

ROBOTIC ANIMAL-ASSISTED THERAPY: IMPROVING INDIVIDUALS'
QUALITY OF LIFE

A Thesis submitted 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 *Robotic Animal-Assisted Therapy: Improving Individuals' Quality of Life* by Jordan Buntich, Marissa Gonzalez, Stephanie Miranda, and Tuyen Vu, 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.

A handwritten signature in black ink that reads "Macy Burr". The signature is written in a cursive, flowing style.

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Abstract

Animal-assisted therapy (AAT) is an intervention strategy that assists clients in increasing their physical capabilities and interactions within their social environment (Kerulo et al., 2020). AAT has been shown to be a beneficial intervention for individuals with developmental disabilities. However, studies have suggested concerns in implementing AAT such as the welfare of therapy animals, proper certification of handlers, lack of standardization in occupational therapy (OT) practice, and limited accessibility. This study is aimed at understanding whether robotic animal-assisted therapy (RAAT) can be a beneficial preparatory intervention or suitable replacement when AAT is not a viable option. Professionals from the Association of Animal-Assisted Intervention Professionals (AAAIP) were recruited, along with members from multiple AAT private and public Facebook groups. Participants completed an anonymous online semi-structured survey via SurveyMonkey, a platform for collecting data, with questions regarding consent, level of education, experience with RAAT, barriers with therapy animals, and AAT standardization. Of the 15 participants, 14 met the inclusion criteria and filled out the survey. The data collected was analyzed using Dedoose software to identify common themes in qualitative responses. The results of this study provide various perspectives from professionals in different settings on the benefits of AAT, current Animal-Assisted Intervention International (AII) standard regulation, and the implication for the utilization of RAAT. The data indicated that although the majority of the participants have not incorporated RAAT into practice, the participants believed that RAAT can be an alternative or preparatory intervention when interaction with live

animals is not possible. The data collected further contribute to an emerging niche setting.

Key Words: animal-assisted therapy (AAT), robotic animal-assisted therapy (RAAT), Animal-Assisted Interventions International (AAII), animal-assisted intervention practitioners (AAIP), Association of Animal-Assisted Intervention Practitioners (AAAIP), occupational therapy (OT), occupational therapy practitioners (OTPs), fine motor skills, gross motor skills, social skills, developmental disabilities

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Robotic Animal Assisted Therapy: Improving Individuals' Quality of Life

Animals are an integral part of human society, in which they are commonly viewed as companions, and contribute to the physical, social, and emotional roles of children (Garoma & Diba, 2022). In recent decades, animal companionship has found its way into the healthcare sector, specifically in the field of rehabilitation. Animal-assisted therapy (AAT) is a form of intervention that includes animals in therapy to increase the motor, social, behavioral, and mental functioning of patients (Kerulo et al., 2020). Although AAT is a relatively new field, it has drastically gained momentum in popularity within a short time frame (Serpell et al., 2010). AAT is delivered by specialized professionals such as psychologists, occupational therapists, physical therapists, and social workers.

Occupational therapy practitioners (OTPs) work with people across their lifespan to help them become as independent as possible in their daily life through the use of meaningful activities. OTPs can incorporate animals in planned and measurable intervention activities to increase quality of life by focusing on client-centered goals (Winkle & Ni, 2019). Due to the influx of practitioners wanting to incorporate AAT into practice, there can be a lack of standardization, especially within occupational therapy (OT). Most curricula do not incorporate AAT in their program and there is currently no formal certification from the National Boards for Certification in Occupational Therapy for OTPs. Currently, Animal Assisted Intervention International (AAII) is the main organization that offers accreditations and education for animal-assisted intervention practitioners. Pet Partners has also recently created the Association of Animal-Assisted

Intervention Professionals (AAIP) and offers a certification exam for professionals involved in animal-assisted therapy.

AAT has proven to be a beneficial intervention for individuals with developmental disabilities. However, therapists implementing AAT must adhere to the AAI standard of practice and obtain additional education regarding animal therapy. Various studies have pointed out that there are a few concerns when implementing AAT such as the welfare of the therapy animals, proper certification or education of handlers, lack of standardization in OT practice, and limited accessibility to AAT. These concerns have raised the question as to whether or not robotic animals can be included as a beneficial preparatory or complementary intervention when AAT is not feasible. The purpose of this study is to gain insight into the perspectives of therapists who incorporate AAT into their programs and ethical considerations within the field of AAT. This study also aims to seek possible implications for robotic animal-assisted therapy (RAAT). Our research question is "Can RAAT be a beneficial preparatory intervention or a suitable replacement for AAT?" We hypothesized that clinicians working within AAT would state that RAAT can supplement AAT, but not replace it.

AOTA Research Agenda, OTPF, & MSOT Curricular Threads

The American Occupational Therapy Association (AOTA) website stated that the inclusion of therapy animals within the OT scope stated that the inclusion of therapy animals within the OT scope can promote meaningful connections with individuals, encourage participation, and improve quality of life (Winkle & Ni, 2019). Even though AAT is an emerging niche setting, OTPs can use this type of intervention to address activities of daily living (ADLs), instrumental activities of daily living, play, and social

participation when working with children with developmental disabilities. Under the fourth edition of the Occupational Therapy Practice Framework performance skills are one of the aspects of the OT domain (AOTA, 2020). Performance skills consist of motor skills, process skills, and social interaction skills. OTPs use performance skills to observe the children's ability to perform meaningful tasks during therapy sessions.

Literature Review

Social Significance

The development and coordination of motor and social skills allow children to explore their environment, which influences daily interactions. Children with developmental disabilities experience delays in motor and social development, which have been linked to lower self-worth and attention deficits (Kim et al., 2016). These delays can interfere with ADLs. The field of OT specializes in addressing functional independence in ADLs and the use of meaningful activities to drive therapeutic interventions.

One means by which OTPs can promote independence in ADLs is by including AAT during treatment (Winkle & Ni, 2019). AAT has made an impact in the therapeutic environment by incorporating animals, such as dogs, horses, and parrots, into therapeutic settings, which has provided positive experiences for many individuals. AAT (2021), describes how animals are specifically trained and selected by educated and licensed professionals, to participate in therapeutic settings, to promote successful outcomes. AAT is beneficial for both the individuals and animals involved. Some benefits of incorporating animals during therapy sessions include increased social interactions and

improved gross motor functions (Bharatharaj et al., 2018; Herrero et al., 2012; Satiansukpong & Sasat, 2019; Tanaka et al., 2021).

Despite these improvements in social and motor skills, practitioners face some challenges when implementing AAT. Burr and Wittman (2020) discussed the importance of addressing safety concerns with AAT before including an animal in therapy. A safety concern is a lack of upholding AAT standards of practice, regarding therapists who are handling the therapy animals and the therapy animals themselves. Shue et al. (2018) also expressed the importance of ensuring proper care of the therapy animal before, during, and after therapy sessions (i.e. access to water, rest, breaks, etc.).

The inclusion of RAAT in the field of OT might also improve the motor and social development of children with developmental disabilities. Researchers have suggested that RAAT may improve environmental awareness, balance control, and general motor development (Satiansukpong & Sasat, 2019; Herrero et al., 2012). Similarly, evidence supports the idea that children with developmental disabilities can improve their social development skills and engagement by interacting with robotic animals, such as a robotic parrot and dog (Bharatharaj et al., 2018; Tanaka et al., 2021; Stanton et al., 2008). Motor and social development in children with developmental disabilities may improve with the use of RAAT. This provides many positive implications for OT practice.

