PAUSE WITH PAWS: IMPLEMENTATION OF AN ANIMAL VISITATION STRESS REDUCTION PROGRAM AT A SMALL VERMONT COLLEGE

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Abstract

This evidence-based practice change pilot project explored college student perceptions of the efficacy of an animal visitation program (AVP) toward reducing perceived stress. Using a quantitative, longitudinal pre- and post-intervention design, a convenience sample of students from a Vermont college were recruited to attend seven-weekly, 90-minute AVP meetings where they interacted with dogs in a casual environment, while practicing mindfulness techniques. Participants completed the Perceived Stress Survey (PSS-10) pre-, intra-, and post-intervention to measure student perceived stress; and the Center for the Study of Animal Wellness Pet Bonding Scale – adapted (CSAWPBS) intra-and post-intervention to measure perceived attachment to the dogs. A one-way analysis of variance (ANOVA) showed a significant difference between measures on the PSS-10 ($P = 0.02$) indicating that student perceived stress decreased significantly over time. The CSAWPBS increased slightly; yet showed no significant difference between intra-and post-measures, thus, suggesting that while interactions with the dogs did increase positive emotions over time, students experienced limited attachment to the dogs. These findings suggest that an AVP program may be an effective intervention to reduce perceived stress in college students.

Pause with Paws: Implementation of an Animal Visitation Stress Reduction Program at a Small Vermont College

Stress and puppies are seemingly paradoxical concepts, however, while one might struggle to find the intersection, it is important for the holistic college health nurse to consider the link. According to the American College Health Association (ACHA) college student perceived stress may lead to poor academic outcomes and life dissatisfaction (ACHA, 2016), and research shows human-animal interactions can lower autonomic responses to perceived stress and contribute appreciably to human health and quality of life (Goddard & Gilmer, 2015; Wells, 2009). American college students comprise approximately six percent of the population in the United States (US) or about 19.5 million people (National Center of Education Statistics, 2016). The ACHA (2016) reported that perceived stress contributes to over one-third, or 33.8% of national college student population. This statistic has fueled a vigorous stress reduction crusade throughout US colleges and universities.

The transition to college is a time when students are beginning to make important decisions that may affect their life trajectory. Making these new life decisions may generate more perceived stress for the college student. Key indicators of perceived stress include homesickness, lack of a social support system, parental and personal academic expectations, college and life affordability, work-school-life balance, and pre-existing stressors (Adamle, Riley, & Carlson, 2009; Barker, Barker, McCain, & Schubert, 2016; Bjick, 2013; Peer, Hillman, & Van Hoet, 2015; Thurber & Walton, 2012). The target population for this pilot project was 1,700 full-time and 400 part-time undergraduate students between the ages of 18-24 at a small liberal arts college in rural Vermont. The ACHA (2016) reported that at this college 46.6% of students rated their overall level of stress as *more than average*. This figure suggests that

perceived stress is a significant problem for nearly half of college students at this organization. College health care providers must implement programs to assist student perceptions of stress produced while navigating through challenging new experiences and new found personal independence.

Animal visitation interventions are an alternative/adjunct to traditional medical treatment for perceived stress and have been used in many environments to evoke positive emotions in human beings. The research findings on animal visitation in long-term care facilities, correctional facilities, hospitals, airports, primary care offices, residential group homes, schools, and colleges suggest that animal visitation has beneficial effects on most people in these populations (Cipriani et al., 2013; Johnson, Odendaal, & Meadows, 2002; Schramm, Hediger, & Lang, 2015). Animal visitation programs (AVP) are increasingly prevalent on college campuses in the US. Fine (2015) reports that there are currently 925 AVPs and the number is growing. The literature shows that AVP is thought to have a positive effect on college student perceived stress, mood, and anxiety (Barker et al., 2016). Therefore, AVP may prove to be an effective stress reduction intervention in the college student population.

This article explores the problem of perceived stress in college students and provides a discussion about animal visitation as a holistic intervention to reduce perceived stress in college students. Current knowledge about AVP in the college population is provided. As well, a brief overview of the human-animal bond throughout history and an introduction of the current available knowledge regarding the reciprocal health benefits of such bonding experiences. A description of how the Transactional Model of Stress and Coping was used as rationale to guide the development of an AVP intervention at this college. Additionally, an explanation of the methods used, ethical considerations, limitations of the project, and the results of the

implementation of this evidence-based animal visitation stress reduction program. The specific aim of this program was to encourage college students to learn and use adaptive, holistic coping strategies in response to perceived stress.

Problem Description

The college years may nostalgically be referred to as *the time of one's life*, the truth is that college is a formative developmental experience, particularly for the post-secondary student, and those attending college are typically considered at significant risk to experience the problem of increased perceived stress in response to new demanding social, financial, and academic responsibilities (Adamle et al., 2009; Barker et al., 2016; Bjick, 2013; Peer et al., 2015; Thurber & Walton, 2012). Post-secondary college students present to the college setting having learned, over the course of their youth, how to cope in response to perceived stress through exposure to the behavior of normative referent others in their social milieu. Thus, depending on the particular social milieu, learned stress-coping abilities may be either adaptive or maladaptive.

Adaptive responses are desirable behaviors that are reflective, help seeking, and used by the student to resolve stressful situations (Mahmoud, Staten, Hall, & Lennie, 2012). Maladaptive responses to perceived stress are undesirable behaviors, including but not limited to avoidance, isolation, and substance use (Mahmoud et al., 2012). Ironically such behaviors, while intended to be compensatory and protective against a perceived threat, add to perceived stress and appear to be the root cause of a downward cascade toward poor academic outcomes (Mahmoud et al., 2012). Poor academic outcomes include earning a lower course grade, a lower grade on an exam, obtaining an *incomplete* in a course, or a significant interruption in academic progression (American College Health Association, 2016).

Maladaptive responses to perceived stress are also responsible for some physiological and psychological health concerns (Mahmoud et al., 2012). Stress initiates the sympathetic and parasympathetic nervous system, that is, the fight or flight response. According to Selye's General Adaptation Syndrome, prolonged exposure to perceived stress decreases immune function, increases fatigue, and increases risk factors for the development of depression and anxiety (Goddard & Gilmer, 2015; Wells, 2009). Two key risk factors for perceived stress in the college student population are stressful life circumstances and school/community factors (Suicide Prevention Resource, 2014). Although separate, these two risk factors are often intertwined and have an interactive effect for most college students.

The Anxiety and Depression Association of America (2010) estimates that 40 million Americans suffer from perceived stress-induced anxiety, one-third of which have a first episode by age 22. The immediate post-secondary period between adolescence and early adulthood is a significant period of developmental transition as it marks the transition from relative dependence or interdependence to relative interdependence or dependence, most significantly manifested by living at home to living at college. It is a time when a person is learning to adjust and adapt to the separation from parents, family, friends, pets, normative behaviors, and usual routines (Thurber & Walton, 2012). Developmentally, people age 18-24 are in the emerging adulthood stage which requires them to draw on old, and develop new, coping and life management skills (Mahmoud et al., 2012). If the person fails to develop adaptive responses to perceived or actual stress i.e. seeking support, finding solutions, and acting to resolve issues, maladaptive responses and life dissatisfaction may result (Mahmoud et al., 2012).

