate or professional degree, whether it is a Medical Doctor, Physicians Assistant, Physical Therapist, Dentist, a Master's degree with a research focus, or others. There is considerable stress that comes with preparation for these post-baccalaureate programs. There is also a consideration that the Greek life population was likely a large part of the survey responses, therefore, stressors such as food and housing insecurity are less likely to be chosen. This is due to the monetary demands of being a part of a Greek organization (sorority or fraternity) indicating that the student has the funds for food and housing, as well as the opportunity for more affordable housing in chapter facilities.

Another factor that indicates that the our survey respondent population could be less representative of the whole population of students is the small sample size. A sample of 58 students from a population of over 50,000 students is very small, yet the conclusions made still came from a somewhat diverse group in terms of gender identification, age, academic class status, and major type (STEM and Non-STEM). With a wider net of participants for our survey, the results related to these factors may have been different, including the idea that some students are afraid of dogs and were less likely to take the survey. In the future, asking about this fear more directly would provide more contextual information for the results.

An important limitation of this study is that we were unable to measure academic success objectively. Although we asked about student's feelings about their academic success, it was not possible to collect the grades of our respondents to along with their subjective answers due to privacy issues. If grades were collected, there would be more

potential for a stronger correlation between interaction with dogs as a method for stress relief and academic performance.

The most popular method to reduce stress was exercise, but interaction with dogs also seemed reasonable. Using exercise as a method of stress management is a very common choice for students, however, it takes planning and a decent amount of time out of their day to do this successfully. Opting for a visit with dogs on campus has the opportunity to be a more efficient stress reliever because they can gain benefits from just 30 minutes of dog interaction, and there is no preparation or aftermath clean-up needed besides maybe a hand wash.

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