The Impact of Animal-Assisted Therapy on the Well-Being of Individuals with Various Disorders

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Abstract: Well-being is closely linked to social belonging and psychological health. Psychotherapy and pharmacological treatments targeting these components significantly improve well-being. The current review aimed to understand how animal-assisted therapy (AAT) contributes to positive social and psychological outcomes in individuals with mental illnesses, neurodevelopmental disorders, and cognitive impairments. Given the varying treatment approaches required for these conditions, the review also explored how AAT implementation differs based on age characteristics. Results indicated that AAT tasks were more physically demanding for children compared to elderly participants. For elders, AAT focused on meeting unmet emotional needs to improve well-being, while for children, the focus was on enhancing engagement and self-regulation skills. Both age groups experienced improvements in positive moods, anxiety levels, and social connections. However, no significant cognitive or mental health improvements were observed. Future research should explore the long-term benefits of AAT, investigate its potential cognitive benefits for elderly participants, and examine strategies to optimize the involvement of professionals during therapy sessions.

1 INTRODUCTION

The connection between humans and animal dates back approximately 140,000 years, when animals were integral to human survival, aiding in agriculture and hunting (Beggs & Townsend, 2021). From meeting basic life needs to supporting emotional well-being, the profound power of the human-animal bond in addressing both physical and emotional needs is undeniable. Today, service animals are commonly seen in public settings, assisting individuals with disabilities and mental health challenges. Unlike service animals, therapy animals provide emotional support, guiding and motivating patients through traditional psychotherapy or recovery plans such as addiction treatment, motor skill training, and emotional regulation. The use of therapy animals as complementary tools in treatment has become increasingly widespread. Numerous studies on AAT have demonstrated positive outcomes for both psychological and physical health. However, as AAT has been applied across various settings and populations, research has focused on understanding the variables that influence its outcomes. For example, investigating the time required to form effective animal-human bonds is essential for designing treatment sessions (Rodrigo-Claverol et al, 2023). Variables such as treatment settings, patient age, accessibility to AAT, and knowledge about the therapy contribute to differences in treatment outcomes.

Well-being, a key focus of positive psychology, encompasses social skills and mental health, as these aspects emphasize social functioning and positive emotions. AAT improves patients' psychological and social conditions through goal-oriented activities involving interactions with animals (Beggs & Townsend, 2021). The supportive and nonjudgmental environment fostered in AAT provides a safe space for patients to connect, build trust, and actively participate in therapy, thereby enhancing the quality of treatment. The effectiveness of AAT, however, varies across age groups, depending on cognitive levels, physical capacities, and treatment goals. Understanding how age differences impact AAT procedures require a more systematic and focused analysis of past research. The current study aimed to explore the positive outcomes observed in patients with various disorders related to AAT. Additionally, the research sought to identify the different approaches used in AAT to accommodate the needs of different age groups. The current review retrieved and analyzed articles from the core collection of the

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Web of Science database, using keywords such as "animal-assisted therapy," "age differences," "well-being," "mental health," and "social skills." Studies were filtered to exclude review articles, non-English studies, and articles focusing on counseling neurotypical or mentally healthy individuals, improving academic performance, or anecdotal information. The final analysis included five selected articles after screening relevant abstracts and excluding unrelated studies.

2 LITERATURE REVIEW

2.1 Animal-Assisted Therapy

AAT is a form of animal-assisted intervention that emphasizes building human-animal bonds by integrating animals into goal-oriented activities. Archaeological research has provided evidence of the benefits of human-animal interactions dating back 14,000 years, during the early stages of animal domestication, farming, and agriculture (Beggs & Townsend, 2021). Early in the evolution of psychology, Freud observed that the presence of his dog promoted positive outcomes in his therapy sessions (Beggs & Townsend, 2021). Freud's observations led to systematic data collection on the use of dogs, with subsequent physiological data supporting a range of emotional, social, cognitive, and psychological improvements when incorporating dogs into the therapeutic process. Many studies have highlighted the benefits of using therapy animals as a complementary tool in various settings, including educational institutions, clinical environments, hospice care, and rehabilitation centers (Burr et al, 2023, Guzmán et al, 2022, Pichierri et al, 2011). AAT offers patients a nonjudgmental, safe, comfortable, and warm space. The unconditional companionship provided by animals can alleviate patients' stress, improve emotional regulation in children with emotional outbursts, and reduce motor dysfunction in the elderly (Pichierri et al, 2011). The selection of animal require a comprehensive assessment of the animals' temperament, behaviors, levels of training and suitability with the environment.