College health care providers continue to take a proactive stance against student perceived stress. According to Holland and Wheeler (2016), students that employ maladaptive

behaviors are often the students that avoid seeking help due to the stigma of stress reduction services. Stigma is a social determinant that carries a stain of imperfection, which affects student help seeking behaviors (Holland & Wheeler, 2016). Research data suggest that students who engage in social activities are more likely to be successful in college (Conley, Travers, & Bryant, 2013). Therefore, colleges must implement social programs that are appropriate, affordable, accessible, and acceptable to college students for such programs to reach full potential.

Available Knowledge

A comprehensive literature review was conducted to answer the following clinical question: In college students, how does the implementation of a consistent AVP as part of wellness activities affect student perceived stress pre-, intra- and post-intervention within a three-month period? An electronic search of the digital databases available through Capella University's online library was conducted to explore how implementation of a consistent AVP, as part of wellness activities, affected college student's perceived stress over time. Databases were queried using identified search terms and inclusion and exclusion criteria to identify the relevant primary research. Databases, including the Cumulative Index to Nursing and Allied Health (CINAHL), Elton B. Stephens Company (EBSCO), OVID, Medline (PubMed), Academic Search Premier, SocINDEX, and PsycArticles, were searched using the following terms: *stress* and *university students, perceived stress* and *college campuses, animal visitation programs* and *college campuses, stress* and *college students, animal-assisted therapy, animal-assisted interactions, animal visitation programs, animal-assisted therapy* and *college students, depression, anxiety, and stress* and *college students, homesickness* and *college students, animal human bond, animal effect on human health, mindfulness activities, and animal-assisted therapy* and *nursing*. Only those articles that appeared in English and in full text published between

2000 and 2016 were included. Articles lacking scientific merit and clinical relevance were excluded. The initial search yielded approximately 1,260 articles. Abstracts and titles were then reviewed for their relevance in relation to the above stated question. Thirty-three articles or books were retained based on relevance to this project.

Historically, human-animal interaction dates back as far as prehistoric time as evidenced by archeological cave drawings of humans and animals sitting around campfires (Connor & Miller, 2000). There is also evidence of ancient skeletal remains of a human curled up in fetal position as if protecting or hugging a dog (Beck & Katcher, 2003; Connor & Miller, 2000). The writings of Florence Nightingale suggest the use of pets as a recognized form of comfort or treatment in the health care setting in the 19th century (Beck & Katcher, 2003; Morrison, 2007). In fact, there are many health benefits to human-animal interaction such as increased social interaction, improved mood, lowered autonomic responses to stress, reduced feelings of loneliness, increased self-esteem, and extended life expectancy (Goddard & Gilmer, 2015; Wells, 2009). Animals have a prophylactic and therapeutic value for humans, and pet ownership tends to increase an individual's motivation to attend activities where animals will be present as the interaction has contributed appreciably to feelings of an improved quality of life (Goddard & Gilmer, 2015; Wells, 2009).

The transition to college is a time when students are beginning to make their own medical decisions. Findings suggest that during this transitional period students need guidance from college health care professionals to understand when to seek treatment and where to get treated (Adamle et al., 2009; Barker et al., 2016; Bjick, 2013; Peer et al., 2015; Thurber & Walton, 2012). A students' perceived stress during this period may have both positive and negative effects on their lives based on individual perceptions of stressful events (Ming-hui & Yang,

2016; Peer et al., 2015; Thurber &Walton, 2012). Findings suggest that those students who perceive stress as positive felt that stress motivated them to complete tasks and move on with the next task (Ming-hui & Yang, 2016; Peer et al., 2015; Thurber &Walton, 2012). Whereas, those who perceived stress as negative felt that stress made them irritable, depressed, hopeless, anxious, and unable to concentrate (Ming-hui & Yang, 2016; Peer et al., 2015; Thurber &Walton, 2012). Among those students who perceive stress as negative some may also exhibit physical effects such as increased heart rate, tremors, gastrointestinal upset, cold/flu symptoms, and sleeping difficulties (Ming-hui & Yang, 2016; Peer et al., 2015; Thurber & Walton, 2012).

Findings from studies on perceived student stress suggest that normalizing student feelings of home sickness and facilitating social activities where students are able to make new friends may be helpful during this difficult transition (Ming-hui & Yang, 2016; Peer et al., 2015; Thurber & Walton, 2012). As well, holistic and mindfulness activities such as yoga, meditation, animal interactions, and deep breathing have been found to be helpful in providing students with alternative coping mechanisms (Ming-hui & Yang, 2016; Peer et al., 2015; Thurber & Walton, 2012). According to Morrison, Goolsarran, Rogers, and Jha (2013), mindfulness is an attentive state by which a person is present in the moment and putting the past and worries aside. Regardless of the modalities used, it is suggested that campus programming connect students with support resources and/or services on campus, i.e. the wellness center, social/academic clubs, academic advisors, and resident advisors (Ming-hui & Yang, 2016; Peer et al., 2015; Thurber & Walton, 2012).

Growing evidence shows that AVPs are increasingly prevalent on college campuses in the US (Fine, 2015), and have both social and health benefits for students. Picard (2015) illustrated a positive effect on student mood and anxiety through participation in an AVP.

Crossman and Kazdin (2016) demonstrated that the mere presence of an animal positively impacted the way students viewed aspects of the environment, and brief interaction with animals produced positive changes in blood pressure, heart rate, and positive emotions. The steady growth of AVPs on college campuses suggests that college age students are interested in AVP (Adamle et al., 2009; Fine, 2015). Further, the evidence suggests that beyond growing student interest in AVPs, the introduction of AVPs has demonstrated a positive effect on student perceived stress, mood, and anxiety (Barker et al., 2016; Bjick, 2013; & Picard, 2015).

An AVP provides an opportunity for participants to interact with animals, most commonly dogs, to promote feelings of happiness and well-being (Crossman & Kazdin, 2016). A college AVP is designed to provide a positive coping strategy for its participants. Given the large number of AVP's on college campus' in the US it stands to reason that there is great variability in procedures, frequency, settings, dog-handler teams, certifications, number of animals, and even species of animal used for interactions. However, there are a number of characteristics that make AVPs appealing for campus communities: (a) efficiency and affordability-AVPs are usually staffed by unpaid volunteers from the community and able to serve a large number of students at once; (b) flexibility and accessibility-AVPs are visible and circumvent help seeking behaviors, intake paperwork, appointments, time commitments, and wait lists; (c) acceptability-AVPs remove the stigma associated with traditional stress reduction services; (d) increase student engagement and promote social interaction; and (e) appealing-students often perceive that the AVP will benefit them, thus, students require little persuasion to participate in such programs (Crossman & Kazdin, 2016).