Theme 1: Effect on Gross Motor Function

OTPs are skilled in addressing gross motor function for children with developmental disabilities. New innovative methods for addressing gross motor function are important to explore for OTPs working in pediatric settings. Research has

demonstrated RAAT to improve gross motor skills for children with developmental disabilities. Studies conducted by Satiansukpong and Sasat (2019) and Herrero et al. (2012) incorporated a robotic animal simulator as a treatment method to improve gross motor function in children with developmental disabilities. While Herrero et al. (2012) focused on using a hippotherapy simulator for children with cerebral palsy (CP), Satiansukpong and Sasat (2019) created a motorized elephant-assisted therapy program for children with autism spectrum disorder (ASD). Both studies provide important contributions to the body of knowledge related to RAAT for children with developmental disabilities. In the study conducted by Herrero et al. (2012), significant results were found in gross motor function measures on children in the experimental group, whose trunk extension was activated while sitting on the horse simulator. Despite the small sample size, the efficacy rate was significant at the end of the treatment and follow-up period. Satiansukpong and Sasat (2019) concluded that children's gross motor function improved when given more task demands and environmental opportunities. The task demands while riding the motorized elephant were throwing a ball, controlling a chain to put in a bottle, or collecting tickets. Both studies concluded that motorized animals contributed to the improvement of gross motor function. These findings suggest that the use of RAAT can be beneficial in an OT-based setting.

Theme 2: Social Skills

Several researchers have demonstrated that RAAT results in improved social skills among children with developmental disabilities. Stanton et al. (2008) found that eleven children diagnosed with ASD, ages 5-8, interacted with an autonomous robot dog, named AIBO, and a simple mechanical toy dog, named Kasha. AIBO was capable of

detecting changes in the environment, performing the actions of a live dog, and responding to the actions of the children. Kasha was unable to detect or respond to any changes in the environment. When exposed to AIBO, the children with ASD showed engagement skills as seen in children without ASD. The amount of time spent interacting and the amount of speech the child engaged in was also taken into account throughout the study.

A study conducted by Tanaka et al. (2021) introduced an updated version of AIBO, "new AIBO," to children (0 years, 6 months - 13 years old) with chronic illness, hospitalized at the National Center for Child Health and Development. The new AIBO was built with more dog-like gestures and reacted better to human voices and children's temperaments. This new version recognized familiar faces and mimicked children, which led to more engaging participation. The new AIBO was also used to examine social engagement in pediatric patients and their caregivers, which yielded positive results. Tanaka et al. also found that there were increases in verbal and non-verbal expressions that accounted for two-thirds of the total. These expressions included cooperating, empathy, comfort, and healing. After increased exposure to the new AIBO, some children showed a change in behavior from negative to positive.

Not only have improvements in social skills been found when working with robotic dogs, but also with other forms of robotic therapy animals, such as parrots. Bharatharaj et al. (2018) observed 12 types of social engagement behaviors in ten children with ASD when interacting with the parrot-inspired therapeutic robot and interacting with other adults. Some of the social engagement behaviors included different forms of interaction such as sensory engagement, being in close proximity, and

verbal/non-verbal communication. Results showed that “most participants exhibited more interactions during the robot sessions compared to [sessions with other individuals]” (Bharatharaj et al., 2018, p. 373). These improvements indicate that RAAT can be a beneficial tool for OTPs to utilize during interventions.

Theme 3: Challenges with Implementing AAT

Studies on AAT also address implementation challenges such as safety concerns, lack of standard of practice, engagement, and maintenance. Burr and Wittman (2020) found that while there are positive effects of animal-assisted therapy, steps need to be taken to address safety concerns. For example, before interacting with the therapy dog, some children had to learn how to appropriately pet him. If unable to interact with the therapy animal appropriately, the child would not be suitable for this type of intervention due to behavioral and safety reasons. However, this leaves out a portion of children who may benefit from AAT.

Shue et al. (2018) addressed a lack of standard of practice within the AAT community and maintenance of the animal. AAI has set best practice recommendations and protocols for therapists working with AAT to abide by, to maintain ethical and safety standards. These standards, described by Shue et al. (2018), include that therapists be educated and trained in recognizing the animals' gestures, evoking and improving animal conduct, and establishing and preventing troublesome animal actions through ethical guidelines. Children participating in these interventions should be screened for any medical or mental health conditions and previous animal exposure or involvement in AAT. For AAI's set standards to align with ethical guidelines of research, consent from caregivers should also be obtained before the initiation of AAT. As for the therapy

animal, the animal should be registered and complete a temperament evaluation to ensure the safety of the children. However, according to a study conducted by Shue et al. (2018), some therapists involved in AAT were unaware of whether or not their dogs were qualified for the intervention. Some therapists working within this study did not have any prior education or training in AAT that aligned with AAI best practice recommendations and standards. Rather than screening children, the therapists chose the children based on whether or not they felt they seemed fit to work within their setting. By doing so, medical and mental health conditions, such as allergies and childhood trauma, were overlooked and could have put the child at risk. This study also expressed barriers experienced by AAT therapists such as a lack of program support, lack of course access and awareness, and a lack of time and funding (AAI, 2021). While there have been advancements in the field in recent years, these barriers continue to be areas of concern.

Another challenge of the implementation of AAT addressed in the study conducted by Shue et al. (2018) was animal maintenance. The animals must be introduced to the therapy setting and clinical population before sessions. Therapists must also ensure that the animal has access to food, water, and toileting before and after each session. According to Shue et al. (2018), it is essential for therapists to continuously make sure that the animals are free from discomfort, pain, injury, disease, fear, and/or distress. In addition, therapy animals should have the capability to express normal animal behavior during play breaks. Most therapists were able to provide the basic necessities such as food, water, and bathroom breaks, but many did not implement play breaks or familiarize their therapy animals with the environment before sessions. All of these

considerations imply that working with live animals may not be a feasible intervention across medical and therapeutic settings.

Remaining Gaps in Evidence

These studies have noted multiple limitations and gaps for future researchers to provide more evidence on the effects of RAAT. Most of the articles included some form of robotic animals for social and motor deficits in children with developmental disorders. Satiansukpong and Sasat (2019) focused on the use of motorized elephants in Thailand to develop balance control for children with ASD. Silva et al. (2020) and Stanton et al. (2008) focused on using robotic dogs to determine their effects on the social and physical development of children and adults with ASD. Bharatharaj et al. (2018) focused on the social engagement of children with ASD during interaction with a robotic parrot. Herrero et al. (2012) focused on the effects balance control had on gross motor function through the use of hippotherapy simulators in children with CP. Lastly, Fernaeus et al. (2010) focused on issues with the implementation of RAAT and AAT.

These articles share common limitations such as having a small sample size, limited research on other developmental disabilities aside from ASD, lack of long-term effects, and lack of research on additional motor control deficits. There was also a lack of gender diversity among the participants which could contribute to weaker internal validity, as most of the research was conducted on male children. This gap could be due to ASD more commonly affecting males in a 3 to 1 ratio (Silva et al., 2020). In addition, researchers followed the participants for a short time frame due to a lack of resources, such as finance and manpower, which make it difficult to identify the long-term effects of RAAT. Most of the current research on robotic animals has focused on the ASD

population, more specifically on the social implications. There is a need for expansion of effects on motor control in individuals with developmental disabilities.

Clinical Significance

The involvement of robotic animals during therapeutic interventions has been demonstrated to increase social and motor skills in children with developmental disabilities. Based on the studies reviewed, there is strong evidence for social skill improvement and moderate evidence for motor skill improvement in the treatment of individuals with developmental disabilities using RAAT. Overall, the interventions have supported the short-term effects of RAAT, but cannot provide clinical support for the long-term effects.

