

ANIMAL-ASSISTED INTERVENTIONS IN OCCUPATIONAL THERAPY  
EDUCATION

A Thesis to the faculty at Stanbridge University in partial fulfillment of the requirements  
for the degree of Master of Science in Occupational Therapy

by

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## Certification of Approval

I certify that I have read *Animal-Assisted Interventions in Occupational Therapy* by Weyam Hattab, Ericka Limiac, Denise Renteria, and Victoria Sinsay, and in my opinion, this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy at Stanbridge University.



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## **Abstract**

In this thesis, we explored the perceived benefits of Animal Assisted Interventions (AAI) as told from the perspective of occupational therapy (OT) and OT assistant students. In addition, we sought to understand the processes involved in the creation and implementation of AAI programs in educational settings from the perspectives of professionals involved in the field of AAI. Finally, we hope to contribute to the limited existing body of knowledge surrounding AAI as a viable resource for the well-being of students in the field of OT. This study utilized a mixed-method approach to achieve the above aims. Student participants recruited from Facebook groups were provided with a survey to collect their opinions on AAI. We also conducted semi-structured interviews with five professionals from Facebook groups and the Association of Animal-Assisted Intervention Professionals (AAAIP). Data collected from the surveys indicated that students perceived AAI as a positive contributor to student well-being. In addition, students believe that activities involving interactions with animals such as petting, and play demonstrate therapeutic benefits related to stress reduction. Results from the interviews supported findings from the surveys regarding AAI's positive effects on student well-being. In addition, AAI provides opportunities for occupational engagement that may otherwise be inaccessible. Based on the results, we conclude that AAI may be beneficial in the reduction of stress and improvement of the overall well-being of OT students. Furthermore, the integration of AAI programs within educational settings is likely to improve student morale and academic outcomes during periods of high academic stress.

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### **AAI in Occupational Therapy Education**

Stress is a state of mental tension or worry that arises in response to a challenging situation (World Health Organization, 2023). This state of mental being is a natural and common human response, and how we respond to it can have a significant impact on our well-being. Stress may cause feelings of nervousness, fearfulness, and anxiety which can influence our sleep, appetite, and energy levels (Centers for Disease Control and Prevention, 2023). Research shows that animal-assisted interventions (AAI) are beneficial in relieving mental health (Kivlen et al., 2022). Programs that involve therapy dogs or other animals may be beneficial for those who experience high levels of stress. Several studies have shown that AAI benefits students' well-being and reduces stress (Haefelin et al., 2020; Thelwel, 2019; Williams, Dagnan, et al., 2018). However, minimal research has been conducted on the effects of AAI on occupational therapy (OT) students. Our study contributes to the OT Research Agenda developed by the American Occupational Therapy Foundation (AOTF) and the American Occupational Therapy Association (AOTF & [AOTA], 2011). We did so by expanding occupational therapists' knowledge and skills in prevention and promotion as well as providing OT educators with additional resources to prepare OT students.

There is limited research outlining the design, implementation, and challenges of an AAI program. However, there are numerous ways to integrate AAI into OT practice or educational settings. AAI may induce client motivation, encourage involvement, foster companionship, and assist with activities of daily living (ADLs), such as grooming, bathing, feeding, and dressing (Winkle & Ni, 2019). Since AAI has positive effects on many client populations, it may be beneficial to examine how it affects student well-

being as well. It is important to examine how AAI affects student well-being because of its connection with stress. Mental and emotional well-being is an important part of the overall health and quality of life (QOL) of a person. Oftentimes, challenges in life can interfere with a person's mental well-being. These issues or challenges can include overcoming bad eating and sleeping habits, adjusting to higher academic obligations, multitasking, financial hardships, and social hurdles (Kivlen et al., 2022). Although these challenges can be stressful for most individuals, providing OT students with access to AAI may help them effectively manage their stress and promote well-being.

### **Terminology**

Key terms that we used throughout the study were AAI, stress, well-being, and OT. A definition is provided for each term.

#### **Animal Assisted Intervention**

AAI involves a range of therapeutic interventions and activities involving animals to promote individuals' physical, emotional, cognitive, and/or social well-being (Parbery-Clark et al., 2021). AAI is an umbrella term that refers to the use of various animal species for human benefit in various ways, such as animal-assisted therapy, animal-assisted education, and animal-assisted activity. AAI aims to improve cognitive, behavioral, socio-emotional, and/or physical functioning using a trained live animal and its advantage of human-animal interaction.

#### **Stress**

The World Health Organization (2023) describes stress as “a state of worry or mental tension caused by a difficult situation.” Students frequently experience heightened stress levels when taking exams (Binfet et al., 2018). Stress has been mentioned by

students as a contributing factor to feeling constantly under strain, losing sleep due to worry, and feeling unhappy and depressed. Binfet et al. (2018) point out that students can frequently get into arguments and conflicts because of stress, which is often accompanied by diminished cooperation and withdrawal. Stress during exams had more than half of the students feeling hopeless, while some reported that their depression levels made it difficult for them to function (Binfet et al., 2018).

### **Well-Being**

Well-being pertains to the possession of good health, emotional balance, and an overall sense of fulfillment in one's occupations and relationships (Pendleton & Schultz-Krohn, 2016). In addition, well-being may also be considered an umbrella term encompassing the complete scope of human life, including physical, mental, and social aspects. AAI results in some people experiencing more positive emotions, a decline in stress-related negative emotions, physiological signs of stress, and homesickness (Rothkopf & Schworm, 2021). The results of interacting with the dog alone have shown significant improvements in mood and well-being for students (Grajfoner et al., 2017).

### **Occupational Therapy**

OT is used to help people develop, recover, and maintain the skills and abilities they need for everyday living (AOTA, 2020). It focuses on helping people improve their physical, mental, and emotional well-being through personalized activities and exercises that are designed to improve their quality of life. The goal of an occupational therapy practitioner (OTP) is to help people prevent, lessen, or adapt to disabilities by engaging in occupation and meaningful activities. According to the "Occupational Therapy Practice Framework: Domain and Process-Fourth Edition" ([OTPF-4]; AOTA, 2020), the

therapeutic use of daily routine activities with individuals, groups, or populations is to increase or facilitate involvement. OT helps individuals with different conditions, which include ADLs, client factors and performance skills, and occupation-focused (Lamb & Metzler, 2014). OT can also help people with physical, cognitive, psychosocial, and sensory impairments. Treatment plans are individualized and tailored to each client's needs, and can involve activities such as exercise, work, leisure, self-care, and sleep.

