

The Effects of Animal-Assisted Therapy in Dogs on Depressed Patients

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Abstract: Depression has emerged as one of the most widespread health concerns in contemporary culture. In addition to pharmacological interventions, psychological counseling, physical therapies, and animal-assisted therapy (AAT), which frequently employs dogs, these modalities are commonly utilized in hospitals, psychotherapy centers, and social welfare agencies for the treatment of individuals with mental health issues. This research presents a systematic literature review on the utilization of dogs for the treatment of depression. The age range of the depressed patients examined in this article encompasses children, teenagers, and elderly adults. The result shows AAT in dogs has different impacts for diverse aged depressed patients, older adults have the most significant effect, through high frequency and stable period's looking at, talking to, or playing or walking with them; conversely, children and adolescents have varied outcomes on depression from slight to significant. Future research should investigate the efficacy of dog-assisted therapy, especially for elderly individuals.

Keywords: Dog-assisted Therapy, AAT, Depression, Adolescents, Older Adults.

1. Introduction

Since prehistoric age, humans and animals have shared a deep bond, with animals improving the quality of humans' lives[1]. Engaging with animals elicits a favorable physiological response in individuals, attributed to an elevation in beta endorphins or dopamine production, as demonstrated by prior research[2, 3]. Archaeological evidence indicates that the evolution of humans and dogs were the fundamental ones[4]. For decades, dogs have been used by many guardians in therapeutic places. For instance, in the 1930s, a Chow Chow was discovered that it can help patients reduce tension and stress in his psychotherapy sessions, and the patients became closer friends with Jofi[5]. AAT is a planned, goal oriented, and documented therapeutic intervention. In this intervention, animals that meet specific requirements are a fundamental component of the treatment process. This intervention is carried out by health and human service professionals[6]. Depression is a high burden of disease, and it affects people in their lives in many different ways. Influences in social status or education, changes in mood and behavior, crucially depression has high risk associated with suicide[7][8][9]. While specific antidepressant medications and psychological counseling remain the predominant treatments for depression, AAT is gaining traction in healthcare, with dogs being the most prevalent companion animals and a favored option[9][10][11]. When they interact with animals, they could achieve a large variety of benefits, psychological and physical[12]. Many people who suffer from

depression may find it difficult to trust or form attachments to others due to a variety of life situations. AAT provides good relief from these issues; patients have been found to confide in animals and feel much more comfortable doing so[13]. Because of their unconditional positive regard and nonjudgmental, nondiscriminatory nature, animals can help depressed individuals feel more confident and good about themselves. They can also give them a sense of purpose[14]. This article's purpose is to determine AAT's effects in dogs on various age-depressed patients based on research findings and existing literature. It also gives the medical community additional options for treatment options beyond antidepressant medication and psychological counseling.

2. Method

The study was conducted as a systematic literature review, where selected studies were critically reviewed to address the research question. The literature search was performed using one journal database, Google Scholar, which provides a wide range of peer-reviewed primary journal articles on animal-assisted therapy, particularly those involving dogs and mental health issues such as depressive symptoms. The search terms are: "animal-assisted therapy," "depression," etc. 23 articles could be found. However, the research range was too broad in these 23 articles. The keyword range has been compressed to a certain extent. Finally, 6 articles including these search terms could be found, 3 for children and adolescents, and 3 for older adults. Inclusion and exclusion criteria were established based on factors such as the year of publication, the language of publication, the population of focus and intervention, and the type of resource. Only studies published in the last 6 years were included, to minimize the differences in results as much as possible, in case the experiments were updated in a long time. Thus, studies published earlier than 2019 were excluded from the review. Secondly, the review exclusively encompassed papers published in English to mitigate translation-related problems. The key population of focus was depressed individuals who were children, adolescents and older adults, and the key intervention was AAT in dogs. Studies based on other populations and conditions were excluded. Also, studies that do not include AAT in dogs for depressive symptoms as intervention were excluded. Finally, 6 articles were analyzed and the organized contents in each article included: 1)the type of the study; 2)the study topic in this article; 3)the population in the study; 4) the study design; 5)the study number the article included; 6)including tools for bias and results analysis; 7)the results about depression.

3. The Effects on Depressed Patients

3.1. Children and Teenagers

In 2021, Feng conducted a systematic analysis. This analysis includes 8 studies. The research focuses on individuals aged 3-18. There are a total of 348 people. These patients are housed in different wards, including outpatient and emergency departments. The author's aim is to investigate the effects of AAT on pain, anxiety, sadness, stress, blood pressure, and heart rate in hospitalized children and adolescents. This study includes 4 randomized controlled trials (RCTs) and 4 quasi experimental studies. Dog-assisted therapy was implemented in the intervention group; participants could brush, pet, feed, dress, talk to and play with the dogs, take pictures with the dogs, view the pictures, and discuss their history. RevMan software was used for the analysis, and data extraction adhered to these rules. AAT had statistically significant impacts on them, primarily those with cancer, according to pooled results from three studies including 148 individuals. Significant variability was observed ($Q = 7.36$; $P = 0.03$; $I^2 = 73\%$). After the exclusion of one trial, the two remaining studies exhibited no statistically significant heterogeneity ($Q = 0.68$; $P = 0.41$; $I^2 = 0\%$). Nonetheless, based on two studies (SMD = -0.18; 95% CI, -0.50 to 0.13; $P = 0.26$; medium-quality evidence), AAT did not exhibit a statistically significant positive impact on depression in the random-effects model[15].