Children may benefit from robotic animals being included in sessions as an alternative to live animals. Results from the motorized elephant and horse simulator study suggested that the animal does not have to be a live animal for the children to gain motor improvements (Herrero et al., 2012; Satiansukpong & Sasat, 2019). The short-term engagement with robotic animals had a positive effect on social and motor skills which has been shown to improve ADLs in children with ASD and CP. In addition, the utilization of RAAT can be effective in reducing costs, as well as safety and engagement, for both those seeking and implementing these services.

OTPs may benefit from including robotic animals in therapy. OT implements evidence-based practice through holistic, client-centered interventions, to improve quality of life and promote independence. When working with individuals with developmental disabilities, OTPs focus on teaching skills that enhance ADLs through improving motor and social skills. For example, OTPs can work on their clients' balance control to

improve motor skills and both verbal and non-verbal communication to improve social skills. These skills can be applied to more complex movements such as instrumental ADLs. OT intervention incorporating RAAT could enhance performance in many areas of daily living.

Literature Review Conclusion

Numerous researchers have suggested that RAAT is an effective method for the improvement of motor and social skills in children with developmental disabilities. Researchers found an increase in meaningful social participation with the presence of a robotic animal. Stanton et al. (2008) and Tanaka et al. (2021) found that these skills could later be applied to interactions with other individuals. These improvements in social skills and interactions amongst children with developmental disabilities can provide a great basis for research into the effects of robotic therapy animals. When interacting with a motorized animal through sitting activities, gross motor function was increased. Satiansukpong and Sasat (2019) showed the importance of the utilization of difficult task demands, which promoted a more meaningful and successful intervention.

Currently, research in RAAT is scarce, yet positive results have been seen from each study. All of the studies that were found demonstrated the need for more research on the effects of a long-term study. Conducting studies with larger sample sizes and over longer periods will be more beneficial on the effects of both motor and social skills. Studies should also be conducted on a more diverse population to better show the impact that these interventions can have across the lifespan. For example, future research should expand into other developmental disabilities, as most of the research has been conducted on individuals with ASD. RAAT was shown to be impactful in meaningful ways by

making rehabilitation more fun and attractive and enhancing the children's motivation for therapy (Herrero et al., 2012). Investigation of AAT practitioner perspectives could provide a foundation for future studies.

Theoretical Framework

The OT theoretical framework, the Model of Human Occupation (MOHO), can be used to further understand the benefits of AAT. MOHO is a client-centered therapeutic approach that focuses on the person, the activities of daily living which they participate (occupation), and the environment that influences engagement in occupation (Cole & Tufano, 2020). This model focuses on the relationship between a person and their environment.

MOHO considers the person's social participation through meaningful activities and focuses on three components: volition, habituation, and performance capacity. These three components are said to make up a person. Volition accentuates the person's motivation for occupation, habituation occurs when occupations become a pattern or routine, and performance capacity consists of the person's capacity to perform their occupations (Cole & Tufano, 2020). According to Cole and Tufano (2020), individuals are naturally motivated to engage in occupations and gradually repeat their performance; however, social and physical environments influence engagement in occupations, which can either promote participation and/or create barriers that impact one's occupational performance.

MOHO can be utilized in AAT to promote engagement in therapeutic interventions. Previous studies have shown that children with developmental disabilities became interested when a therapy animal was present and showed higher levels of

engagement. Llambias et al. (2016) found that when utilizing a horse during OT sessions with children diagnosed with ASD, their level of engagement increased and remained the same throughout the study. The more interactions the children had with the therapy animal, the more their volition increased to attend OT sessions. By using MOHO during therapeutic interventions, children with developmental disabilities can become more encouraged to reach their desired goals.

MOHO can also be used to influence motivation and engagement during RAAT interventions. The life-like appearance of the robotic animals can play a role in increasing the children's motivation. In a study conducted by Tanaka et al. (2021), an updated robotic dog new AIBO increased social participation among children with chronic illness. New AIBO was described as having "a rounded shape that gives a sense of warmth, lively form with cuddly sweetness", who interacted with children through eye contact, and showed "vivid, dynamic movement with a variety of lovely gestures" (Tanaka et al., 2021, p. 1056). New AIBO positively influenced children to engage more with the therapist, such as performing a specific task told by the therapist. Another study, conducted by Fernaeus et al. (2010), created a small dinosaur called Pleo for children to interact with during therapy sessions. Pleo was roughly the size of a cat and was capable of wagging its tail, positioning its neck to orient towards the child, controlling its mouth and eyelids, and producing slow walking movements to mimic the qualities of a live animal. The life-like appearance of robotic animals can allow children to make meaningful connections and become motivated to participate in therapeutic interventions that focus on improving activities of daily living.

Methodology

The goal of this research study was to survey professionals working within AAT, to collect their opinions of RAAT, or to see if they have been exposed to this type of therapy. This study also aimed to uncover the possible dilemmas in the field of AAT regarding both animals and professionals. A consent form (refer to Appendix A) was sent to prospective participants, informing them of the nature of the study and participant rights. Participants were informed of the benefits and possible risks, processes to ensure confidentiality, and were provided with contact information if any concerns arose. No further action was taken unless consent forms were signed. SurveyMonkey, a platform for collecting data, was used to create and administer the survey. One official Gmail account was used to send out consent forms and surveys and was also used for all communication with participants. The use of one email account and a Google Drive folder allowed all responses to be stored in one place and safeguarded the confidentiality of the participants, as only the researchers of this study were given access to this account.

The survey contained a total of 10 questions. The first 5 questions were screening questions that determined qualifying participants that reflected our inclusion and exclusion criteria. These questions sought to answer whether these professionals utilized animals in practice, the populations with whom they work with, their highest level of education, their profession, how many years of experience they have in the field of AAT, and where they obtained their training and education. The remaining 5 questions specifically entailed AAT and RAAT questions. These questions asked if the professionals felt animals were beneficial in interventions, if they've ever experienced safety barriers in practice, if they were up to date with AAI standards, if they've ever

witnessed these standards not being upheld, if they've ever heard of or implemented RAAT, and whether or not they feel that RAAT can be a beneficial preparatory or alternative intervention to AAT. The estimated time to complete the survey was about 5-10 minutes. The participants were given the choice to skip any questions that may have elicited a negative response or made them feel uncomfortable. Participants were able to withdraw from the study at any point in time. Data was calculated using Dedoose computer software program. This data analysis tool is useful for collaborative research, allowing researchers to upload and analyze qualitative and quantitative data from several locations (Taylor & Treacy, 2013).

Advantages

Some advantages of the selected methodology included having a consent form that allowed prospective participants to understand the purpose of the study, its benefits, and potential risks. Participants received a link to the survey that included a consent statement that was read before beginning the survey. By clicking "Yes" participants consented to participate in the study. By utilizing a user-friendly survey platform to deliver data, participants were able to complete the study from the comfort of their own homes or workplace. This may have allowed more opportunities to reach a wider range of participants regardless of geographic location and time zones. The use of one email account made survey responses only accessible to the researchers of this study. Another advantage was providing participants with the opportunity to expand their answers by including a "please specify" section on selected questions. To increase the internal validity of data and prevent human error, information was processed using Dedoose. The

researchers coded the open-ended responses as a team and were approved by eligible faculty.