2.2 Well-Being and Age Differences

Studies on wellbeing have conceptualized it as a multidimensional evaluation, where a high level of wellbeing indicates the absence of dysfunction and the presence of positive emotions (Chutiyami et al, 2022). Mental, physical, and neurodevelopmental disorders are often accompanied by a series of life inconveniences, leading to decreased overall wellbeing. AAT have been found to improve patients' well-being by alleviating stress, strengthening motor function, facilitating physical activity and improving social interaction. Specifically, AAT can help patients with addiction, behavioral problems, stress management issues, and motor disabilities transition into a more satisfying lifestyle, promoting self-sufficiency. AAT can be implemented in various settings after familiarizing the therapy animals to the environment and to a wide range of age group to promote well-being. However, age-specific interventions and relevant characteristics of patients from different age groups should be carefully examined when incorporating AAT into therapeutic settings.

Improvement in motor skills are correlated with enhancing social communication and social interaction, improving sense of belonging, reducing loneliness and emotional distress, which are important components of well-being (Holloway & Long, 2019). One study found that patients regained motor control by performing cognitive tasks, such as reading and memorization, alongside physical training (Pichierri et al, 2011). This study was motivated by the understanding that elders require more cognitive intervention for motor disability than younger adults, who tend to rely on automatic physical responses. Elders often need additional cognitive effort to maintain motor function and balance, particularly as many suffer from dementia, Alzheimer's disease, and other conditions that further deteriorate cognitive functioning (Pichierri et al, 2011,Acevedo & Loewenstein, 2007, Rodrigo-Claverol et al, 2020). For childhood motor intervention, early childhood engagement in goal-oriented physical activities may not yield long-term motor benefits, but targeted motor interventions in autistic preschool children have shown significant improvements in body coordination and self-care skills, implying the interdependency between motor skills and social skills (Coppens et al, 2021, Jin et al, 2023). Early motor intervention for children with motor difficulties can so reduce overweight and motor deficits in later adulthood, which might reflect an Ashley of long-term benefit for childhood motor interventions. The discrepancies between motor intervention of different age group might be reflected in cognitive abilities in which elders required greater attention of cognitive improvement to restore motor function, thus it suggests that relevant interventions, such as AAT, for elders should use therapy animals

for improving cognitive engagement in the recovery process.

Mental disorders such as PTSD, depression, and anxiety can persist into adulthood, leading to long-lasting negative impacts on individuals' quality of life. However, research on age-specific interventions remains limited. Previous studies have highlighted age as a significant variable influencing patients' motivation and perception of mental health services. For instance, Ford et al. investigated satisfaction levels with mental health services across different age groups and found that older patients tended to view psychotherapy, mental health interventions and treatment more positively than younger adults (Ford et al, 2013). Younger adults, equipped with greater knowledge and understanding of mental health, are often better able to combat societal stigma and seek assistance without feeling ashamed. This trend might explain findings from a meta-analysis that revealed significantly smaller effect sizes for therapies in children and adolescents (Cuijpers et al, 2020). Perceptions of mental illness, influenced by education levels, can shape individuals' motivation and attitudes toward seeking mental health services. Elders and adults typically have greater understanding about mental illness than the youth. This might suggest that older individuals have higher mental health awareness thus feeling more positively toward mental health services. For young adolescents whose knowledge of mental illness might be limited, their can develop resistance to mental health programs. For instance, many adolescents report fears of negative interactions with therapists, confronting their emotions, and stigma, which hinder them from accessing mental health services, leading to delays and missed diagnoses (Pfeiffer & In-Albon, 2022). Despite growing awareness of mental illness in educational settings, negative social labels, such as associating mental illness with being "crazy," persist among children, indicating a need for education meaningful teaching on mental healthcare. Notably, early detection of mental health issues in children and timely intervention are crucial, as they yield the most effective outcomes. A study comparing the psychotherapy outcomes of patients from different age groups show the most significant improvements in emotional regulation, familial relationships, networking, and attention spans among children (Eadie et al, 2022). Early interventions can effectively help individuals avoid long term psychotic disorders, yet negative associations with mental illness among children and young adolescents might hinder this progress, thus mental health services target at children should educate children about mental health and foster acceptance , reducing their reluctance to engage in therapy sessions (Beckman et al, 2023).