### **Statement of Problem**

The purpose of this study was to investigate the advantages of AAI in higher education, with a specific focus on understanding how it benefits OT students. Govender et al. (2015) observed high levels of stress among OT students with an increased number of them resorting to maladaptive behaviors to cope with the demands of accelerated OT programs. OT students are facing stress and require an affordable wellness solution. AAI offers a cost-effective approach to addressing mental health concerns. However, there is limited research on the practicality of implementing such a program.

### **Literature Review**

#### **AAI and Well-being**

Students' QOL, anxiety, stress, and adjustment to a graduate school role all affect their well-being. Kivlen et al. (2022) used a randomized control study to see if there were significant differences in the QOL and educational occupational performance of graduate students in the control and treatment groups. The treatment group was able to interact with a therapy dog over the course of 8 weeks while the control group did not. In the group that engaged with the therapy dogs, QOL, mood, and well-being significantly increased, and anxiety and stress levels decreased (Kivlen et al., 2022). Prior research has

established that there is a positive correlation between the interaction of college students and therapy animals (Kivlen et al., 2022; Ward-Griffin et al., 2018). However, Haefelin et al. (2020) and Thelwel (2019) both looked at the effects of interacting with virtual dogs and in-person dogs on university students' mood and anxiety. These studies also found that while the effects the in-person dogs had on mood and anxiety were greater, interacting with a virtual dog still positively benefited the well-being of the students.

With the increasing popularity of therapy-dog programs at universities, Ward-Griffin et al. (2018) sought to evaluate the efficacy of such programs in improving the well-being of university students, as well as the longevity of the effects. Aspects of well-being were measured including perceived stress, perceived quality of life, affect, perceived social support, and happiness and energy levels. The study includes two components: monitoring the students' attitudes and perceptions throughout the process of a single therapy dog session, and the researchers' use of both an experimental group and delayed-treatment control group. A questionnaire was administered before and after the session for the experimental group and compared to data from the control group who had not yet received therapy dog exposure. The follow-up questionnaires were completed approximately 10 hours following the session. Results were analyzed to determine the long-term benefits of the therapy-dog sessions and demonstrated an overwhelmingly positive effect on student well-being. Therapy-dog sessions resulted in significant short-term reductions in perceived stress and increased happiness and energy levels. Results also indicated long-term benefits of therapy-dog sessions 10 hours later. Participants in the experimental group showed a reduction in negative affect and perceived stress, as well as an increase in perceived social support compared to the control group.

Johnson et al. (2023) found that animal videos watched by college students before advisement meetings improved well-being measures. Researchers found that both companion animal videos and wild animal videos can have a positive effect on college students. Additionally, companion animal stimuli improved the student's perceptions of their advisors. This study suggests that when students don't have access to in-person AAI, computer-mediated interventions can help fill the gap. Additionally, these findings further confirm the benefits of animals on well-being measures.

### **AAI and Stress**

More than 70% of graduate students report stressors that affect their daily performance (El-Ghoroury et al., 2012). Williams, Emond, et al. (2018) conducted a study to investigate the impact of an AAI on graduate students' stress and anxiety levels before an examination. Anxiety can have adverse effects on a student's academic success and can make it difficult for them to memorize and concentrate. Test anxiety is a specific form of anxiety that graduate students often experience, which can lead to a fear of academic failure and panic. Another stressor that students face is physiological stress, which refers to the body's response to external threats (Williams, Emond, et al., 2018). AAI is a technique that can help reduce stress levels, and the researchers measured participants' physiological stress by monitoring their heart rate and blood pressure.

Several studies addressed the benefits of AAI to the college student population. While Binfet et al. (2018) examined a drop-in program for college students throughout the semester, Peel et al. (2023) investigated the effectiveness of AAI for university students during a high-stress time like the first 2 weeks of examinations. According to Binfet et al. (2018), college students who attended the weekly drop-in session had lower

stress scores than when they came in. The researchers found that students' self-reports of stress dramatically decreased when they interacted with therapy dogs. They also found that weekly sessions most likely contributed to lower stress levels rather than having the drop-in program only during finals or midterm week. According to Peel et al. (2023), being around therapy dogs during a stressful period generally improved people's mood. The researchers showed how a simple program to promote health might assist in creating an environment that is more conducive to students' overall well-being. Both studies supported the effectiveness of AAI programs at universities and showed them to be beneficial in promoting wellness in students.

Robino et al. (2021) found that AAI reduces stress and improves health outcomes for college students. Participants were encouraged to attend "Study Break sessions" where they would be able to spend time with different animals: one rabbit, one bird, and two dogs (Robino et al., 2021). Robino et al. found that interacting with the different animals caused a significant difference in positive affect which includes a person's level of enthusiasm, activity, and alertness. There was also a reduction of negative affect which displays a variety of adverse mood states that may be caused by perceived stress and negative involvement—this reduction in negative affect resulted in decreased stress levels (Robino et al., 2021). House et al. (2018) found similar results with an AAI program in which students were able to interact with therapy dogs. A total of 85% of students indicated that the experience afforded them stress relief.

In a study by Wood et al. (2018), 131 students from a university's counseling service pet therapy event were recruited to participate in an AAI study for students who experience stress. A 15-minute intervention was followed by a State-Trait Anxiety



Inventory measurement and blood pressure measurement (Wood et al. 2018). The intervention included interactions with a dog that produced measurable reductions in stress levels among the students. All participants showed statistically significant reductions in their systolic and diastolic blood pressure, as well as their state anxiety, which was the most significant in addition to a more statistically significant reduction of their state anxiety levels. A State-Trait Anxiety Inventory questionnaire was completed by the participants, and their blood pressure was taken before and after they interacted with the therapy dog. Furthermore, this study demonstrated that spending time with dogs reduced both perceived stress and biological markers of stress even with a time-limited intervention (Wood et al., 2018). To achieve optimal results, cortisol levels were measured approximately 45 minutes after intervention (Wood et al., 2018). Cortisol can be used as a more direct indicator of stress. As a result of all measures, stress levels decreased significantly immediately following the intervention. These results indicate that AAI is an effective way to deliver stress management to groups. Taking a lab practical is stress-inducing and causes anxiety. Williams, Dagnan, et al. (2018) looked at the stress levels first-year Doctor of Physical Therapy students experienced before taking a laboratory practical exam. The intervention, which either included a therapy dog or no therapy dog, was performed before the exam and was found to decrease anxiety scores and stress levels.