Participants

The target population for this study included professionals that incorporated therapy animals into treatment sessions. The professionals in this research study included but were not limited to psychologists, psychiatrists, OTPs, social workers, and speech-language pathologists. Participants were recruited through Pet Partners discussion forums and newsletters, as well as multiple AAT private and public Facebook groups. The goal was to recruit at least 20 to 30 participants; however, only 15 participants were recruited. The inclusion criteria for participants in this study consisted of professionals that have obtained proper training and education in AAT, are licensed to work with clients, and have experience working within AAT. Since the survey was in English, only those fluent in English were eligible to participate. Participants were also required to currently live within the United States. Exclusion criteria for participants in this study included professionals without adequate internet access. All participants received a consent form with information about the purpose of the study, the benefits, the duration, the withdrawal policy, compensation, confidentiality, and point of contact. The consent form aimed to protect the participants while providing legal coverage for the researchers. To limit participation to qualified subjects, clarifying questions were asked at the beginning of the survey. Researchers went through each survey entry and identified/disqualified those who did not meet the inclusion criteria.

Study Design

Dedoose software, a cross-platform app, was utilized due to its ability to analyze qualitative and mixed-method research which includes open-ended questions. The data collected from the survey was put into Dedoose to analyze the open-ended questions by assigning codes to common themes between each participant's answers. The survey questionnaires collected data information such as population, type of animals, profession, years of experience, qualifications, and specific questions relating to AAT and RAAT. The codes were a means to organize, analyze, and quantify quantitative data. Faculty advisors were consulted on each code and approved continuing, which contributed to increased internal validity. The codes were organized into comprehensive charts. The information was used to determine the current perspective of clinicians on AAT and if a potential use of RAAT is seen. The closed-ended questions were calculated by the researchers and converted into percentages. SPSS Statistics was used to analyze and code the data gathered from the survey.

Ethical and Legal Considerations

To ensure that participants understood the nature of our research and were willing to participate, all were required to read the consent statement. The consent statement informed prospective participants of the purpose and benefits of our study and allowed them to make a voluntary decision as to whether or not to participate by clicking "Yes" or "No". This study did not include vulnerable populations and no intervention took place. To safeguard participant anonymity, all identifiable data such as name and place of employment was not included in our study. Upon receiving a participant's input, researchers documented data from each participant on a spreadsheet and assigned each

participant a number to leave out any identifying information. From there, the personal email that was utilized to complete the survey was immediately deleted from the password-protected email address for further subject protection.

For safety concerns, this study was completed online to reduce the spread of COVID-19 and practice social distancing. A secure online survey platform, SurveyMonkey, was used to collect responses from participants and did not involve any potential risks, or any questions that might have made participants uncomfortable. However, if participants felt that specific questions may have elicited a response, they had the right to skip questions or withdraw from the study at any time. One official Gmail account was utilized for all communication with participants, which was password protected and only accessible to the student researchers and principal investigator. Data was not made available to the public and will be retained for at least 3 years following the study's completion. This research study focused on surveying professionals working within AAT, to find out their opinions of RAAT, or if they have been exposed to this type of therapy.

Results

A total of 15 responses were collected from the survey. However, one respondent did not meet the inclusion criteria and was excluded from our study.

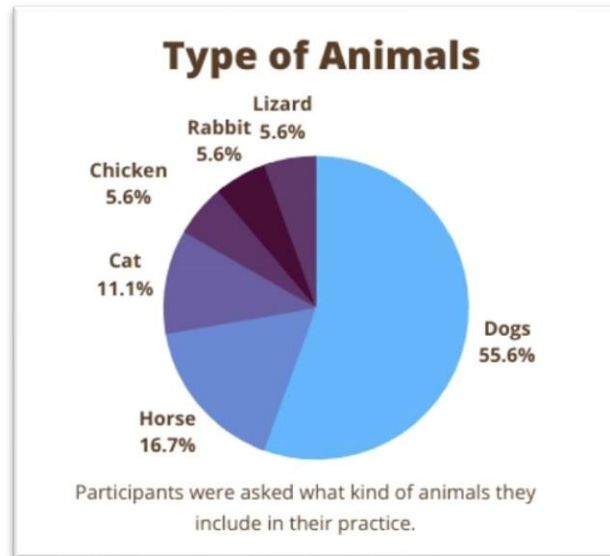
Figure 1*Type of Animals*

Figure 1 displays the types of animals that participants include in their practice.

Of the 14 participants, 10 (55.6%) reported incorporating dogs, 1 (5.6%) reported incorporating rabbits, 1 (5.6%) reported incorporating lizards, 3 (16.7%) reported incorporating horses, 2 (11.1%) reported incorporating cats, and 1 (5.6%) reported incorporating chickens. While a variety of animals were reported, the most common animal incorporated into AAT practice was a dog.

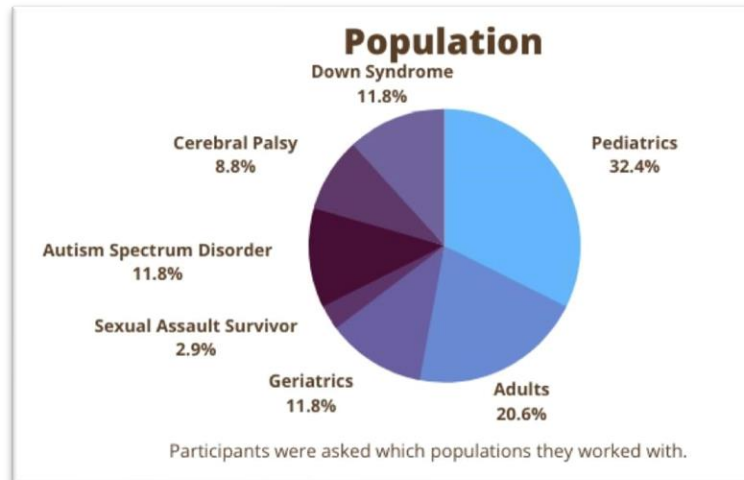
Figure 2*Population*

Figure 2 displays participants' responses to the types of populations with which they work. Of the 14 participants, 4 (11.8%) reported working with individuals with Down syndrome, 11 (32.4%) reported working in pediatrics, 7 (20.6%) reported working with the adult population, 4 (11.8%) reported working within the geriatric population, 1 (2.9%) reported working with sexual assault survivors, 4 (11.8%) reported working with individuals diagnosed with ASD, and 3 (8.8%) reported working with individuals diagnosed with CP. Of the various populations listed, about a third reported working with the pediatric population.

Figure 3

Degree of Education

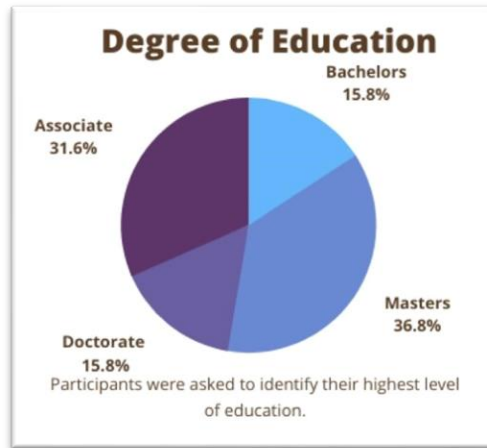


Figure 3 displays participants' highest level of education. Most participants (7) reported having a master's degree (36.8%), followed by 6 participants having an associate degree (31.6%); whereas, 3 (15.8%) participants reported having a bachelor's degree and 3 (15.8%) participants reported having a doctorate degree.