3 AAT'S CONTRIBUTION TO SOCIAL SKILLS

The presence of animals creates human-animal bonds, which are the primary source of support for the benefits of incorporating animals into therapeutic sessions. A study recruited 48 clinically diagnosed children with ASD (4–5 years old) and compared their social interaction and communication skills between a group interacting with dolphins and a control group. The interventions were carried out by a therapist and a dolphin trainer, consisting of 45-minute sessions three times per week for each group. The control group received the same therapy sessions and physical activities only the interaction with dolphins was replaced by using a human therapist. The researcher assessed participants social communication and socialization skills by interviewing caregivers or parents, completing verbal language scales, and interacting with the autistic child. The three assessments were carried both before and after the interventions. The results showed a significant improvement in social interaction, particularly in vocalizations and gestures, among the treatment group. This improvement could be attributed to the frequent interaction and commands required during the dolphin interaction. However, no differences were observed in communication skills, as the two types of therapy differed only in the presence of the dolphin (Hernández-Espeso et al, 2021). Since all sessions involved novel environmental factors and playful activities to engage the children's motivation, improvement in social interaction might not be significant.

AAT involving dolphins are less common compared to the use of domesticated animals, the cost of using dolphins in AAT can reduce the community accessibility, thus affordability should be noted when deciding the types of animals and future research comparing the effectiveness of different types of animal use in AAT will also be important.

For older adults, a study included 50 institutionalized geriatric patients with moderate to severe cognitive impairments (aged 65 and older) and divided them into two groups (Rodrigo-Claverol et al, 2020). The experimental group participated in sessions facilitated by a family doctor who managed the dog-patient interaction with assistance from a physiotherapist and an occupational therapist

(Rodrigo-Claverol et al, 2020). These sessions were conducted in the nursing center with groups of six patients, consisting of one 60-minute session per week for 12 weeks. The treatment group will receive physiotherapy and social stimulation activities with the engagement of the animal. The control group will have the same procedure but they will not have the animal involved. The communication levels were measured by the Holden Communication Scale in which 12 times were used to assess individuals' knowledge of the environment, language use, behavioral patterns. The research also measured participants balance control, evaluating sitting and standing balance. The results indicated that AAT for older adults with moderate cognitive impairment yielded greater improvements in mobility, social communication, and interaction than severe cognitive impaired individuals (Rodrigo-Claverol et al, 2020). This suggests that AAT could serve as a non-pharmacological approach to enhancing motor control and social skills for elders, preventing risks of falls and reducing loneliness, improving daily functionings. In Richeson's nine-week pilot study using dogs in two nursing homes with 15 older adults (aged 60 and above) diagnosed with agitation issues, the researcher trained the therapeutic recreational staff at the nursing homes and asked them to complete AAT flow chart for each individual with dementia and agitation issues on a daily basis (Richeson, 2003). The AAT flow chart which measures levels of social interaction with the therapy dogs and the handler increased among the participants. However, no significant differences were found in cognitive function as measured by MMSE. Although this study included few participants, it could suggest a discrepancy between the two research, indicating further attention on the cognitive targeted AAT for elders. Pichierri et al pointed out the importance of combing cognitive task with physical exercise to enhance motor coordination, hence, future AAT can consider using therapy animals to support elders engaging in active physical tasks while integrating memorization tasks.

Notably, in these two studies, both results showed a significant improvement in social interaction, especially in improving verbal interaction and physical engagement (Hernández-Espeso et al, 2021, Richeson, 2003). Actions such as giving command, feeding, grooming, hugging involved during the AAT might contribute to these outcomes seen in both children and elder with neurodevelopment disorders. Importantly, differences in age contribute to different outcomes of the interventions with particular differences observed in the applied procedures. For example, in autistic children's study using dolphins, the settings are playful and novel to children who need greater motivation and focus to take part. Whereas for elders in nursing centers, the settings are uniform and involve fewer physical activities which is reasonable considering the physical competency. Moreover, benefits of AAT can be influenced by self-selected effect. For example, elders selected are likely to express affections for animals and this can enhance the effectiveness of treatment. For children, the selection criteria are likely to based on allergy, diagnosis, and parental consent. Importantly, discrepancies between autism and dementia are not discussed in this review, which might explain why communication benefits are seen in elders with dementia as opposed to autistic children who have experience more prominent social challenges, including repetitive behaviors and narrowed attention. These can significantly hinder the effectiveness of AAT in improving the autistic children's motor ability and subsequently contribute to decreased social connections.