### **Remaining Gap in Evidence**

According to Binfet et al. (2018), there is limited research outlining the process and challenges of setting up an AAI program. The effect of single versus multiple sessions on students' well-being may also be examined. It would be helpful to investigate

the effects of AAI compared to traditional therapy (Binfet et al., 2018). In future studies, it will be a necessity to vary the frequency of human–animal interactions to determine if the number of sessions relates to participant well-being (Robino et al., 2021).

Furthermore, confounding variables and bias may need to be considered. Additionally, Kivlen et al. (2022) identified a gap in knowledge regarding graduate students. They found that current research focuses mostly on undergraduates and the younger population.

### **The Argument About the Clinical Significance of the Evidence**

There is strong evidence supporting the integration of AAI into therapy and education (Binfet et al., 2018; Robino et al., 2021; Kivlen et al., 2022). Research reveals a pattern of stress reduction among college students upon exposure to therapy dogs or other types of animals. Psychosocial factors such as emotional disturbances, learning disabilities, and social-emotional competence were met with notable improvement over time. However, studies are mixed on the effectiveness of AAI as an independent form of therapy. Flynn et al. (2020) suggest that AAI would be most beneficial as an adjunct to traditional therapy. According to the AOTA (2020), people should be able not only to operate but also to be comfortable within their unique contexts to achieve full participation, meaning, and purpose. With the help of AAI, individuals in higher-level education will be able to engage in their occupations at their highest level of functioning. AAI may also teach these individuals to adapt to their environments and performance. OTPs will benefit from this information if they want to set up programs in other settings.

### **Statement of Purpose, Hypothesis, and Research Questions**

Our study aims to assess OT students' perceptions of the use of AAI in reducing stress and improving overall well-being, as well as assess student preferences for specific AAI programming. We gathered information regarding the feasibility of establishing an AAI program in higher education settings, particularly within OT programs. We are expecting to find that OT students have perceptions that AAI can promote their well-being. It was expected to find that the creation of an AAI program in an educational setting for OT students would present challenges but is feasible.

### **Framework**

The primary focus of the Ecology of Human Performance model is on the interdependent relationship between individuals and their environment, and how this relationship impacts human performance (Dunn et al., 1994). The fundamental assumption of this model is that an individual's performance and behavior are affected by their interaction with the context surrounding them (Dunn et al., 1994). This framework is relevant to AAI because it emphasizes the importance of understanding the individual's physical, emotional, and social contexts, as well as the characteristics of the animal, to promote positive outcomes.

Several components comprise the theoretical framework of the Ecology of Human Performance model. One major component is the “person.” This aspect focuses on one's ability to attach meaning and purpose to tasks while engaging in specific contexts which, in turn, contributes to performance (Cole & Tufano, 2020). In the case of AAI, the person engaging with therapy animals may attach themes of comfort and companionship to the task at hand. As a result, the person develops a sense of purpose from engaging in the

AAI task. This acquired purpose drives their motivation to perform in other occupations (Cole & Tufano, 2020).

There are five therapeutic intervention strategies presented by the OTPF-4: establish/restore, maintain, modify, prevent, and create/promote (AOTA, 2020). The establish/restore intervention strategy is used when the aim is to restore function by improving skills and abilities. This is relevant to AAI because this strategy involves working with the person to improve their mental and emotional well-being after an interaction with the animal. The second therapeutic intervention strategy is to modify. Modifying may involve adjusting the setting to create a more calming environment for the person and the animal. This could include using music or alternating between indoor and outdoor spaces. The third intervention is maintenance, which was created to offer clients support that will help them preserve the performance abilities they have regained and continue to meet their occupational needs (AOTA, 2020). The OTP can use an adaptive device to make it easier for a person to interact with the animal. In AAI, this can involve identifying potential safety concerns and developing protocols to minimize the risk of injury or negative outcomes. Lastly, creation involves the circumstances being promoted to more adaptable or complex performances within context (AOTA, 2020). In AAI, this can involve designing activities that are enjoyable and engaging for both the person and the animal, such as going on walks or playing a game. Additionally, creating activities that offer the animal an opportunity to express natural behaviors, such as providing enrichment, can add a level of stimulation. This can help keep the animal engaged and can also provide an opportunity for the person to form a bond with the animal.

By engaging in activities together, the individual and the animal can form a connection. Building this relationship can offer positive reinforcement to the participant in the form of friendship and unconditional support (Ávila-Álvarez et al., 2020). An OTP can then use AAI to provide individualized therapeutic goals and aid in building a meaningful relationship between the participant and the therapy animal. The relationship with the animal can help the individual reach their therapeutic goals and promote positive change. AAI in an OT program falls under the OTPF-4's health promotion interventions (AOTA, 2020). This intervention approach enhances performance for all people with or without disabilities in the natural contexts of life. Therapy animal interaction can be administered by an OTP and designed to benefit individuals, groups, or entire populations. Once the individual or group has developed trust and confidence within their environment, improvements in stress management, communication, and decision-making can be achieved. Since student outcomes involve a reduction of stress and other negative states, AAI in an OT program may also be categorized as a preventative intervention under the OTPF-4 (AOTA, 2020).

### **Methodology**

A mixed-method approach was used to explore and investigate the potential benefits of AAI for OT students. We conducted semi-structured interviews with professionals who have experience setting up AAI programs, to gain insight into the experiences of creating an AAI program. Surveys were also administered to OT students to collect their perceptions of AAI and associated benefits. By utilizing a mixed-method approach, quantitative and qualitative data from the surveys can provide statistical backing and justification for anecdotal findings from the interviews.