Figure 4

Profession

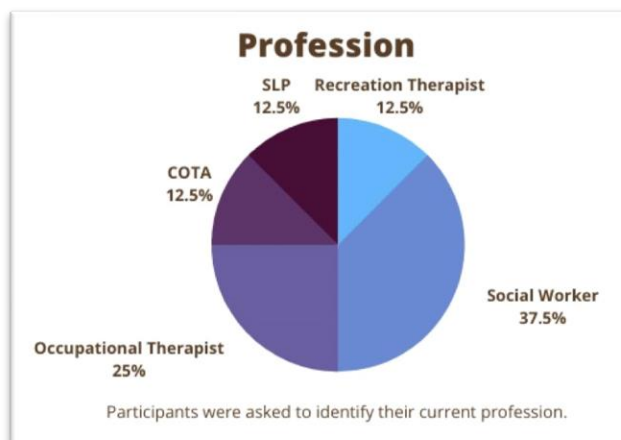


Figure 4 displays the participants' current professions. Among the 14 participants, 1 (12.5%) was a recreation therapist, 3 (37.5%) were social workers, 2 (25%) were

occupational therapists, 1 (12.5%) was a certified occupational therapy assistant, and 1 (12.5%) was a speech-language pathologist. The majority of participants reported being social workers.

Figure 5

Years of Experience



Figure 5 displays how many years of experience these professionals have working with animals. Of the 14 respondents, 9 (64.3%) reported having at least 9 or more years of experience, 2 (14.3%) reported having between 0-5 years of experience, and 3 (21.4%) reported having no experience at all. The majority of the respondents reported that they had at least 10 years of experience in the field of AAT.

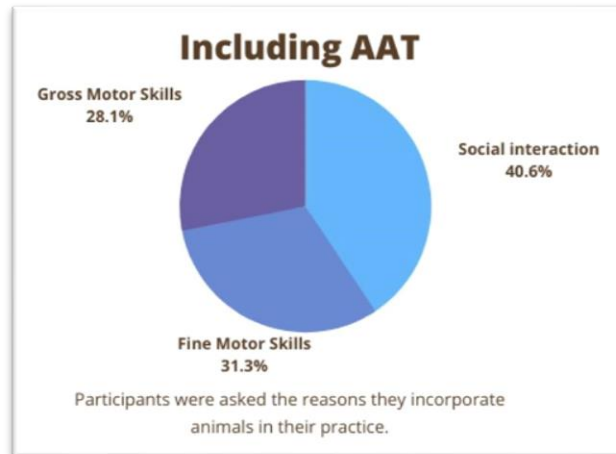
Figure 6*Including AAT*

Figure 6 displays the reasons why participants incorporate animals in their practice. The three benefits reported were improvement of gross motor skills, fine motor skills, and social interaction. Of the 14 participants, 9 (28.1%) reported they incorporated AAT to improve gross motor skills, 10 participants (31.3%) reported they incorporated AAT to improve fine motor skills, and 13 (40.6%) participants reported incorporating AAT to improve social interaction. Of the 3 skills listed, the majority of participants incorporate AAT to improve social interaction.

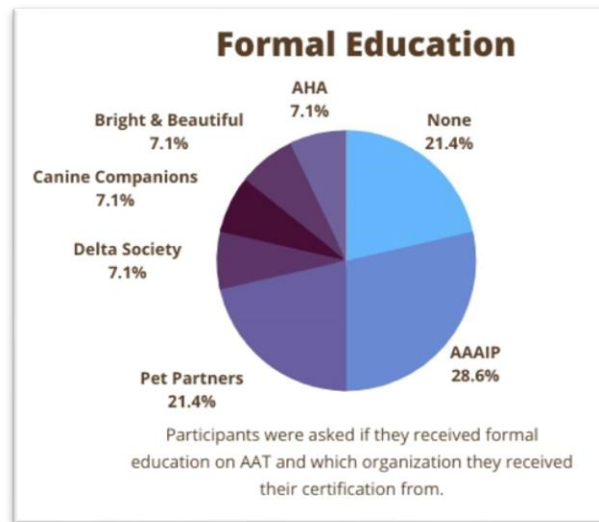
Figure 7*Formal Education*

Figure 7 displays the organizations from which participants received formal education on AAT and if they obtained formal education at all. Of the 14 participants, 3 did not provide additional information regarding where certification was granted, while 5 reported multiple certifications. Three participants (21.4%) obtained their certification through Pet Partners, while four participants (28.6%) obtained their certification through the AAAIP. Lastly, three participants (21.4%) reported they did not receive any form of formal education. American Humane Association, Bright and Beautiful, Canine Companions, and Delta Society were some other organizations participants received their certification through.

Figure 8

AAll Standards



Figure 8 displays which participants were up-to-date with AAll standards. Of the 14 respondents, 9 reported being up to date while 5 reported not being up to date.

Figure 9

RAAT

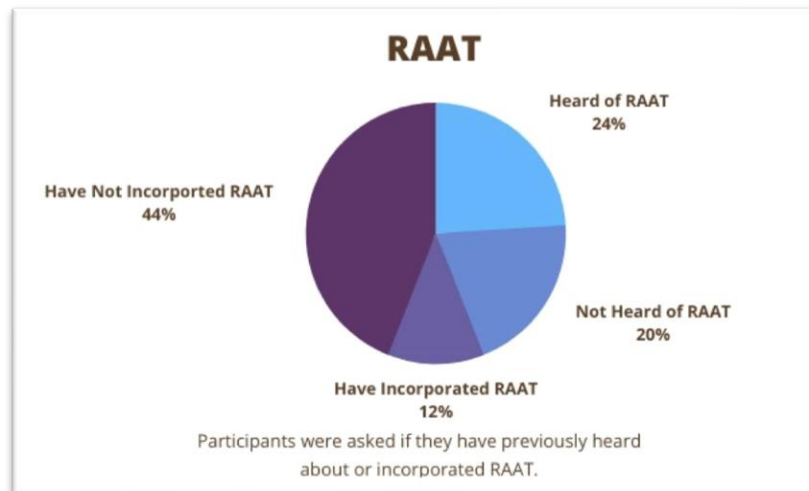


Figure 9 represents participants who have heard about RAAT and have incorporated robotic animals during their practice. Participants had the option of choosing whether they have not heard of RAAT or incorporated robotic animals, they have heard

of RAAT and incorporated robotic animals, and they have heard of RAAT but had not incorporated robotic animals. This was a select all-that-apply question and of the 14 participants, 6 (24%) reported that they have heard of RAAT, while 5 (20%) had not. Out of those participants, only 3 (12%) have incorporated robotic animals during their practice and 11(44%) have not.

Figure 10

Beneficial Intervention

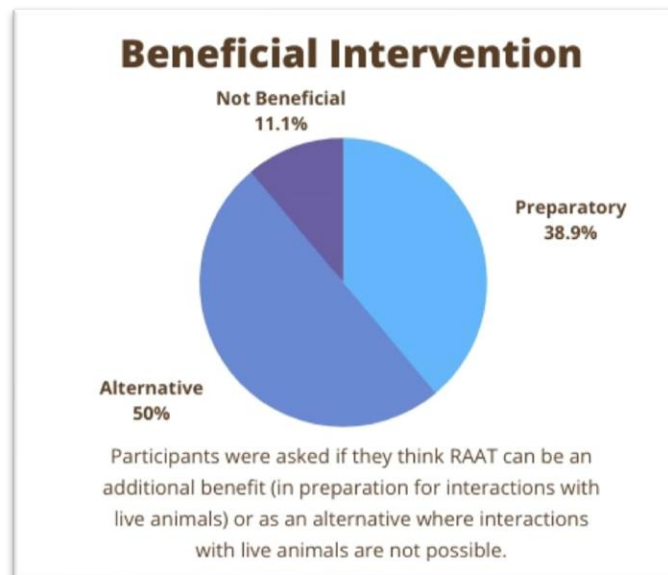


Figure 10 shows if the participants believe RAAT can be a preparatory intervention or an alternative when interactions with live animals are not possible. This was a select all-that-apply question where of the 14 participants, 9 (50%) thought it can be an alternative intervention and 7 (38.9%) thought it can be a preparatory method; however, two participants expressed they did not believe it would be a beneficial preparatory or alternative intervention.