While animals have proven to be beneficial to the health of most humans, not everyone will benefit from AVP. Factors that should be considered include how individual humans feel

about animals, what exposure they have had to animals, general demographics, and culture (Beck & Katcher, 2003; Blouin, 2012). Culture is vastly influential to how a person views and perceives animals. Colleges may have a diverse population of American and exchange students from various countries and cultures. Therefore, colleges that implement AVPs must be aware of cultural perceptions of dogs. For instance, students from Arabic countries may perceive dogs as *dirty* or *dangerous,* and students from Asian countries may perceive dogs as livestock (MacLachlan, 2010). American perceptions of dogs run the gamut from *family member* to *objects of disposal* and *abuse* (American Society for the Prevention of Cruelty to Animals, 2016). These factors must be considered while developing and implementing an AVP to protect both humans and animals.

Rationale

The Transactional Model of Stress and Coping, based on 10 key constructs, formally frames the cognitive processes used by individuals when coping with stressful situations (Glanz, Rimer, & Lewis, 2008; Ming-hui & Yang, 2016). The process begins with a *primary appraisal*, or a period when the individual is evaluating the weight of a stressful situation, and the potential threat the stressor poses to them (Glanz et al., 2008; Ming-hui & Yang, 2016). The primary appraisal process is followed by a *secondary appraisal* process whereby the individual contemplates how much control they have over the stressor and evaluates their coping resources (Glanz et al., 2008; Ming-hui & Yang, 2016). The third step in the process relates to the *coping efforts* used by the individual to arbitrate their primary and secondary appraisal of the stressor(s) (Glanz et al., 2008; Ming-hui & Yang, 2016). Once an individual uses their coping skills to judge the weight, threat, and perceived control over the stressor they employ, *problem*

management strategies, to alter the stressful situation (Glanz et al., 2008; Ming-hui & Yang, 2016).

The fifth and sixth steps in the process are interdependent problem management strategies that support one another. The fifth step, a construct referred to as *emotional regulation* is a strategy intended to change the way the person thinks or feels about a stressful situation (Glanz et al., 2008; Ming-hui & Yang, 2016). While the sixth construct, *meaning-based coping* experiences, is a strategy employed by the individual during the period of emotional regulation to induce positive emotion, which may encourage the individual to re-enact this coping mechanism in the future (Glanz et al., 2008; Ming-hui & Yang, 2016). The use of positive emotional regulation strategies, combined with, meaning-based coping experiences, leads to the seventh step labeled, *outcomes of coping* (Glanz et al., 2008; Ming-hui & Yang, 2016). The outcomes of coping are positive health behaviors, functional status, and emotional well-being experienced when an individual successfully navigates through a stressful situation (Glanz et al., 2008; Ming-hui & Yang, 2016).

Dispositional coping styles, the eighth construct, describes the ways in which an individual generally behaves, such dispositions remain relatively stable throughout the lifespan and effect a person's functional or emotional reaction to stress (Glanz et al., 2008; Ming-hui & Yang, 2016). The ninth and 10th constructs are labeled *optimism* and *information seeking* (Glanz et al., 2008; Ming-Hui & Yang, 2016). These elements of the model suggest an attentional approach to seeking to resolve stressful situations and a generalized expectation of positive outcomes (Glanz et al., 2008; Ming-hui & Yang, 2016).

According to Ming-hui and Yang (2016), cognitive appraisal is a process which uses perception-related traits to cope with stress. These traits are as follows: (a) trait resilience; (b)

self-efficacy; and (c) secure attachment (Ming-hui & Yang, 2016). These traits are acquired throughout a person's life from positive experiences with managing stressful situations, and are activated by new stressful situations (Ming-hui & Yang, 2016). Trait resilience matures as a person effectively solves problems; self-efficacy is developed by accomplishing perplexing tasks; and, secure attachment is cemented as young children experience positive or negative interactions with adults (Ming-hui & Yang, 2016).

As students experience new stressors they use learned *primary* and *secondary appraisal* techniques to navigate each situation. The student then decides whether they are stressed, and if they are stressed can this perceived stress be managed using past coping strategies (Glanz et al., 2008). The reason this framework is useful in the design of this project is its usefulness in understanding how the college student population may cope with perceived stress generated during the transition from adolescence to adulthood (Glanz et al., 2008).

Adamle et al. (2009) conducted a study to evaluate college student's interest in animal visitation and found that most of its participants reported that therapy dogs were beneficial as a supplementary support system during stressful times. This study inspired the project organization to run an informal pilot study whereby two individual stress reduction programs were combined to measure student interest in AVP. The first program was a weekly *stress clinic* sponsored by the wellness center where students were invited to learn about perceived stress reduction strategies while doing crafts, meditation, yoga, and other mindfulness activities. The second program was a biannual AVP sponsored by the library where students visited with the dogs only.

There were challenges noted for each program. The weekly *stress clinic* was poorly attended while the biannual AVP received overwhelming attendance. Attendance nearly tripled

once the two programs were combined as an *AVP stress reduction clinic*. Adamle et al. (2009) found that AVP is a catalyst to establishing new social relationships, lessening attachment-related stress, and helping students to manage new stressors. These findings suggest that AVP is perhaps a *meaning-based* intervention in college student populations who might seek to foster or cultivate new *coping strategies, problem management* techniques, and *emotional regulation* practices. Therefore, the assumption that student perceived stress will be decreased by using this model to design the intervention is warranted.

Specific Aim

The purpose of this AVP intervention was to provide students with a *meaning-based coping* strategy for perceived stress. The programs design was intended to attract a greater number of students to attend stress reduction social offerings to help them self-identify and adjust their learned *dispositional coping* style to a more *optimistic* perspective. As well, the goal of the intervention was to create a positive *information seeking* experience for the students and to measure the impact of the AVP on student stress perceptions and participant acceptance of dogs as a therapeutic tool.

Methods

Context

Two contextual elements considered at the inception of this project were the dynamics of the organization and the external environment. College campuses are small communities within larger communities that work in collaboration with each other. The project organization is a small college that is set inside a small rural community in Vermont where resources may be limited. Although, the college has its own health care center services are limited and students are often referred out to community providers. Rural Vermont providers are frequently unable to

accommodate the influx of college students, and students must arrange personal transportation to community providers limiting access of care further. Collaborative and creative interventions that are easily accessible, affordable, and acceptable for students, college, and greater community are needed to improve health care resources.

This AVP intervention meets the above criteria in the following ways: (a) accessibility - meetings are on campus; (b) affordability – the therapy teams are usually community volunteers; and, (c) acceptability- the literature reports students enjoy interacting with the dogs and AVP tends to remove the stigma associated with traditional stress reduction programs (Adamle et al., 2009; Crossman & Kazdin, 2016). Also, The American Veterinary Medical Association (2013) ranked Vermont as the top pet owning state in the US suggesting students at this college may be more accepting of AVP. The college health care leadership were integral in the development of this project, and fully committed to providing innovative, evidence-based interventions to reduce student perceived stress.