**Participants**

For this survey component of our study, participants were recruited from the Association of Animal-Assisted Intervention Professionals (AAAIP) and private and public Facebook groups. Although we aimed for a sample size of 12 participants, we were only able to recruit five AAI professionals. Semi-structured interviews took place via Zoom online teleconferencing tool (<https://zoom.us/>) for 15-30 minutes. Inclusion criteria for the interviewees included experience with creating or implementing AAI programs before the interview. For the survey component, 38 OT students were recruited through online Facebook groups for current occupational therapy students and new graduates. Surveys included one consent question, five multiple-choice, and five open-ended questions. The survey and interview questions were approved by the Stanbridge University Institutional Review Board (IRB).

**Instrumentation**

We developed a survey to measure student perceptions of AAI programs about stress levels and mood changes with the guidance of research in the field on the related topic. Student perceptions of the effects of AAI on stress levels and well-being will support the need, or lack thereof, for the implementation of AAI programs in educational settings. The surveys consisted of five multiple-choice questions and five open-ended questions. The survey aimed to gather information about their prior experience with therapy animals and their perceptions of whether having therapy animals can enhance their academic performance and mood. During the coding process, “parent” and “child” codes were generated to determine emerging general themes and subthemes. Furthermore, we conducted Zoom interviews with five AAI professionals to gain insight

into their opinions and experiences with implementing AAI programs. Data generated from qualitative questions in the survey and interviews were cross-referenced to isolate recurring themes between expected benefits (as told by AAI professionals), and the perceptions of the student who participated in AAI. By comparing expected benefits with student perceptions, we can identify discrepancies and understand how to improve the overall effectiveness of AAI programs.

### **Procedures**

This study began by obtaining Stanbridge University IRB approval to ensure compliance with ethical guidelines. After being approved, informed consent was obtained from all participants. Participants were assured that their answers would be kept confidential and used solely for research purposes. During the research period, surveys were distributed to recent graduates, OT students, and OT assistant students enrolled in OT programs. We also conducted semi-structured interviews with AAI professionals and transcribed for data analysis to detect relevant or recurring themes related to AAI program implementation processes. Upon data collection, the responses were coded using the software Dedoose (<https://www.dedoose.com/>). Coding on Dedoose ensured that the data collected was organized and easy to interpret, allowing the research to produce meaningful conclusions.

### **Data Analysis**

The objective of this study was to examine OT students' perceived benefits of AAI on stress levels and overall well-being. To minimize risk to the students, the surveys were completely anonymous. To identify common themes among participant responses, the research team utilized the analysis software Dedoose for answers obtained from open-

ended questions. For interview analysis, two of us participated in coding each of the interviews separately and finalizing the themes and subcategories together to ensure inter-coder reliability. In addition, the two of us who were involved in coding an interview were not involved in the data collection process of that interview. This measure aids in ensuring transparency and minimizing bias (Cofie et al., 2022). The coding process involved examining each word or phrase to identify patterns and common characteristics. The identified themes were used to construct an overall interpretation of the data. As for the quantitative data, the information was provided by Google Forms.

### **Ethical and Legal Considerations**

Participation in the study was voluntary and participants were able to withdraw from research at any point in time for any reason without penalty. Participants who were eligible for research were given a consent form that covered participation, benefits, risks, confidentiality, and contact information. Students recruited through Facebook were not asked for any identifying information to uphold confidentiality through being anonymous. The survey was conducted using a Google Form and by hitting “I consent to participate in this survey” participants consented to participation in the study. For the interviews, we utilized a Google Form to collect the email addresses and consent of participation of the professionals. Before beginning the interviews, the participants were asked to sign a video/photo release form. There were no harmful physical risks involved. To minimize risks associated with participation in the study, we ensured that participants were clear about our purpose, used inclusive language, and focused on objective information.



This study involved confidential surveys, and all data collected will be securely stored for three years after the study's completion, as per federal regulations under 45 CFR 46.115 (Protection of Human Subjects, 2023, para. 115). To ensure data security, the email accounts used for the surveys and scheduling of the interviews are password protected. Furthermore, participant information for those who participated in the interviews was anonymized using pseudonyms during the interview process. After transcription, the original data was deleted to maintain confidentiality. The Zoom recordings were stored on the computer instead of the cloud and were promptly deleted after transcription. The principal investigator did not access the recordings directly but only reviewed the transcriptions after pseudonyms had been applied.

## **Results**

### **Interview Results**

A total of five interviews were conducted over Zoom, ranging from 30-60 minutes. Interviewees were given the following pseudonyms: “Jean Covey,” “New Jeans,” “Cindy,” “Titan,” and “Katniss.”

#### ***Theme 1: Benefits of the Human-Animal Bond on Both Student and Staff Well-Being***

Participants were asked what some benefits of AAI in an educational setting were. Several of the participants reported positive outcomes on student/staff well-being, as seen in Table 1. For example, improved communication, decreased stress, enhanced motivation, and positive mood were frequently reported. One participant even reported that AAI at school improved student attendance; “They participated more fully when the dog was present, and I would say they were more excited to come to class. Attendance

was better." One of the participants reported that by breaking down communication barriers, team-building skills, and activities could be enhanced.

Many participants found that AAI decreases stress while also increasing positive feelings. Jean Covey stated that the children she works with are "much more confident" and "their whole body relaxes" when they are with the therapy dog. Additionally, several interviewees described the therapy animals as motivating the student. New Jeans found that her students and staff are "more engaged and willing to come to school." Several of the participants also explained that interacting with animals is important not only to students but also to educators and other staff. Titan reported that "employees are now happy to be at their job for the day and this is the best day of their entire week." It was reported that having the animals was comforting to the staff, increased engagement, and brought a sense of joy.

### ***Theme 2: While Feasible, Challenges Exist***

We found that implementing an AAI program comes with many benefits to students, patients, and staff. Participants reported some common difficulties that they faced which can be seen in Table 2. As the handler, it is important to prioritize the animal's welfare. New Jeans reported that she ensures that the therapy animal feels well before leaving the house. Jean Covey has about 60 students on her caseload and Katniss stated she had a "big caseload" as well. To protect the animal, the handlers discussed allowing the animal to have retreat spaces or time limits for the animals.