Figure 11*Witnessing AAI Standards*

Figure 11 displays how many participants have witnessed other professionals not upholding AAI standards. Six participants (66.7%) have witnessed other professionals upholding AAI standards, while three participants (33.3%) have seen failure in upholding AAI standards.

Figure 12

Dedoose Qualitative Chart

Codes	Codes																							
	Animal Welfare	Animal Stress	Environmental conditions	Rough Treatment	Appropriateness	Population	Proper education	readiness	Benefits of AAT	Mental health	Motivation	Therapeutic relationships	Potential Specific Uses of RAAT	Assess readiness for a pet	Good for some groups not all	Incorporated into rehab (PTIOT)	Preparatory activity	To have before going into surgery	good alternative	Safety Concern	Aggression	Human-animal well-being	Medical concerns	Totals
Animal Welfare		3	3	2	4	2	3	2					1	1	1	1	1	1		5	2	4	2	36
Animal Stress	3		2	1	2	2	2	1					1	1	1	1	1	1		3	1	2	2	25
Environmental conditions	3	2		1	2	2	2	1					1	1	1	1	1	1		3	1	2	2	25
Rough Treatment	2	1	1		2	1	1	1												2	1	2	1	15
Appropriateness	4	2	2	2		4	4	1	1			1	2		2				1	6	2	5	2	41
Population	2	2	2	1	4	1	1	1	1			1	3	1	2	1	1	1	3	2	1	3	33	
Proper education	3	2	2	1	4	1														4		4	1	22
readiness	2	1	1	1	1	1							1	1	1	1	1	1		2	2	1	1	17
Benefits of AAT					1	1				1	6	6	1					1						17
Mental health									1		1													2
Motivation									6	1		3	1					1						12
Therapeutic relationships					1	1			6		3	1						1						13
Potential Specific Uses of RAAT	1	1	1		2	3		1	1		1	1			2	1	1	1	1	1	2	2	2	26
Assess readiness for a pet	1	1	1			1		1									1	1	1	1	1	1	1	11
Good for some groups not all					2	2							2							1	1	1	1	10
Incorporated into rehab (PTIOT)	1	1	1			1		1											1	1	1	1	1	11
Preparatory activity										1		1	1	1										4
To have before going into surgery	1	1	1			1		1					1	1	1	1	1			1	1	1	1	11
good alternative						1	1	1																7
Safety Concern	5	3	3	2	6	3	4	2					2	1	1	1	1	1	1	1	5	1	6	54
Aggression	2	1	1	1	2	2		2					2	1	1	1	1	1	1	1	5	2	2	27
Human-animal well-being	4	2	2	2	5	1	4	1												1	2	2	2	33
Medical concerns	2	2	2	1	2	3	1	1					2	1	1	1	1	1	1	1	6	2	2	31
Totals	36	25	25	15	41	33	22	17	17	2	12	13	26	11	10	11	4	11	7	54	27	33	31	

Figure 12 captures the frequency of which categories and codes are mentioned in each qualitative survey response. A total of 5 categories and 18 codes were founded by the researchers which were then inputted on Dedoose. The qualitative chart on Dedoose shows the category “Safety Concern” and the code “Human-animal well-being” being the most frequently used 54 times.

Figure 13*Theme 1: Considerations for when to incorporate AAT*

Category	Codes
Professionals must be aware of the safety concerns that may arise during practice	human-animal well-being, medical concerns, aggression
Professionals must take into account the animal's welfare during practice	rough treatment, animal stress, environmental conditions
Appropriateness of the population and the environment must be considered	proper education, population, readiness

Figure 13 describes the different factors participants considered when incorporating AAT into practice. The most prevalent considerations among participants were the safety concerns one should have when implementing AAT, animal welfare, the appropriateness of the population being worked with, and the environment in which they are.

Figure 14

Theme 2: Various benefits to both AAT and RAAT

Category	Codes
Benefits of the human-animal bond	therapeutic relationships, mental health, motivation
Potential specific uses of RAAT can be therapeutic and nontherapeutic	Preparatory activity, good some groups not all, good alternative, assess readiness for a pet /emotional support animal, to have before going into surgery, incorporated into rehab (PT/OT)

Figure 14 demonstrates the many benefits that both AAT and RAAT may have on clients. Looking at the benefits of AAT, many participants touched on the impact animals have on building therapeutic relationships, improving mental health, and increasing motivation. Some of the benefits mentioned by participants include: “normalization of unfamiliar or uncomfortable environments”, “provide companionship and comfort”, “introduce social interaction”, and “improve well-being”. There are also specific potential uses of RAAT which can either be therapeutic or non-therapeutic. Some potential uses mentioned by participants include: “preparatory activity”, “good for some groups”, “alternative”, “before surgery”, and “incorporated into rehab”.

Discussion

The participants included in the study were reported to be animal-assisted intervention professionals (AAIP) incorporating AAT in their respective fields. AAIP are “health care providers, educators, and others [who] gain the knowledge needed to safely and ethically practice animal-assisted interventions while advancing the field” (Pet

Partners, 2022a). Participants in the study came from diverse professional backgrounds, such as OT, speech therapy, and recreational therapy; however, most respondents came from a social work background (Figure 4). A majority of these participants reported integrating dogs into their therapy sessions, as seen in Figure 1. AAT can be used across the lifespan, with multiple diagnoses; however, participants reported working the most within the pediatric population and with those diagnosed with ASD and Down syndrome (Figure 2). Through the research conducted, it was identified that AAT is thought to offer numerous therapeutic benefits.

Participants were asked to identify the reasons they incorporate animals in their practice. It was found that three particular skills were targeted in their practice: gross motor, fine motor, and social interaction skills. According to Griffin et al. (n.d.), partnering with animals can improve fine motor skills, gross motor skills (standing tolerance and balance), and create a more engaging and motivating environment for the client. This could be done through tasks such as grooming and feeding the animal. These skills are further explained in the fourth edition of the Occupational Therapy Practice Framework, which was developed to promote the “health and participation of persons, groups, and populations through engagement in occupation” (AOTA, 2020). The three particular skills fall under the domain of body functions such as numerous neuromusculoskeletal and movement-related functions; multiple mental functions; and many sensory functions. Performance skills are another domain that was discussed in the study, which consists of motor, process, and social skills. These are observable and goal-directed actions that were identified by participants as areas that could be addressed in OT. This also suggests how RAAT can be incorporated into OT in a variety of ways,

such as, improving social interactions and strengthening gross and fine motor skills needed to engage in daily activities (Figure 6).

The American Occupational Therapy Foundation research agenda recognizes how OT can be supported by research. The research category “translational research” evaluates the “effectiveness of occupational therapy interventions” (AOTA & American Occupational Therapy Foundation, 2011). Through translational research, our study was able to identify new interventions to incorporate in OT, such as AAT and RAAT. This study specifically focused on certain priority populations, such as developmental disorders, cognitive impairments, and mental disorders. This is beneficial to the field of OT by promoting occupational engagement and participation among all individuals.