4 AAT'S CONTRIBUTION TO MENTAL HEALTH

Interaction with therapy animals can ease emotional stress and anxiety by forming positive bonds between patients and the dogs, as well as with the therapist. The unconditional supportive environment generated through AAT contributes to an enhanced emotional state and reduced mental health symptoms for patients across various settings.

An exploratory study recruited ten elders with Alzheimer's disease and conducted a repeated measures experiment to evaluate pre- and post-intervention outcomes. The experiment was divided into three periods: the first two weeks involved regular treatment, the following three weeks included the use of plush dogs, and the last three weeks involved animal-assisted activities (AAA). For the AAA sessions, activities were tailored to each patient's cognitive capacity (Mossello et al, 2011). Social communication, agitation, cognitive abilities, and motor and behavioral patterns were measured for comparison before and after the plush dog and AAA interventions. After the 8-week experiment, cognitive and neuropsychiatric outcomes remained unchanged, and no significant differences were observed in agitation levels. However, the emotional state of the participants improved significantly, as indicated by reduced anxiety and sadness, and increased positive

mood. Additionally, an increase in general alertness suggested greater interest in the external environment. Traditional pharmacological approach dedicated to the psychological well-being of elders have indicated to have contribute to a wide range of negative side effects despite achieving similar outcomes. The presence of animals has shown to increase positive moods of elders who continue taking pharmacological treatments. It could mediate the negative effects of drugs while enhancing physical and emotional well-being. Despite these emotional improvements, AAT did not reduce depressive symptoms, although a single-time analysis of the neuropsychiatric scale revealed reduced anxiety levels after the sessions. Therefore, researchers should distinguish between emotional improvements and mental health disorders when evaluating the effects of AAT on mental well-being. Furthermore, Mossello et al.'s results did not show a significant improvement in cognitive function, highlighting an important area for further enhancement in future AAT implementations. At the same time, the finding also suggested that AAT needs to collaborate with other types of treatments, such as reading, cooking, drawing, medication, and other psychosocial therapy in order to enhance elders' physical and psychological health.

In pediatric mental health services, AAT has also demonstrated improvements in mental health and emotional regulation among children with various mental health disorders. Guillen Guzmán et al. conducted a two-year-long study on dog-assisted therapy in a children's day hospital. All participants were under 13 years old, and their emotional and behavioral outbursts, as well as attendance rates, were assessed before and after the intervention (Guzmán et al, 2022). The researchers conducted qualitative interviews with healthcare professionals and measured emotional and behavioral data, and rate of engagement in quantitative form using the Social Responsiveness Scale-2 (SRS-2) and the Self-Control Rating Scale (SCRS). During the dog-assisted therapy sessions, a dog handler and a staff member from the day hospital facilitated the sessions, with a research team member tracking progress. Quantitative results showed a significantly higher attendance rate on days when dog-assisted therapy was conducted. Additionally, emotional and behavioral outbursts were significantly lower after the therapy sessions (Guzmán et al, 2022). Qualitative interviews revealed that professionals found dog-assisted therapy helpful for approaching children with high levels of anxiety and for building therapeutic connections. Children who received dog-assisted therapy appeared calmer and more motivated to participate in therapy sessions. However, according to parental interviews, no significant behavioral differences were observed outside the therapy setting. Similar to Mossello's study, a reduction in anxiety levels was noted in children at the day hospital. Reports from professionals suggest that AAT improves motivation and engagement while fostering trust during therapeutic sessions. However, these positive behavioral changes did not extend beyond the day hospital setting. Moreover, it remains unclear whether the positive changes last over the long term, as the effects were measured shortly after the interventions.

In children's treatment involving therapy animals, as illustrated by Guillen Guzmán et al., the focus is on encouraging motivation and fostering connections with the therapist among children with neurodevelopmental and mental disorders (Guzmán et al, 2022). The goal of AAT is to improve mental well-being through human-animal interactions. Although the ultimate goal is the same across age group, AAT approaches patients differently based on individual needs and age differences. For elders, who often struggle with mental health problems, emotional distress, and agitation, these issues are often related to unmet needs instead of the disorder itself (Richeson, 2003). For instance, dementia and Alzheimer's disease, which are common in elders, can lead to motor and cognitive dysfunction as well as adverse effects on mood regulation. These symptoms of aging are often linked to unmet physical and psychological needs, which can be moderated by manipulating the environment, such as providing emotional comfort and support through AAT. By fulfilling elders' emotional needs with the companionship of therapy animals, psychological stress can be reduced. For children, AAT focuses more on fostering a proactive attitude toward mental health services. Building this mindset in children encourages trust in their therapist and facilitates connections, which contributes to more effective intervention outcomes, such as reduced emotional outbursts and anxiety attacks. Unlike elders, whose mental health issues are typically related to natural aging, children receiving AAT often experience neurodevelopmental deficits, such as ASD and ADHD, which can persist into adulthood. Early intervention for children at mental health risk can prevent the exacerbation of symptoms and reduce treatment difficulties in adulthood. The goal of treatment is to encourage children to actively engage in therapy, aiding in self-regulation and emotional management so that, in later years, they will have the