Many obstacles arose during the interviews. We discussed how students are prone to being allergic or fearful of the animal. Titan discussed how the pandemic forced her to close her non-profit organization dedicated to bringing mini therapy horses to schools,

nursing homes, and other locations in the community. Titan, as well as other participants, also described the difficulty finding support from the right people. However, that was not the case for many of our participants like Cindy. Cindy stated one of the challenges was having to advocate for AAI because “some parents were concerned because they knew their student had significant behavioral outbursts.” Cindy reported how important it is to “feel confident in your abilities going into the situation because you never know what you're going to run up against.”

***Theme 3: AAI Professionals Must Educate Themselves and Others for Successful Implementation***

While there is current research that outlines the best practice recommendations for AAI, our five participants agreed that having sufficient knowledge to successfully prepare for implementation is required. Our data in Table 3 shows that being qualified, trained, and certified to handle the animal is an important aspect of AAI. Katniss stated that “it shouldn’t just be bringing your pet dog into school” and that the practitioner should be experienced and effective in their job before they bring in an animal.

Being educated on animal behavior and well-being was discussed throughout the interviews as another part of the best practices for AAI. Jean Covey reported that not only is she aware of what the therapy animal needs, but she also educated her students to notice the cues. The handlers teach their students the safety guidelines for the animals and how to handle the animal which includes not feeding or poking their nose.

***Theme 4: Opportunities for Occupational Engagement (Activities in AAI)***

By incorporating an animal into an educational setting, the handler allows for the student to engage in many occupations with the therapy animal as seen in Table 4. In

addition to what has been already mentioned, the handlers taught the students to be safe around dogs and encouraged them to learn about social interactions and caring for others. In a therapy session patients can work on ADLs like dressing, exercising, and grooming, both of which look different on a therapy animal. Katniss used fasteners in preparation for dressing ADL tasks. Jean Covey, Titan, and Cindy used to brush the animal as an occupation. Cindy reported that a student of hers was able to “carry over some of the [grooming] skills onto himself and was able to better maintain his own hygiene.” Students were able to engage in play/leisure occupations like being outside, playing scavenger hunts, and doing puzzles. Cindy incorporated the therapy dog to increase social interaction by having a student who was going through a difficult time writing an email about how he was feeling to the therapy dog. Five participants reported that having the AAI program offered opportunities for learning about what AAI is. For example, Jean Covey explained that many people don't know the differences between service animals and therapy animals Jean Covey stated that she wanted to get better at practicing explaining this to others. Titan explained that when they visit schools, they give presentations on "what we do, why we do it, how we get here, why it's important, and then they get to interact with the horse.”

### ***Theme 5: Implementation Across Settings and Populations***

Table 5 shows the participant's settings, and the populations they engaged with are seen. Participants ranged from OT, speech therapist, instructional assistant, equine therapist, and school based. The participants worked with a range of students and patients who had autism, emotional disturbances, suffered from stress, and dementia. Titan

reported that she has “not found an age, gender, ethnicity, sexual orientation, socioeconomic class that's not benefiting [from AAI].”

## **Survey Results**

### ***Quantitative Data:***

When students were asked about their perceptions on whether interacting with animals on campus could improve their overall academic performance, 86.6% of participants responded “yes” (Figure 1). When asked if they believe that having therapy animals on campus can help improve their mood, 97.4% of participants responded “yes” (Figure 2). Participants were asked if they have interacted with therapy animals at school, to which 60.5% of students responded “no” (Figure 3). Of the 38 students when asked how often they preferred to interact with therapy animals on campus, 50% of students responded “weekly,” 23.7% of students responded, “daily,” 15.8% of students responded “monthly,” and 10.5% responded “once a term” (Figure 4). When students were asked when they would prefer to interact with therapy animals, 76.3% responded “before exams,” 10.5% responded with “after exams,” 7.9% responded with “the week before exam,” and the remaining 5.3% gave other answers (Figure 5).

### ***Qualitative Data:***

#### **Theme 1: Improved student well-being.**

***Subtheme 1: AAI may decrease stress.*** Students frequently emphasized the role of AAI in decreasing stress. For many students, finals week brings high levels of stress and anxiety, which can interfere with productivity and ability to focus. Interacting with animals was said to “reduce stress,” “decrease anxiety,” and “decrease overwhelming

feelings” as seen in Table 6. Many students appreciated the opportunity to forget about their school-related stress momentarily before returning to their studies.

***Subtheme 2: AAI may increase feelings of relaxation.*** Much like decreased stress, relaxation because of animal interaction was a popular subtheme among student responses as seen in Table 6. Most commonly, students described AAI as providing a sense of “calm.” Students claimed that animal interactions calmed their nerves before exams, which could potentially improve exam performance. Feelings of being “calm” replaced stress and test anxiety. In addition, animal interactions such as hugs and kisses from dogs made students feel “relieved.” Other aspects of relaxation induced by animal interactions included the provision of desirable tactile “sensory input.”

***Subtheme 3: AAI may increase feelings of happiness.*** Increased feelings of happiness were among the most common sub-themes that emerged from survey responses. In Table 6 it is seen that students associated therapy animal interactions with feeling “happier” and “cheered up,” experiencing a “better mood,” and experiencing overall “positive emotions.” Increased feelings of happiness gave many students something to look forward to during more academically demanding weeks.

***Subtheme 4: AAI may improve motivation.*** In Table 6, it is seen that increased motivation was a trending subtheme among responses. Specifically, many students felt that interacting with therapy animals helped them become more “present in the moment.” Students associated this temporary respite from their day-to-day stressors with a subsequent increase in motivation to participate in school-related tasks. Interactions with therapy animals were also described as “uplifting,” particularly during study breaks.

**Theme 2: Different activities with and without AAI to decrease stress.**

***Subtheme 1: Relaxation strategies students currently engage in.*** Current relaxation strategies used before taking exams varied among students as seen in Table 7. The leading code that emerged from this subtheme was “breathing.” Students practiced deep breathing and other techniques to address elevated stress levels. “Music” and “rest” followed in popularity. Students who specified forms of rest mentioned sleeping, napping, and meditation. “Exercise” and “affirmations” were the next set of prominent strategies. Finally, some students chose “prayer” and “treating” themselves to a preferred food as their relaxation strategy of choice.