Intervention

In the fall semester of 2015 a committee, led by a project coordinator, was formed to discuss the implementation of an AVP on campus to reduce student perceived stress. The director of the college Wellness Center, and the Wellness Education Coordinator were vital members of the committee as each provided the team with background information on current perceived stress reduction practice, and communicated desired outcomes. They also developed and executed mindfulness activities at the stress clinics each week (i.e. meditation, yoga, deep breathing). A campus librarian, who organized a current biannual AVP on campus sponsored by the library, was asked to join the committee to assist with contacting our community therapy dog team partners, and securing a consistent meeting room in the library for the duration of the

project implementation. A director of a local therapy dog organization was also on the committee to assist with coordination of therapy dog teams for all scheduled meetings, and to guide best practice for AVP.

Sample and setting. The target population for this pilot project was 1,700 full-time and 400 part-time undergraduate students at a small college in rural Vermont. The weekly intervention took place in a handicap accessible meeting room attached to the college's library. The meeting room has an open design with floor to ceiling picture windows that look out on the surrounding hillside, comfortable seating including large throw pillows, soft lighting, and a spacious carpeted area for students to relax. In this homelike environment, students were able to interact with the wellness center staff, perform clinic activities, and mingle with each other and the dogs.

Design and procedure. This longitudinal, evidence-based pilot project compared the findings of an AVP stress reduction program between participants on measures of perceived stress and human-animal bonding at the time of pre-, intra-, and post-intervention. Two weeks prior to the start of the project, a convenience sample of participants (N = 2100) were recruited via a campus-wide email. Following the e-mail, a pre-intervention information meeting was advertised to the entire college student population via e-mail, flyers, and word of mouth. Students were invited to an information meeting conducted in the meeting room. On the appointed day and time 39 students arrived in the meeting room where the project coordinator provided them with an introduction to the program, project team, and dog-handler teams, as well as an information sheet with the program schedule of events and the project coordinator's contact information. An announcement was made at this meeting requesting that only the students committed to participate in the entire project contact the project coordinator via e-mail.

Twenty-four self-identified participants subsequently contacted the Project Coordinator and they were each provided with a *SurveyPlanet* link where they could fill out a one-time project consent. Students were assigned a predetermined participant identification code upon initial contact with the project coordinator. This code was used on all project paperwork. In addition, all data was further de-identified to reduce the precision of the information. For instance, ages were changed to age groups, and year in school was grouped into levels.

Weekly meeting procedure. A weekly *Pause with PAWS* program meeting was scheduled every week for 10 weeks. Meetings were schedule consistently on Tuesdays from 12:30 pm – 2:00 pm in the meeting room. The 90-minute meetings were conducted in accordance with the industry standard for length of animal visitation (Crossman & Kazdin, 2015). The dog-handler teams interacted with students throughout the meetings. The interaction between the participants and dogs included casual mingling, petting, walking, and simple presence or no contact if that is what the participant chose. Participating students were asked to complete the PSS-10 and CSAWPBS on the *SurveyPlanet* link after the fifth meeting.

Post-intervention procedure. Fourteen students completed all required surveys and attended all scheduled meetings. After the final session, the project coordinator sent the participants a follow-up email reminding them to fill out the project terminal post-intervention PSS-10, CSAWPBS, and program evaluation (see Appendix A). Data were exported from *SurveyPlanet* into the Statistical Package for the Social Sciences (SPSS, Version 23) for analysis.

Study of the Intervention

The approach chosen for assessing the impact of this intervention was participant perspective survey questions over time. A quantitative, longitudinal participant survey approach allows for a numeric explanation of participant opinions, outlooks, and tendencies over time

(Creswell, 2014). One-way ANOVA, as displayed in Tables 1 and 2, are used to display how the observed outcomes because of the intervention. Data were correlated using bar graphs as displayed in Figures 1, 2, and 3. A correlation design is used to measure participants on variables of interest using evidence-based instruments already established as valid and reliable intending to ensure internal/external validity, and generalize the results from a sample to a population (Brown, 2014). The PSS-10 was administered pre-, intra-, and post-intervention measuring student perceived stress; and, the CSAWPBS was administered intra- and post-intervention to measure human-animal bonding. The post-intervention program evaluation was administered at the end of the project to measure participant perceptions of program efficacy.

Measures

The measures used are consistent with the contextual elements of the project. These survey measures were administered via *SurveyPlanet* online to ensure it was an accessible, affordable, and acceptable data collection process for participants and the organization. Data collected include: a pre-intervention student demographics survey, pre-, intra- and post-intervention PSS-10, intra- and post-intervention CSAWPBS, and a post-intervention program evaluation (see Appendix A). All data was collected and managed by the program coordinator to ensure confidentiality. Once data was converted to IBM SPSS statistics software a statistician was consulted to assess completeness and accuracy of data.

Demographic Survey. An investigator-designed demographic survey was employed to measure participant gender, age range, ethnicity, college level, relationship status, and residence. A *SurveyPlanet* link was sent to participants by project coordinator via email. Only the students that completed the project consent form were sent subsequent project surveys.

Perceived Stress Scale. Created by Cohen, Kamarck, and Mermelstein (1983), the PSS-10 is a 10-item Likert scale self-report measure of perceived stress that surveys participant thoughts and feeling during the previous month indicating student previous perceived stress levels. In a similar animal visitation project, the PSS-10 coefficient alpha reliabilities reported in college students, with pre- and post-intervention correlations was 0.85, with a validity of .52 -.76 (Barker et al., 2016). The PSS-10 was administered pre-intervention (baseline), intra-intervention (five weeks), and post-intervention (10 weeks). The legend for this survey is as follows: 0 = never, 10 = almost never, 20 = sometimes, 30 = fairly often, and 40 = very often.

The Center for the Study of Animal Wellness Pet Bonding Scale Survey. Johnson and Meadows (2003) CSAWPBS is a 28-item Likert scale designed to measure participant perception regarding the dog's presence, feelings of reciprocity between the participant and the dog, and participant degree of attachment to the dog. In a similar project, the CSAWPBS was shown to have internal consistent coefficient alpha level of 0.892 and a validity of .49 - .68 (Fulton, 2005). The CSAWPBS survey was collected for each student participating in the project at five weeks (baseline), and at 10 weeks. A pre-intervention measurement would be counterintuitive as the students had not interacted with the dogs thus far. The legend for this survey is as follows: 28 = true, 56 = more often true, 84 = neutral, 112 = more often false, and 140 = false.

Program Evaluation Survey. The last survey was an investigator-created program evaluation survey which was administered at the end of the 10-week project. It was designed to measure student perceptions of program efficacy. The legend for this survey was: 10 = disagree, 20 = disagree somewhat, 30 = neutral, 40 = agree somewhat, and 50= agree.