cognitive and social capacity to support themselves and the willingness to seek professional help when needed.

5 DISCUSSION

The current review sought to understand the differences in AAT procedures when accounting for age variations and how AAT enhances the social functioning and psychological health of individuals with mental health, cognitive, or neurodevelopmental disorders, such as dementia, depression, and ASD. The researcher noted three unresolved questions after analyzing the selected articles. The first issue is the lack of cognitive improvement among cognitively impaired elders with dementia and Alzheimer's. Although implementing AAT resulted in positive mood and motor improvements, the results in cognitive improvement were not significant, which can hinder the effectiveness of treatments for elders who tend to suffer from cognitive dysfunction (Rodrigo-Claverol et al, 2020). Cognitive impairment can be reflected in brain activities, including memory retention, attention span, processing speed, and orientation. The relationship between brain areas and cognitive impairments is worthwhile to study as it offers insight into the specific brain areas stimulated during engagement with therapy animals. Therefore, based on previous research, future studies could measure the brain functionality of older adults while performing cognitive tasks, such as the Stroop Task, and interacting with therapy animals to develop a clearer understanding of the benefits of AAT in enhancing cognitive abilities."

The second issue is the lack of long-term investigation into the benefits of AAT on the well-being of individuals, especially among children. The main purpose of conducting early interventions for children with risky behaviors and emotional regulation issues is to prevent persisting symptoms and reduce recurring issues in adulthood. However, many studies do not indicate the long-term benefits of AAT, possibly due to the approaches taken in measurement and the cost of hiring handlers and caring for therapy animals. While children participating in AAT demonstrate immediate social and emotional improvements, these effects do not extend beyond therapy settings, let alone persist throughout their lifespan (Guzmán et al, 2022). The length of time required for AAT to solidify positive outcomes in children with ASD or other mental health issues should be explored further. Specificity, when conducting longitude studies the researcher should carefully control the variables to minimize the influence of third variables on the outcomes.

The last issue is the involvement of healthcare professionals in the treatment process. Since AAT can be applied in various settings, therapists must educate other healthcare professionals in these institutions to ensure an effective process. Additionally, therapists without certified animal-assisted therapy licenses may have to work simultaneously with handlers. The involvement of different professionals in the treatment process can interfere with the formation of animal-human bonds. Patients might struggle to form in-depth connections with the therapy animal or engage effectively with the therapist due to the presence of multiple staff members. Future research could explore whether the number of people present influences the bond-forming process between the animal and the patient by assessing patient satisfaction levels, memorization of the external environment, or using brain imaging techniques to compare variations in brain activity when interacting with a therapist alone versus with multiple healthcare staff.

6 CONCLUSION

The second issue is AAT has significantly advanced the fields of medicine and psychology. When integrated with traditional treatment methods, AAT enhances the well-being of individuals with various disorders. The current review explored the differences in applying AAT across age groups, including children, adolescents, adults, and elders. Furthermore, it examined how AAT improves the well-being of these groups by analyzing psychological and social outcomes following therapy sessions. Improvements in anxiety levels, positive emotions, and reductions in negative social behaviors were observed across all age groups. However, the focus of AAT differs based on age. For younger children and adolescents, who often have limited awareness of mental health and reduced social interaction skills due to challenges with self-regulation, AAT primarily targets motivation and the development of self-regulation skills. In contrast, for elders, AAT focuses more on addressing unmet emotional needs to enhance their well-being. The types of tasks also vary by age. Elders typically engage in calmer activities with therapy animals, while children often participate in more physically demanding tasks. Despite these benefits, the research and application of AAT, such as insufficient professional presence during sessions, a lack of long-

term research methodologies, and limited cognitive emphasis in both studies and applications. These findings highlight the need for more multidisciplinary research to optimize and expand the scope of AAT.

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