***Subtheme 2: Preferred Activities for AAI.*** Among the sub-themes that emerged from the survey responses were the preferred activities that students experienced during AAI, in Table 7. “Petting” was one of the most therapeutic activities that students preferred to engage in with animals on campus. An equally popular activity was “play.” Although some responses referred to playing in general, others named catch, fetch, and frisbee as examples of ways to play with animals on campus. Other preferred activities according to survey responses were “feeding” and “grooming.”

**Discussion**

The results provide insight into both how an AAI program is developed in an educational setting as well as how OT students view AAI. The “AOTA Vision 2025” outlines core principles for services, emphasizing accessibility, collaboration, effectiveness, and leadership (AOTA, 2017). Because AAI has been shown to be effective across various populations and settings, there is a strong likelihood that it can also prove to be effective in higher education environments. By exploring the feasibility

of introducing AAI programs in higher education, graduate students could gain valuable access to AAI services. This initiative would necessitate close collaboration between OT and various stakeholders, including teachers, students, their families, and faculty members. Such collaboration is essential for producing optimal outcomes for higher education students and would reduce some of the challenges described in the second theme of the interviews (Table 2). Moreover, this endeavor would empower occupational therapists to assume leadership roles in creating positive changes within complex educational systems, including reforming and enhancing them.

According to Lewis-Kipkulei et al. (2021), occupational therapy programs are rigorous and demanding to ensure that students are competent enough to uphold evidence-based care to their patients. Higher education, like OT education, can intensify student stress. Pfeifer et al. (2008) found that 66.4% of OT students rated the time during their OT education as the highest period of stress in their lives. During this time, students feel overloaded, are unclear about what is expected of them in their courses and are worried about their future. In our study we found that some OT students engage in stress-relieving activities like listening to music, meditating, and exercising. Although contact with therapy animals was perceived as a sought-after service, most students did not name contact with animals as a go-to coping mechanism. This may be due to limited access to therapy animals, which further urges the need for AAI program implementation in educational settings. As seen in Table 6, students reported that AAI would decrease stress as well as increase feelings of relaxation. Previous research has suggested that AAI may increase feelings of relaxation and relieve stress (Johnson et al., 2023; Williams, Emond, et al., 2018; Binfet et al., 2018). However, the students (60.5%) did not interact with



therapy animals at school. According to Cooke et al. (2023), having access to AAI on campus may provide relief from stress and anxiety for university students. However, Grove et al. (2021) concluded that various challenges may interfere with AAI program implementation in educational settings including high workload, lack of guidelines for the implementation process, lack of support from the school community, and the lack of understanding associated with the role of a therapy dog.

The available literature on AAI has a clear overarching message: interventions incorporating animals provide significant benefits to individuals leading high-stress lives or conditions that may cause emotional dysregulation (Williams, Emond, et al., 2018; Binfet et al., 2018). These findings have the potential for generalization to many groups and demographics—the backgrounds of the AAI professionals that were interviewed varied. As table 5 shows, the participants discussed that all populations benefit from AAI. When the survey participants were asked if they believed that interacting with therapy animals could improve their overall academic performance and if having therapy animals on campus could improve their mood, the majority answered “yes.” Having AAI in the educational setting also provides the students with learning opportunities. Jean Covey mentioned that having dogs in the school allows the students to learn how to treat and handle dogs. For OT students, the incorporation of AAI activities in their education would allow them to gain knowledge and insight into how beneficial AAI is to not only themselves as students but their future patients as well.

The OT Research Agenda lists several main categories and priorities for occupational therapy, including “research training” (AOTF & AOTA, 2011). This includes two major research goals with which our study aligned: “Expand OT's

knowledge and skills in using population-based research for prevention and promotion of occupation” and “Socialize occupational therapy educators to prepare occupational therapy scientists” (AOTF & AOTA, 2011). In our research, we addressed the mental health, which includes well-being and stress, of OT students. It is important to confront the stressors a student feels and prevent them from worsening by promoting healthy coping strategies, especially when in an OT program. This will prevent students from experiencing occupational deprivation and/or imbalance. Lewis-Kipkulei et al. (2021) discussed the importance of OT student educators and programs implementing activities to facilitate well-being. By doing so, the program is allowing the students to have greater opportunities for occupational engagement.

Research on AAI in educational settings continues to grow. Our study parallels previous studies exploring the potential benefits of AAI, particularly in reducing stress and promoting well-being (Ward-Griffin et al., 2018; Kivlen et al., 2022). These findings resonate with broader research indicating that AAI can have a positive impact on individuals facing high-stress situations or emotional challenges. Our highlights the positive responses of students and stakeholders toward the introduction of therapy animals on campus. This suggests a generalizable trend of improved academic performance and mood enhancement. Students perceived that AAI interventions can benefit various demographic groups. The emphasis on collaboration between occupational therapists and diverse stakeholders reflects the principles of accessibility, collaboration, and effectiveness outlined in the “AOTA Vision 2025” (AOTA, 2017). Overall, our research contributes to the ongoing dialogue about the potential of AAI to enhance well-being and reduce stress in educational settings. Findings from survey data

closely mirror results from Cooke et al. (2021), which emphasized stress relief as a major student outcome of AAI.

Through our survey responses, it is evident that students have a strong desire for an AAI program at their school. Approximately 50% of students indicated a preference for weekly AAI sessions, highlighting the importance of regular interactions with therapy animals. Additionally, 23.7% of students favor daily AAI sessions, demonstrating a clear demand for frequent engagement with therapy dogs. Most students believe that engaging with a therapy animal would positively impact their academics. This data supports the idea that integrating AAI into the school environment regularly can effectively contribute to stress reduction, relaxation, and overall well-being among students.

### **Study Limitations**

Our study had some limitations that should be acknowledged. Firstly, the small sample size might limit the generalizability to all OT students. Students who like animals may have been more inclined to fill out the survey rather than students who do not. Additionally, the study may have been constrained by limited time and duration to observe the full extent of therapeutic effects arising from the interaction between the participants and the animals, which limits the sample sizes. Another potential limitation may include the risk of biases due to small sample sizes. These limitations should be taken into consideration when interpreting the results. By being mindful of these limitations and taking appropriate measures, therapists and professionals can ensure the safe and responsible integration of animals into therapy sessions, maximizing the benefits of AAI for the participants involved.