Analysis

Quantitative data was collected and analyzed by the project coordinator. Data was collected via *SurveyPlanet* converted for use in IBM SPSS statistics software. After conversion, these data were used to determine descriptive statistics such as age range, gender, degree-level, and race. Bar graphs were used to describe the participants PSS-10 at baseline, five weeks, and 10 weeks and CSAWPBS scores at five weeks, and 10 weeks. Then inferential statistics were analyzed using a one-way analysis of variance (ANOVA) to understand the variables within pre-, intra-, and post-intervention scores for perceived stress and animal acceptance over time.

Ethical Considerations

During the planning of this intervention many ethical concerns were considered. To ensure the protection of the human participants the project was reviewed and received the approval of the college's international review board (IRB) review prior to the recruitment of participants. While animal visitation programs have been shown to be beneficial to the health of the majority of people, not every human will benefit from AVP. Humans that have pet allergies, fear animals, intend harm to animals, or are from diverse cultural groups may not benefit from, or be capable of, bonding with a dog (Beck and Katcher, 2003; Blouin, 2012).

Given the reciprocal nature of the therapy, it is also important to understand the effect AVP has on animals. Many studies show that not only does a human’s blood pressure and heart rate decrease while petting an animal, the petting has the same effect for the animal (Amiot & Bastian, 2014; Goddard & Gilmer, 2015; Wells, 2009). Despite these findings, animal abuse and exploitation is an ethical concern whenever animals are being used for a human purpose. Therefore, it is important to understand the distinction between *use of an animal* and *exploitation*

of an animal. Exploitation is a relationship where the person benefits and harms the animal; whereas, use of an animal as a therapeutic tool is not exploitation if the animal is not intentionally harmed in the activities it is being used for (Balluerka, Muela, Amiano, & Caldentey, 2014; Zamir, 2006). For this reason, it is essential that AVPs use certified therapy dog teams. A therapy dog team involves a human handler and one dog with a working bond. The human handler can *read* the dog's behaviors so the dog can be removed from the AVP environment to help prevent the dog from physiological or psychological harm (Fine, 2015).

Results

Demographics

Simple descriptive statistics such as age range, gender, residence, race, and degree-level were analyzed by the project coordinator. The entire project population (n = 14) were between the ages of 18-24 years, female, lived on campus, and self-identified as Caucasian. The only discernible difference in student demographics was in the level of education. Most of the participants were freshman (n = 10, 72%), and the remaining participants were sophomores (n = 4, 28%). Quantitative data were collected and analyzed at baseline, five weeks, and 10 weeks.

Perceived Stress Scale Survey

Measures of perceived stress were obtained at baseline, five weeks, and at the end of program (10 weeks). This survey was used to assist students to conduct a *primary* and *secondary appraisal*. Findings indicate that the mean perceived stress scores of participants whom fully participated in the program (n = 14) decreased over the course of the intervention program with a mean of 25.07 (SD = 5.313), 19.86 (SD = 4.452), and 18.79 (SD = 7.81), at baseline, five weeks, and 10 weeks, respectively (see Figure 1). A one-way analysis of variance

(ANOVA) determined a significant difference ($p = 0.02$) between the pre-, intra-, and post-intervention PSS-10 scores [Table 1 goes here]. This indicated that the students who participated in the animal visitation stress clinic perceived less stress over a 10-week period as compared to the beginning. Thus, acting as a *problem management* strategy.

The Center for the Study of Animal Wellness Pet Bonding Scale Survey

Measures of student perceptions regarding pet bonding were obtained at five weeks and 10 weeks. Findings indicate that the mean CSAWPBS scores of participants whom fully participated in the program ($n = 14$) decreased over the course of the intervention program with a mean of 93.7857 ($SD = 42.27234$), and 70.2857 ($SD = 30.74568$), at five weeks, and 10 weeks, respectively (see Figure 2). A one-way analysis of variance (ANOVA) determined an insignificant difference ($p = 0.10$) between the intra-, and post-intervention CSAWPBS scores [Table 2 goes here]. This indicated that the participants did not feel bonded to the dogs as a result of this intervention.

Program Evaluation Survey

The mean score on the program evaluation survey was 44.38 ($SD = 4.718$). To compare the survey statements each survey statement was analyzed in an inclusive bar graph (see Figure 3). The highest mean scores were for ($M = 4.93$, $SD = 0.267$) statements indicating: (a) *the therapy dogs made me feel positive emotions*, (b) *the therapy dogs are what made me interested in this program*, and (c) *overall, this is a beneficial program for college students, and I would recommend it to my peers*. The next highest mean scores ($M = 4.64$, $SD = 0.497$) were for the statement, *this program provided alternative coping strategies for stress management*. The statement, *I am likely to continue visiting with therapy dogs after this project is complete* had a

mean score of 4.57 (*SD* = 0.514). Two statements had a mean of 4.5 (*SD* = 0.855): (a) *this program helped me to understand how to cope with stressful situations,* and *I found the activities conducted in the sessions will be useful in my everyday life*. The last two statements, *as a result of this program I learned about the health care resources on campus*, and *this program helped me adjust to the transition from home to college* had means of 4.21 (*SD* = 1.122, and the latter's mean was 3.57 (*SD* = 1.284).

Discussion

Summary

The participants of this project were demographically homogenous. A one-way analysis of variance (ANOVA) showed a significant difference between measures on the PSS-10 (*P* = 0.02) indicating that student perceived stress decreased significantly over time. The CSAWPBS increased slightly; yet showed no significant difference between intra-and post-measures, thus, suggesting that while interactions with the dogs did increase positive emotions over time, students experienced limited attachment to the dogs. The participants overwhelmingly felt that the presence of therapy dogs increased positive emotions and that the dogs inspired student participation in the *stress clinic*. Overall, the findings from this AVP project suggests that there is positive outcome potential on college student perceived stress and quantified student interest in AVP.

Interpretation

The pre-, intra-, and post-intervention PSS-10 results clearly show a significant decrease in the perceived stress scores of participants over time and exposure to the intervention as indicated by the narrow range of scores around the mean (standard deviation). The one-way ANOVA of these data demonstrates a 98% confidence that it was the program which decreased

student perceived stress over 10 weeks. Student perceived stress decreased during the time students interacted with dogs. This information was positive and encouraging. However, it was pivotal to dig deeper to understand if the interaction with the dogs contributed to this result. For this reason, the CSAWPBS survey was administered to the students at both five and 10 weeks.

The CSAWPBS survey positive outcomes are associated with low numbers, and the negative outcomes are associated with high numbers. Thus, the results of this survey show that after five weeks of interaction with the dogs the mean was between *neutral* and *most often false*. Therefore, after five weeks students were not able to ascertain an attachment to the dogs. It is reassuring that at the end of 10 weeks, students' perceptions had improved to the positive side of *neutral* and were leaning towards *most often true.* These results support the project team's assumption that therapy dogs could be a catalyst to student participation in a *stress clinic*, have a therapeutic effect on students, and contribute to a decrease in student perceived stress.