Besides the impact AAT has on gross motor, fine motor, and social interaction skills, participants touched on the impact animals have on building therapeutic relationships, improving mental health, and increasing well-being. In the field of OT, “therapy animals were reported to help clients develop fundamental life skills... [and] can help develop coping skills, foster a sense of belonging, and understand personal space and perspective-taking” (Griffin et al., n.d., p. 19). Respondents stated that their therapy animals were incorporated to “help develop connections,” “encourage participation,” and “decrease anxiety.” These results demonstrated the value of the human-animal bond, and the influence animals can have on one’s quality of life. Research has also shown that “people may seek animals when they are feeling distressed in relationships or feel a lack of them or in times of major life transitions, stress, loss, or uncertainty” (Fine & Ferrell, 2021, p. 29).

Although there are many benefits to AAT, participants stressed many factors to take into account regarding the importance of knowing when and how to implement AAT. These factors are safety concerns, animal welfare, and appropriateness. There were many safety concerns the participants spoke on, one of which was the importance of human-animal well-being. For instance, if the working environment was too stimulating or hazardous, the animal may become overstimulated, resulting in poor behavioral or impulse control, and resulting in injury to themselves, their handlers, or the clients they are with. Research shows that overstimulation can be due to changes in temperature, olfactory, and visual information; therefore, to limit overstimulation, “[animal-assisted intervention] handlers should be encouraged to offer exploration opportunities to their dog each time they enter a setting...to increase control of the situation, heighten autonomy, predictability and structure” (Glenk & Foltin, 2021, p. 11). Participants from our survey stated other situations that can cause poor behavioral reactions are when clients “have difficulty being appropriate with animals (i.e. pulling on [their] face, petting [them] roughly, etc.)”. This also relates to medical concerns seen when including animals in therapy. A participant shared their concern over the therapy animal’s welfare: for example, clients or their families may request the animal to visit when they are past their limits or in inappropriate settings such as pre- or post-op environments. This raises a concern over sterilization of the environment and the safety of immunocompromised patients and even the possible risk of zoonotic diseases. Another participant shared that therapy animals not receiving proper care from their handlers may “mark the furniture with urine”, leading to unsanitary conditions.

Another large concern amongst participants is animal welfare. It was expressed that if a handler does not receive proper training, they miss their dog's stress signs, which can then lead to further safety concerns. Some signs that are seen among therapy dogs "in response to an escalation of perceived stress and threat [include] yawning, blinking, and nose licking to biting" (Mignot et al., 2022, p. 13). A participant shared that they have encountered that some clients or their families had a lack of respect for the welfare of the animal. They assume that all therapy animals should be fit to work in any setting or with any client and "do not take into account each dog as an individual, living, sentient being".

Finally, another aspect of AAT to consider is the appropriateness of the practice. As previously mentioned, not all therapy animals will be appropriate in every environment or to work with every client. This demonstrates the need for education to understand what is appropriate and when, not just for the handlers themselves, but also for other staff working within the healthcare field. One participant noted that "the majority of staff in [hospitals] are not educated about AAI standards of practice" and may also make inappropriate requests as previously mentioned. When it comes to handlers themselves who bring therapy animals into hospital settings or other more appropriate ones, they will "have the animal in the room, but do not engage the animal in purposeful activities". Research suggested that "professionals should be trained to protect the well-being of therapy animals, not just for the animals' sake, but also to protect their clients and to minimize any risks associated with the intervention" (Griffin et al., n.d., p. 11). This emphasizes the need for proper education to avoid any safety concerns that may result. Lastly, something to highly consider is the population with which the therapy animals are working. Many participants expressed how they have witnessed AAT being

very beneficial for those with Alzheimer's and dementia. Aarskog et al. (2019) concluded that dogs are promising in reducing behavioral and psychological symptoms, and depression, while improving mood and quality of life among residents with dementia. This supports that doing further research on the effects AAT has on these populations can benefit many others.

When taking into consideration the factors to effectively implement AAT, professionals must consider AAI standards. The study found that 35.7% of respondents were not up to date on AAI standards of practice (Figure 8). Participants were also asked if they have ever witnessed other professionals not upholding AAI standards, to which 33.3% stated they have witnessed this happening in practice (Figure 11). Some of these standards include ensuring the animal has access to food, water, play, and restroom breaks, among many others. Many AAT organizations (besides AAI) may "have their own policies and procedures for screening, evaluating, and instructing dogs and their owners/handlers" (Serpell et al., 2020, p. 2). These policies and procedures are essential to ensure safe and ethical practice, so having additional training is important when utilizing animals.

With there being a lack of standardization seen in practice currently, this poses a question as to whether or not RAAT can be a beneficial preparatory or alternative intervention to AAT. In the study, AAIP suggested that RAAT can help assess clients' readiness for emotional support animals and provide a good preparatory intervention or alternative for those who are not fit to work with live animals. If an individual can benefit from working with a live animal, but may need to learn how to appropriately interact with one (i.e. those who are too rough with live animals and can potentially cause a safety

hazard or those who present with communication difficulties), they can learn from interactions with robotic animals who mimic the behaviors of live animals. For instance, studies have shown that individuals with ASD who may have communication challenges, can benefit from RAAT to “improve upon their impairments and communicate with the environment and people around them” (Alabdulkareem et al., 2022, p. 8). AAIP also suggested that RAAT can be a beneficial alternative. For example, if an individual is fearful of live animals, they can build a similar connection to a robotic one while reducing their fears. On the other hand, robotic animals can be a good alternative for those who are immunocompromised or may have allergies to live animals. By using robotic animals, interventions can be tailored to the needs of the individual, as well as significantly reduce or eliminate the risk of infection that live animals may pose (Hetland, 2022).

As previously mentioned, participants shared that a large benefit of AAT was the human-animal bond. Participants stated that animals can “provide companionship and comfort” and “introduce social interaction.” A research study supported the idea that “the impacts of dogs on the social well-being of individuals are especially salient for individuals with disabilities who may feel socially isolated and after obtaining a support dog experienced increased involvement in their communities and engagement in social interactions” (Fine & Ferrel, 2021, p. 26). When asked if they felt RAAT could be a beneficial preparatory or alternative intervention when interaction with live animals is not possible, a majority of participants believed that it could be (Figure 10). They felt that robotic animals can be capable of mimicking the behaviors of a live animal. For instance, as of October 2022, there is a study currently being conducted on the effects of a robotic

baby harp seal, Paro, and how it can motivate hospitalized children to participate during inpatient physical therapy/OT sessions (Hetland, 2022). So far, the children are experiencing less stress, anxiety, and depression compared to those not incorporating Paro in their therapy sessions. Although many participants felt that robotic animals could mimic live animals and provide the same human-animal bond, one participant expressed that they felt the “beauty of human-animal interaction and animal-animal interaction is the connection between the animal and the client.” Whether or not one feels that a robotic animal can produce the same bond as a live animal, will be up to the individual’s discretion and preferences.

Though there were many benefits of AAT and RAAT found in this study, it is still an emerging and niche practice. According to Pet Partners (2022b), AAAIP officially launched on March 24, 2022. Possibly due to RAAT being a novel intervention, the majority of the participants have not heard about RAAT and have not incorporated robotic animals during their practice (Figure 9). However, those who have heard of and incorporated RAAT contributed to the current research on the effects and benefits of this type of intervention by participating in this present study.

Limitations

There are several limitations to this research study. To start the recruitment process, Institutional Review Board (IRB) approval had to be obtained. Many revisions were needed, resulting in a shorter time frame to complete the study. Researchers also encountered problems with the SurveyMonkey platform itself. For example, the platform required further financial compensation to access certain features. Researchers did not have adequate funding to support these financial compensations, limiting the use of the

platform to only allow for a limited number of questions as well as hindering the quality of responses. Due to this, the survey questions were rather lengthy to try and elaborate a fewer number of questions, which could have resulted in parts of the questions going unanswered. After sorting through SurveyMonkey complications and obtaining IRB approval, researchers posted recruitment material to the Pet Partners discussion forum; however, discovered a minimal amount of responses. This resulted in an IRB modification form to recruit from both public and private AAT Facebook groups, to gain further involvement. Although this provided more responses, there were also complications seen using these platforms. To post recruitment material and the survey link, permission was required from each Facebook group's administration team which limited the timeframe even further. Another complication with using these Facebook groups was whether or not members would see the post before it was no longer visible, due to not frequenting the group.