When integrating animals into therapy sessions, certain limitations come into play. One limitation may be if a client is allergic to the animals. Clients who have allergies or asthma might not be suited for AAI because of the health risks involved, which could decrease the benefits of having a therapy animal (Kurtz, 2008). Another limitation is that some clients might display aggressive behaviors, posing a risk of injury or illness to the therapy animal, therapist, or others present during the session. In such cases, AAI may not be an ideal intervention (Kurtz, 2008).

Moreover, therapy animals need to undergo special training, health screenings, and licensing to become certified to work in therapy sessions with people. While this process ensures the best care for the clients (Kurtz, 2008), it also reduces the number of available therapy animals. These limitations can contribute to the challenges associated with setting up an AAI program in an educational setting.

As discussed in the literature review, the use of AAI can be beneficial for college students for several reasons. However, including a live animal in interventions can pose some challenges. According to the AAAP Code of Ethics #4, AAI practitioners must treat everyone involved including the “animals, people, and environment with respect, dignity, and sensitivity, maintaining the quality of life and experience for all who are involved” (Pet Partners, 2021). According to Chastain-Griffin et al. (2021), some barriers include concerns for infection control, legal considerations due to lack of clarity in the laws that are in place, protection of the animal, insurance coverage, and lack of resources.

Practitioners implementing AAI should consider the well-being of clients who may have a fear of animals, concerns about contamination, or a higher risk of zoonotic

illnesses, parasitic diseases, bite injuries, or accidents (Meers et al., 2022). Fear of the animals can be addressed in AAI. However, the possibility of escalation into a dangerous situation exists. It is also important that the animals and handlers involved in the interventions are properly trained and certified by an animal therapy organization. This can minimize the risk of any dangerous situations involving animals (Carpenter, 2018).

Beneficence is defined as an act of charity, mercy, and kindness that involves doing good to others and upholding moral obligations (Kinsinger, 2009). In a professional-client relationship, the professional is obligated to prioritize the well-being and interests of the client. Chastain-Griffin et al. (2021) state that in AAI, it is crucial to protect the well-being of therapy animals not just for their sake, but also for the clients they serve. Professionals should minimize any risks associated with the intervention by developing AAI protocols. With established protocols, professionals can select appropriate clients, plan treatment options, and evaluate the effectiveness of their work with therapy animals.

### **Conclusion**

Overall, the participants who were interviewed for AAI in educational settings highlight the substantial benefits of the human-animal bond, including enhanced communication, reduced stress, increased motivation, and positive mood among students and staff. However, the interviews also illuminate the challenges of AAI, such as addressing allergies and fears, securing support, and advocating for AAI. Qualified handlers and students who are educated on responsible animal interactions are paramount to ensuring successful implementation. AAI's versatility is evident in its applicability across diverse populations and settings, emphasizing its inclusivity and adaptability.

Ensuring that handlers are properly trained and certified is crucial, as proper handling of animals is essential for the safety and comfort of the student. We discovered that AAI is beneficial across a range of people and contexts, and there is a significant likelihood that it will succeed in settings related to higher education as well, in keeping with the “AOTA Vision 2025” (AOTA, 2017). In the future, our research can influence OT programs to create AAI programs for their students which will allow for lower stress levels and overall improve well-being. Our research will also allow OT programs to understand what some of the challenges are as well as how to be prepared for the implementation of an AAI program.

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**Table 1***Benefits of the Human-Animal Bond for Both Student and Staff Well-Being*

Category	Codes
AAI improves social interaction	Breaking down communication barriers, improving communication, self-awareness, emotional regulation, therapeutic relationships, animals' ability to sense emotions, enhancing therapeutic relationships
AAI decreases stress	Reduced stress, relaxed, sensory input, improved behavior, coping
AAI increases positive feelings	Mood, awesome, endless benefits, biopsychosocial benefits, happiness, positive energy, positive memories, like magic, helps both patient and therapist, engagement, excited, positive memories
AAI is motivational	Attendance, motivation to continue, motivated, goal achievement, attendance, motivation, focused, engage

*Note:* Table 1 describes the first theme that emerged from the qualitative responses of the AAI professional interviews.

**Table 2***While Feasible, Challenges Exist*

Category	Codes
There are obstacles in AAI	Fear, lack of funds, allergies, unsupported, apprehension, pandemic impacting access, allergies; multi-tasking therapist/educator and dog handler, takes more time, support from the right people, complexities, unpredictability, danger, being prepared for unpredictability, back up plans, traveling to people, interacting appropriately with the animal, insurance.
Animal welfare must be prioritized	Managing large body of students, number of dogs for number of students, animal welfare, a lot of students: requiring multiple animals, group setting, crowding, advocating for the animal, time limits for animal, retreat spaces

*Note:* Table 2 describes the second theme that emerged from the qualitative responses of the AAI professional interviews.

**Table 3***Education and training in AAI*

Category	Codes
Having sufficient knowledge required to successfully prepare for implementation	Qualified, certified, skilled, support, prior approval, needing to follow standards/protocols, needs assessment/individual considerations for setting, experience in role before adding animal, trained, boundary setting, what goes in it, resources, education, research, buy in guidelines, need for professional and respectful protocol for implementation, student considerations, grants
Education on animal behavior and well-being for all involved	Learning how to pet the dog appropriately, teaching how to interact with the dog, dog behavior/training, not bringing the dog in when their sick or hurt, educate all involved

*Note:* Table 3 describes the third theme that emerged from the qualitative responses of the AAI professional interviews.



**Table 4***Opportunities for Occupational Engagement (Activities in AAI)*

Category	Codes
ADLs	ADLs, dressing, grooming, hygiene, motor, exercise, brushing, hugging, being outside, walking
Play/leisure	Being outside, hugging, scavenger hunts, puzzles, social interaction, scavenger hunts, social learning, puzzles, storytelling, writing emails to the dog as a coping strategy, throw the dog toys
Social interaction	Writing emails to do the dog, storytelling
Education	Education about animals: service dog, facility dog, teaching others about the power of the HAB, social learning opportunities, education about caring for self and others, earning

*Note:* Table 4 describes the fourth theme that emerged from the qualitative responses of the AAI professional interviews.