Several CSAWPBS questions were isolated to differentiate between *student positive emotions* in relation to the dogs' visit; and the level of *student bonding* with the dogs [Table 3 goes here]. These questions include: (a) *the dog visitor is always glad to see me*, (b) *I look forward to getting up in the morning on days when I will see the dog visitor*, (c) *the dog visits make me feel better, (d) the dog visitor tries to comfort me*, (e) *I feel attached to the dog visitor*, (f) *I miss the dog visitor between visits*, (g) *I look forward to the dog visits*, (h) *the dog visits make me feel happy*, (i) *the dog takes my mind off my troubles*, and (j) *the dog helps me feel secure*.

Each of these statements mentioned above showed positive results. One statement, *I feel attached to the dog visitor* was an outlier. Students did not show any movement away from

neutral with attachment and bonding. This is thought-provoking as it was the same five therapy dog teams that visited each week. There could be several variables which serve this finding, i.e. no personal investment in the care of the dog, positive cognitive appraisal skills, short duration of program, personal characteristics, etc. Hence, the project team concluded that despite the neutrality of attachment to the dogs, participants enjoyed spending time with the dogs, and the interaction had a positive therapeutic effect for participants.

The program evaluation data analysis (see Figure 3) also showed promising results, but also some opportunities for improvement. What was most inspiring is that students overwhelmingly felt positive emotions after visiting with the dogs. Of equal importance to the aim of this project, students indisputably reported that visiting with the dogs is what made them interested in participating in the project. It is promising that most students felt they learned about new coping strategies and how better to manage stressful situations. While still positive results, less encouraging is students reports of being less confident that the program provided them with information about health care resources on campus. Students remained between *neutral* and *agree somewhat* that the program helped them adjust from home to college. Overall, this project is testimony to the growing evidence on the benefit of AVP to college student perceived stress. The finding of this project suggests that this AVP is a *meaning-based* intervention for a college student population who might seek to foster or cultivate new *coping strategies, problem management* techniques, and *emotional regulation* practices.

Limitations

The findings of this intervention project are limited by having a small population of respondents. However, it is important to note that the target population for this intervention project was college students aged 18-24 years and all female, so lack of diversity with respect to

age was expected. However, there was no diversity in terms of gender and ethnicity, so it is difficult to know if such a program would be beneficial for a more diverse population.

The initial recruitment yielded 39 participants and only fourteen completed all required surveys and attended all visitation meetings. The initial goal was to recruit at least 20 participants, but no more than 50. The project team determined that the project initially yielded 39 participants due to the addition of the therapy dogs at the *stress clinic*. It is surmised that the weekly commitment was difficult for students to maintain resulting in only 14 completing the project requirements.

The third limitation encountered during the implementation of this project was weather. The program implementation took place during the period from mid-January until mid-March. On two occasions, the college closed due to weather emergencies. Therefore, the participants were unable to visit with the dogs due to the cancellations. As well, it is difficult to determine if the weather emergencies added to or reduced the perceived stress of subjects-this was not measured.

Conclusion

Throughout history humans and animals have had a symbiotic relationship. There is overwhelming evidence in the literature supporting animals as therapeutic tools in many populations in the US. These populations include hospitalized people, people with Alzheimer's disease, palliative care, correctional facilities, veterans, the elderly, and in the community (Matuszek, 2010). For college students who live away from home this link may be intermittently put on hold for years as animals are typically not allowed to live in student housing. The outcomes of this project offer the student population, college health care facilities, and the

college community at large an effective, efficient, and holistic alternative program for stress management.

The results of this project clearly demonstrate a decrease in participant perceived stress after visiting with dogs over eight weeks potentially improving academic success for each participant. This benefits the participant, participant's family, local/regional employers, and the community at large. Participants reported that it was the addition of the dogs to the *stress clinic* which drew them to participate indicating that they are accepting of this modality. This creative intervention will also benefit college health care providers in that it is affordable for the organization, and accessible to all students. The program is staffed by volunteers, has amazing health benefits, and will potentially help decrease perceived stress in students.

The future of *Pause with Paws* is optimistic. The program has continued at the project site with plans to expand. Although expansion plans are still in the conceptual stage, it stands to reason that colleges could grow their own volunteers. This project team envisions having a Vermont therapy dog organization provide therapy dog certification classes on campus to college faculty, staff, and local community members. This scenario would hope to increase faculty service to community opportunities, community volunteerism, the amount of therapy dog teams able to serve this population, decrease cancellations due to weather, and improve the quality of life for the entire college and local community. This program has contributed to the growing evidence substantiating that AVPs may be one of several valid therapeutic interventions to reduce college student perceived stress, and that AVPs would potentially have the same impact on all college students in the US; as well, most human beings.

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Table 1

One Way ANOVA – PSS-10

Variable	*Sum of Squares*	*Df*	*Mean Square*	*F*	*Sig.*
Between Groups	316.619	2	158.310	4.351	.02
Within Groups	1419.000	39	36.385		
Total	1735.619	41			

Note. $N = 14$.

Table 2

CSAWPBS One Way ANOVA

Variable	*Sum of Squares*	*Df*	*Mean Square*	*F*	*Sig.*
Between Groups	3865.750	1	3865.750	2.830	.10
Within Groups	35519.214	26	1366.124		
Total	39384.964	41			

Note. $N = 14$

Table 3

CSAWPBS Isolated Statements of Pet Bonding

Statements of Pet Bonding	5 weeks		10 weeks	
	n	*M (SD)*	*n*	*M (SD)*
The dog visitor is always glad to see me.	14	3.44 (1.688)	14	2.86 (1.956)
I look forward to getting up in the morning on days when I will see the dog visitor.	14	3.28 (1.526)	14	2.36 (1.336)
The dog visits make me feel better.	14	3.44 (1.723)	14	2.64 (1.646)
The dog visitor tries to comfort me.	14	3.17 (1.339)	14	2.64 (1.336)
I feel attached to the dog visitor.	14	2.72 (.958)	14	2.86 (1.351)
I miss the dog visitor between visits.	14	3.33 (.978)	14	2.79 (1.369)
I look forward to the dog visits.	14	3.67 (1.749)	14	2.36 (1.336)
The dog visits make me feel happy.	14	3.56 (1.790)	14	2.86 (1.610)
The dog takes my mind off my troubles.	14	3.50 (1.654)	14	2.36 (1.598
The dog helps me feel secure.	14	3.78 (1.353)	14	2.57 (1.555)

Note. $N = 14$

Figure 1.