AAT is a niche and emerging practice setting, which limits the pool of available participants and subsequently the sample size of the study. Despite these complications, responses were received from 15 participants; however, researchers had to disqualify 1 participant because they did not meet the inclusion criteria of the study. Of the 14 qualified respondents, not all answered every part of each survey question which affected the quality of the responses. For example, some participants answered how many years of experience they have in their profession but did not state their profession. Others expressed that RAAT can be a beneficial preparatory or alternative intervention to AAT but did not provide any reasoning. This could be due to the questions being too wordy to understand.

Survey research falls under the Level VII category which takes into account experts' opinions and reports (Ascension, 2022). Level VII is the last of the seven levels, making surveys a lower level of evidence compared to other research studies. Another limitation is researcher bias in the wording of the survey questions. Rather than leaving all questions open-ended and up to the interpretation of the respondent, researchers provided some answer options based on themes found in their research. Participants are more likely to select a given answer option instead of writing out their answers. Lastly, our thesis advisor, Dr. Macy Burr, OTD, OTR/L, CAS, currently works within AAT, which may present researcher bias.

Conclusion

Though there were many benefits of AAT and RAAT found in this study, it is still an emerging and niche practice. Many of the responses provided and the research show that further research into this area of practice can highly benefit a variety of populations. AAAIP was recently launched, meaning it is beginning to become a better-known practice. The benefits of RAAT can provide similar benefits to AAT, but be more inclusive, especially to those who are unable to interact with animals for medical, behavioral, or personal reasons. OTPs can incorporate animals in planned and measurable intervention activities to increase quality of life by focusing on client-centered goals that facilitate participation in everyday life. There can be a lack of standardization, especially within OT since the AOTA does not offer any formal certification. This research can help OTPs become more informed about the standardization of intervention and provide a resource for formal training. It can also equip OTPs with more options when AAT is not possible.

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Appendix A

Informed Consent Form

Institutional Review Board
 (IRB) APPROVED
 Approval Date: 8/25/2022


Consent Form

Institutional Review Board

Title of Study: Robotic Animal Assisted Therapy: A Survey of Current Perspectives and Ethical Considerations

DESCRIPTION

This study involves research about animal-assisted therapy (AAT) and whether robotic animal-assisted therapy (RAAT) can be a potential alternative to AAT. The purpose of this study is to survey professionals working within AAT, to collect their opinions on RAAT, and aims to uncover possible dilemmas using AAT. Participants will be asked to complete a survey about AAT and their experience utilizing this type of intervention in their sessions.

TIME INVOLVEMENT AND DURATION

The participant will only need to complete the survey one time for approximately 15 minutes.

RISKS AND BENEFITS

Risks: Some questions may make individuals uncomfortable, however they may choose to skip questions if necessary.

Benefits: The field of animal-assisted intervention (AAI) will benefit from having this intervention more available and known to the public.

Completing this survey will help with gaining more insight into this niche practice.

PARTICIPANT'S RIGHTS


Your participation is voluntary. You may choose not to participate at any stage of the study without penalty and your identity will be kept confidential.

COMPENSATION FOR PARTICIPATION

There will be no compensation given for participation in this study.

PRIVACY/CONFIDENTIALITY/DATA SECURITY

This survey will be anonymous and no identifiable information will be requested from participants. The survey is being conducted through SurveyMonkey, which has its own privacy and security policies. Data will be password protected and transferred to a secure, password protected Google Doc where all answers will be compiled and accessible only by the researchers. The student researchers and principal investigator will only have access to the data. We anticipate that your participation in this survey presents no greater risk than everyday use of the internet. Data may exist on backups and server logs beyond the timeframe of this research study, but we cannot guarantee against hackers.


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Data will not be made available to the public. Upon receiving a participant's input, researchers will document data from participants on a spread sheet and assign each participant a number to leave out any identifying information. From there, the personal email that was utilized to complete the survey will immediately be deleted from the password protected email address for further subject protection. The storage of information, except the emails, will remain until the account is deleted. The consent records, data collected, and IRB documentation will be retained for at least 3 years following the study's completion.

CONTACT INFORMATION

If you have questions about your rights as a research participant, you may contact the Stanbridge University Institutional Review Board (IRB), which is concerned with the protection of volunteers in research projects. Please call the IRB Office at 949-794-9090 or via email at irb@stanbridge.edu.

Please contact the principal investigator and/or co-investigator if you have any questions about this research study.

Principal Investigator: Dr. Burr OTD, OTR/L, CAS

Email: MBurr@stanbridge.edu

Co-Investigator: Jordan Buntich OTS

Email: jordan.buntich@my.stanbridge.edu




Appendix B

Survey Questions

* 1. I consent to participating in this study 

Yes

No

* 2. Do you include animals in your practice? If yes, please specify. 

Yes

No

Please specify: (dogs, horses, cats)

3. What population do you work with? Select all that apply. 

Pediatrics

Adults

Geriatrics

Autism Spectrum Disorder

Cerebral Palsy

Down Syndrome


Other (please specify)

4. What is your highest level of education and what is your current profession? Select all that apply. 

- Associate's Degree
- Bachelor's Degree
- Master's Degree
- Doctorate Degree
- Psychologist/Psychiatrist
- Occupational Therapist
- Social Worker
- Speech Language Pathologist
- Other (please specify)

5. How many years of experience do you have in this field and where did you obtain your training/education for Animal Assisted Therapy (AAT)? Select all that apply. 

- 0-5
- 5-10
- 10+
- I did not receive any formal training/education
- Please specify where:

6. Do you think including animals is beneficial during therapy sessions? If so, please select your reasons for incorporating AAT. Select all that apply. 

- Yes
- No
- To improve social interaction
- To improve gross motor function
- To improve fine motor function
- Other (please specify)


7. Have you dealt with any safety hazards or barriers during interactions with your therapy animals and clients during sessions? 

- Yes. Please briefly explain below
- No. Please briefly explain below if you see any potential hazards or barriers


Please briefly explain here:

8. Are you up to date with AAll (Animal Assisted Intervention International) standards? Have you ever witnessed other professionals not upholding these standards? Select all that apply. 

- Yes, I am up to date with AAll standards
- No, I am not up to date with AAll standards
- Yes, I have witnessed other professionals not upholding these standards
- No, I have not witnessed other professionals not upholding these standards
- If comfortable please explain.

9. Have you heard of robotic animal assisted therapy (RAAT) before? If so, have you incorporated robotic animals before? Select all that apply. Select all that apply. 

- No, I have not heard of RAAT or incorporated robotic animals
- Yes, I have heard of RAAT and have incorporated robotic animals
- Yes, I have heard of RAAT but have not incorporated robotic animals
- If yes, what type of robotic animal?

10. Do you see RAAT as an additional benefit (in preparation for interactions with live animals) or as an alternative where interactions with live animals are not possible? Select all that apply. 

- Yes, I think RAAT can be a beneficial preparatory intervention to AAT
- No, I do not think RAAT can be a beneficial preparatory intervention to AAT
- Yes, I think RAAT can be a beneficial alternative when interactions with live animals are not possible
- No, I do not think RAAT can be a beneficial alternative when interactions with live animals are not possible
- Please explain why.

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