**Table 5***Implementation Across Settings and Populations*

Category	Codes
Settings	OT, equine, instructional assistant, school based, SLP, education about AAI, all populations benefit, staff benefit, biopsychosocial benefits, individual/group, dogs, horses, dogs the most common, every facility should have a dog, libraries, nursing homes
Populations	autism, emotional disturbances, stress, dementia, “we've not found an age, a gender, an ethnicity, sexual orientation, socioeconomic class that's not benefiting”

*Note:* Table 5 describes the fifth theme that emerged from the qualitative responses of the AAI professional interviews.

**Table 6***Theme 1: Improved student well-being.*

Category	Codes
AAI may increase relaxation.	Sensory input, calm, relieved
AAI may decrease stress.	Reduced stress, decreased anxiety, decreased overwhelming feelings
AAI may increase feelings of happiness.	Cheered up, better mood, positive emotions, happier
AAI may improve motivation.	Present in moment, uplifting

*Note:* Table 6 describes the first theme that emerged from the qualitative responses of the student survey.

**Table 7**

*Theme 2: Different activities with and without AAI to decrease stress.*

Category	Codes
Relation strategies students currently engage in.	Music, breathing, affirmations, exercise, rest, treats, pray
Preferred activities for AAI	Play, feeding, petting, grooming

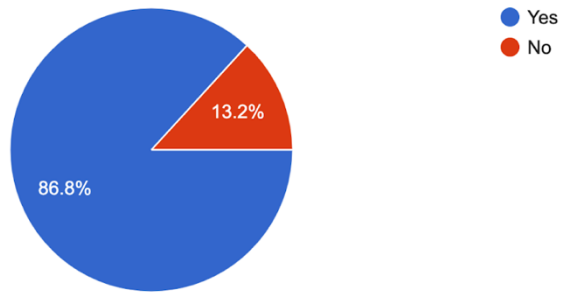
*Note:* Table 7 describes the second theme that emerged from the qualitative responses of the student survey.

**Figure 1**

*AAI Improving Academic Performance*

1. Do you believe that interacting with animals on campus could improve your overall academic performance?

38 responses

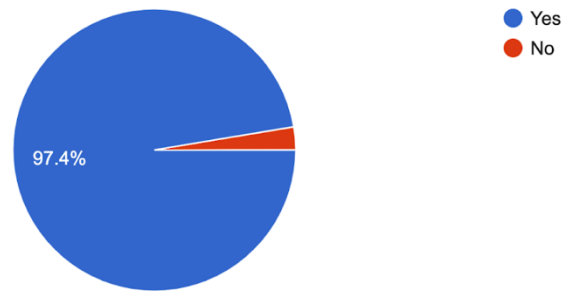


**Figure 2**

*AAI Improving Mood*

2. Do you believe that having therapy animals on campus can help improve your mood?

38 responses

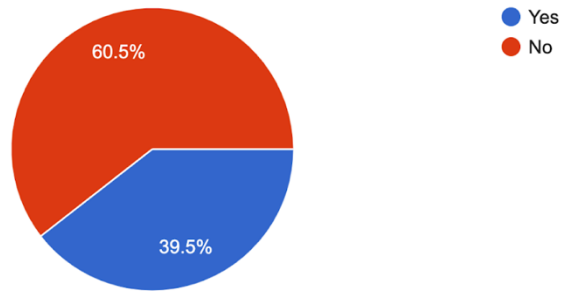


**Figure 3**

*Interaction with Therapy Animals at School*

3. Have you interacted with therapy animals at your school?

38 responses

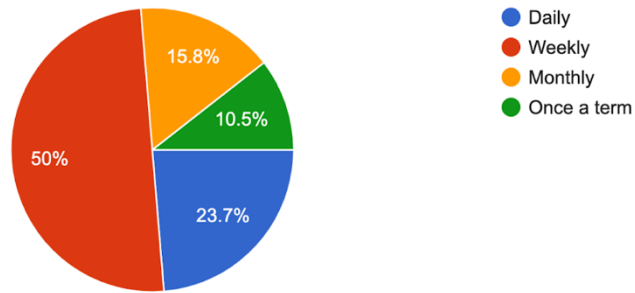


**Figure 4**

*Frequency of Interaction*

9. How often would you prefer to interact with therapy animals on campus?

38 responses



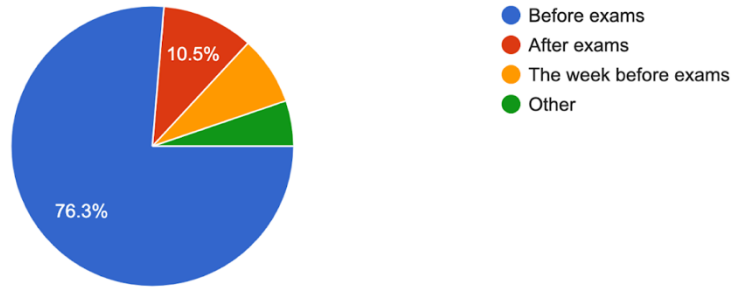


**Figure 5**

*Activities with Therapy Animals*

10. When would you prefer to interact with therapy animals?

38 responses



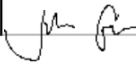
## Appendix

### Institutional Review Board Approval

This is a screenshot of our IRB approval for our research study.

Dear Dr. Macy Burr and Students,

The Stanbridge University Institutional Review Board has completed the review of your application entitled "Animal-Assisted Interventions in Occupational Therapy Education." Your application (#12MSOT012) is approved and categorized as Expedited.

IRB Application Number	#12MSOT012
Date	08/17/2023
Level of Review	<b>Expedited</b>
Application Approved	X
Conditional Approval	
Disapproved	
Comments	The requested Minor changes have been reviewed and confirmed as completed by the IRB. (08/17/2023)
Signature of IRB Chair	

**Please note that any anticipated changes to this approved protocol requires submission of an IRB Modification application with IRB approval confirmed prior to their implementation.**

Sincerely,  
Julie Grace, M.S., M.A.  
IRB Chair