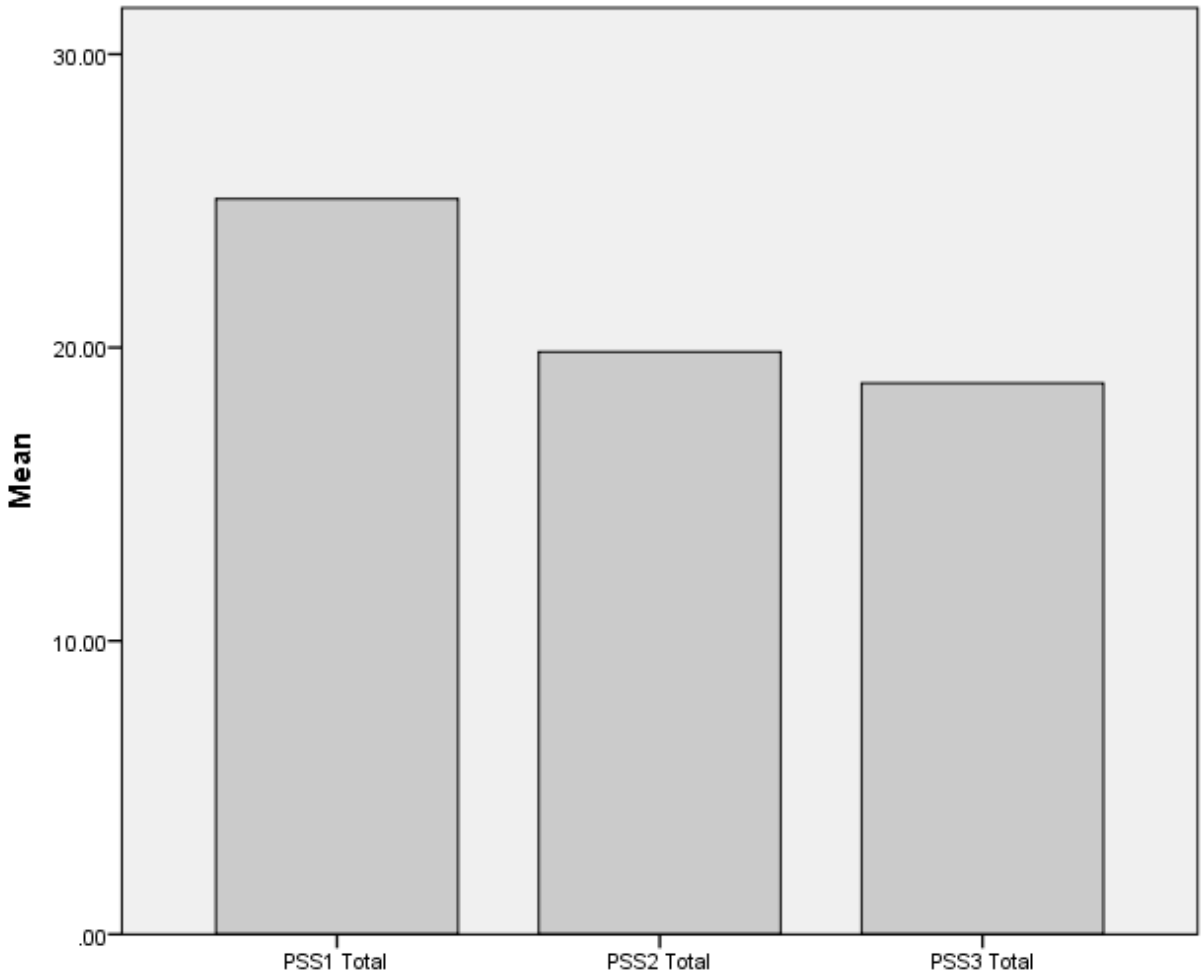

Figure 1. PSS-10 Baseline, Five Week, and 10 Week Mean Comparison

Bar graph representation of PSS-10 comparison from baseline to five weeks to 10 weeks. The X axis represents the total possible means scores for the PSS-10 survey. The Y axis represents the PSS1 Total = Perceived Stress Scale at baseline; PSS2 Total = Perceived Stress Scale at five weeks; and PSS3 Total = Perceived Stress Scale at 10 weeks.

Figure 2.

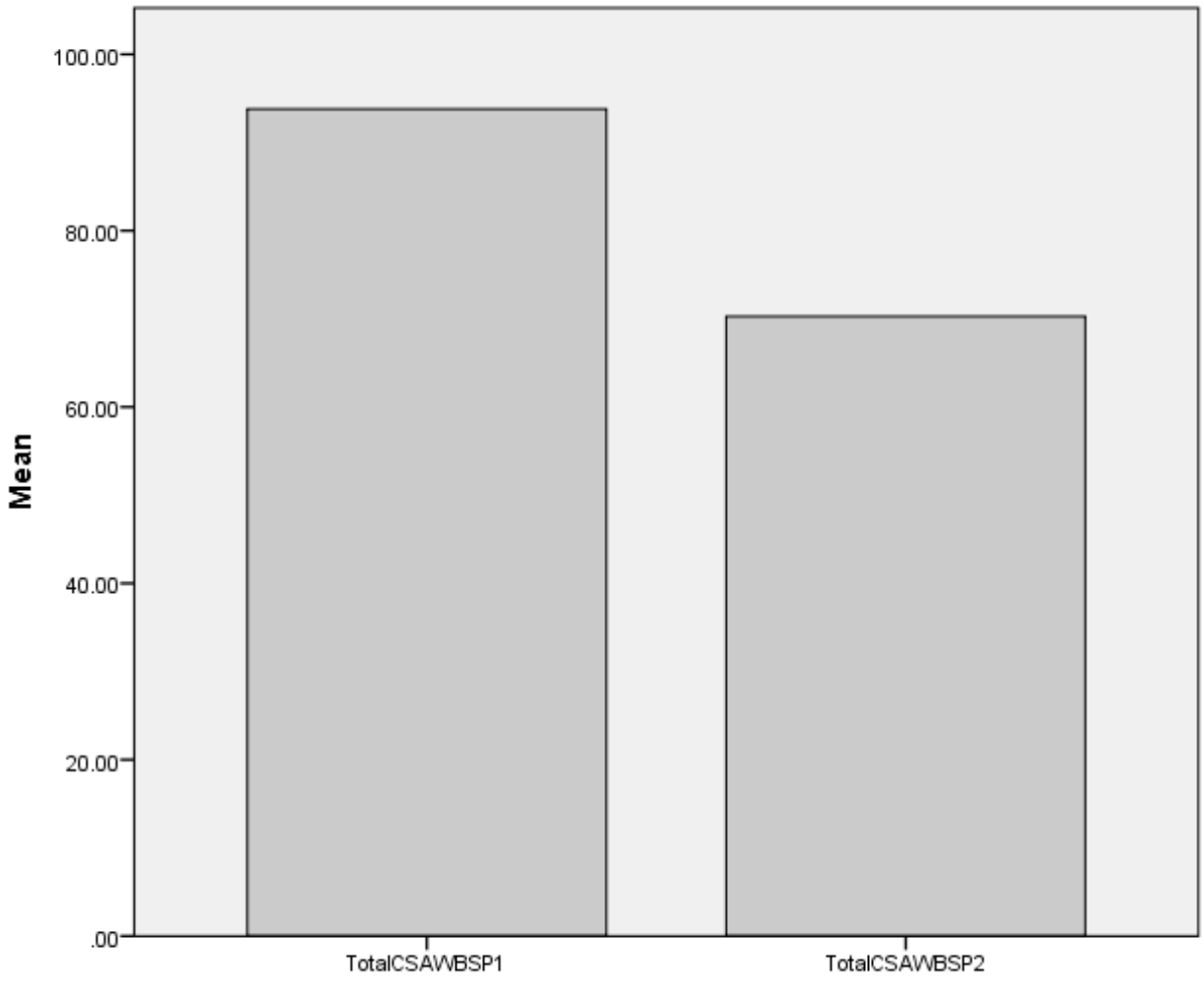

Figure 2. CSAWPBS Five Week and 10 Week Comparison of Means

Bar graph representation of CSAWPBS Five Week and 10 Week Comparison of Means. The X axis represents the Total CSAWPBS score. The Y axis represents total CSAWPBS1 = Center for the Study of Animal Wellness Pet Bonding Scale at five weeks (baseline); and total CSAWPBS2 = Center for the Study of Animal Wellness Pet Bonding Scale at 10 weeks. Positive outcomes are associated with low numbers, and negative outcomes are associated with high numbers.

Figure 3.

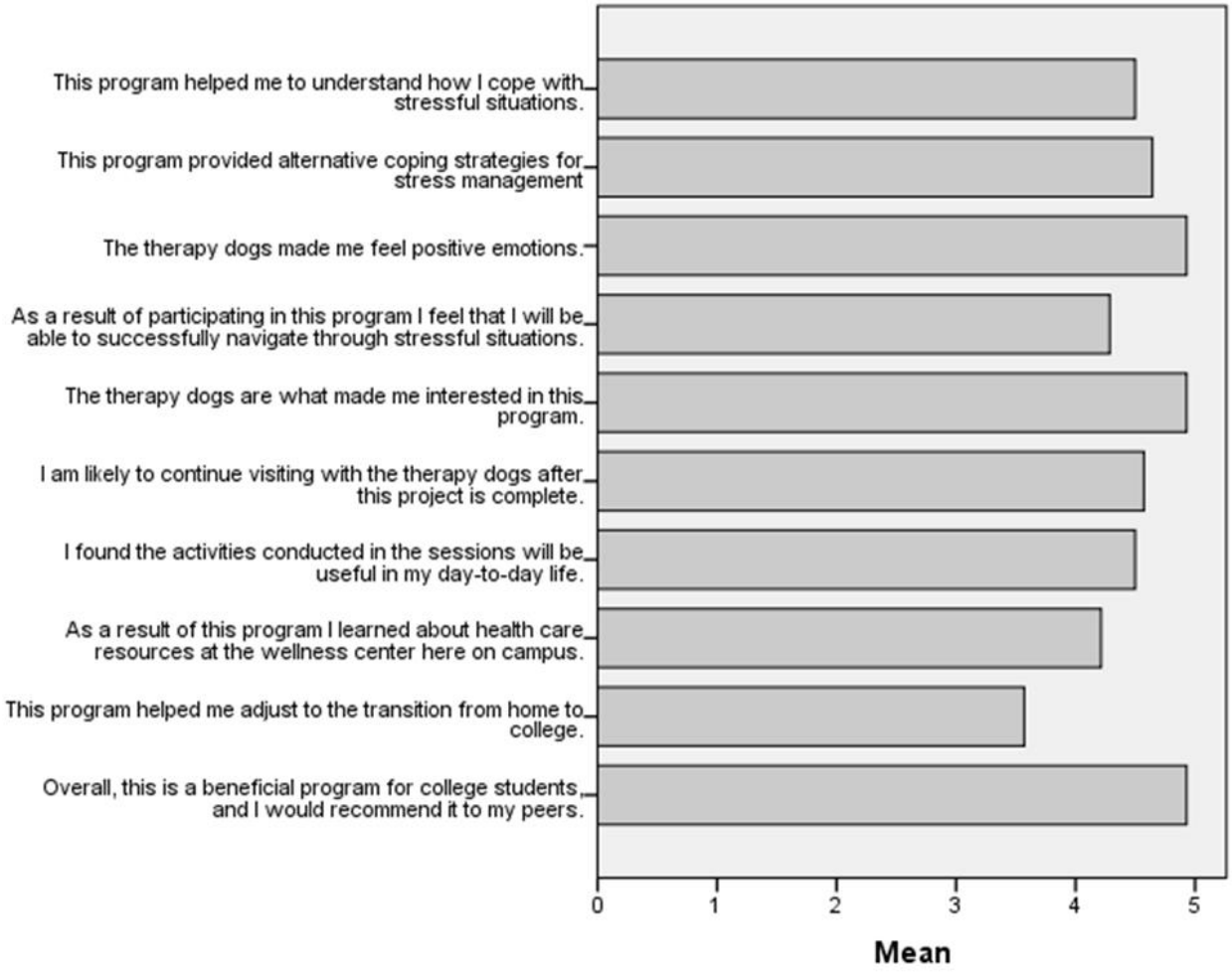

Figure 3. Statement comparison for Program Evaluation and Improvement

Bar graph representative of a comparison of Program Evaluation statements. The X axis represents the specific survey questions. The Y axis represents the total mean of each individual statement on a "0" to "5" scale with "0" being low (negative) and "5" being the highest (positive).

Appendix A: Project Evaluation

Pause with Paws Pilot Project: Implementation of an Animal Visitation Stress Reduction Program at a Small Vermont College

Program Evaluation

Author created survey.

1 = Disagree 2 = Disagree somewhat 3 = Neutral 4 = Agree somewhat 5 = Agree	
1.) This program helped me to understand how I cope with stressful situations.	1 2 3 4 5
2.) This program provided alternative coping strategies for stress management.	1 2 3 4 5
3.) The therapy dogs made me feel positive emotions.	1 2 3 4 5
4.) As a result of participating in this program I feel that I will be able to successfully navigate through stressful situations.	1 2 3 4 5
5.) The therapy dogs are what made me interested in this program.	1 2 3 4 5
6.) I am likely to continue visiting with the therapy dogs after this project is complete.	1 2 3 4 5
7.) I found the activities conducted in the sessions will be useful in my day-to-day life.	1 2 3 4 5
8.) As a result of this program I learned about health care resources on campus.	1 2 3 4 5
9.) This program helped me adjust to the transition from home to college.	1 2 3 4 5
10.) Overall, this is a beneficial program for college students, and I would recommend it to my peers	1 2 3 4 5

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>
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I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA *Publication Manual*.

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Mentor name and school: Catherine Suttle, PhD - School of Nursing and Health Sciences

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