Trujillo, K.C. conducted an exploratory experiment in 2020. This study used the Wilcoxon rank sum test and student t-test to evaluate differences. Specifically, the experimental subjects include 31 adolescents between the ages of 12 and 17 who suffer from mental and material use disorders. The purpose is to divide the experiment into two control groups; one group received AAT and the other group did not. The experimental results showed that the AAT group (n=14) received treatment from a licensed treatment dog (an 8-year-old Labrador Retriever), while the control group (n=17) received treatment without AAT. The outcome indicators include the number of courses attended, the percentage of urine drug tests negative for substances other than nicotine, etc. Data analysis was performed using SAS Enterprise Guide 5.1., with a Bonferroni-adjusted p-value of 0.0125 to reduce the risk of false positives. According to the results, participants who got AAT treatment (M = 9.9, SD = 3.2) attended significantly more therapy sessions over the course of 16 weeks ($\beta = 3.5$, $t(1) = 2.89$, $p = 0.0072$) than those who did not receive AAT treatment (M = 6.4, SD = 3.5). Furthermore, general wellbeing improved more in the AAT group (Mdn = 2.9, IQR: 1.8, 5.0) than in the therapy group without AAT (Mdn = 0.5, IQR: -2.6, 1.4) ($\beta = 3.6$, $t(1) = 3.74$, $p = 0.0009$)[16].

This 2019 study by Jones, M. G. aimed to determine the characteristics of Canine-Assisted Psychotherapy (CAP) therapies, as well as their effects, acceptability, tolerability, and practicality for adolescents aged 10 to 19 with mental health disorders. This review comprised seven trials with different forms, venues, dosages, and facilitators for the interventions. There was little information available regarding the dogs' function throughout sessions. The reviewed studies' findings were: Using the brief Centre for Epidemiologic Studies Depression Scale (CESD), Hamama and Hamama-Raz evaluated depression and found no discernible decrease in depression after the intervention ($p = 0.063$). Although no significant changes were observed between the groups, a different study (Hartwig) that used the Beck Depression Inventory (BDI) indicated a substantial decrease in depression from the pre- to post-test in both the intervention (with AAT) and comparison (without AAT) groups. Using the BDI, Hanselman evaluated depression and discovered that mean depression levels significantly increased from before to after the intervention, with findings staying in the "moderate" range[17].

3.2. Older Adults

This 2021 study by Chang, S. J., sought to investigate the applications of AAT in older persons, examining its health impacts and offering evidence for future interventions. The target demographic comprised adults aged 60 and above. The study employed either an experimental design or a quasi-experimental design. A meta-analysis determined the effect size of depression after data were evaluated using a narrative synthesis that was carried out using data gathered from the included studies. All included research were evaluated using the Joanna Briggs Institute's structured critical assessment procedures to mitigate the potential for bias. Forty-seven studies were chosen for analysis. About 57.4% selected dog(s) as an intervention animal, and when it came to dogs, the research concentrated on activities and interventions like walking and exercise. 34.0% of interventions were given once a week. AAT markedly diminished depression in older individuals, as evidenced by 15 effect sizes derived from 14 studies assessing depression as an endpoint (SMD = -1.310; 95% CI [-1.900, -.721]; $p < .001$; $I^2 = 1.149$; $Q = 115.657$; $df = 14$; $p < .001$). Overall, the depression score decreased significantly in seven out of fifteen outcomes. One possible explanation for this is that spending time with animals may evoke or produce positive memories rather than lessen unpleasant ones[18].

In 2024, Villarreal-Zegarra performed a thorough review and meta-analysis aimed at comparing the effectiveness of pet-robot interventions (PRI) and AAT in reducing depression among older adults through randomized controlled trials (RCTs). This study conducted a systematic review in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The

interventions were used with the dogs ($n = 16$) in their session. The study population consisted of individuals aged 65 years or older, regardless of the presence of a clinical condition, and included those with a clinical diagnosis established through mental examination, testing, or verification from medical records, along with accreditation from the facility's staff. It comprised trials where an active or passive intervention served as the comparator. This systematic review encompassed 23 studies, whereas the meta-analysis incorporated 19 trials. 78.9% of the studies ($n = 15$) had a high overall risk of bias. Although PRIs showed no substantial impact, AAT ($g = -0.72$; 95%CI -1.13 to -0.31 ; $p = 0.001$) demonstrated a modest and statistically significant benefit as an intervention for alleviating depressive symptoms in older adults. Additionally, a sub-analysis focusing on a specific type of animal-assisted therapy known as dog-assisted therapy ($g = -0.65$; 95%CI -1.21 to -0.08 ; $p = 0.025$) indicated a modest decrease in depressive symptoms[19].

This 2020 review by Borgi, M. sought to perform a meta-analysis of all prospective controlled trials assessing the impact of dog visitation on depression symptoms in older individuals. This review exclusively included trials with participants aged above 55 years. The meta-analysis confirmed that after an AAI, changes in depressive symptoms were assessed using certain rating measures. The standardized mean difference (SMD) was used in this work to determine the effect size for each individual comparison. The Egger's test, which regresses the standardized effect (effect size divided by standard error [SE]) on precision (inverse of SE), was used to evaluate publication bias. Additionally, Comprehensive Meta Analysis Version 3.0 was used for statistical analyses, with a significance level of $p < .05$. The included studies vary significantly in terms of sample size, methodological quality, and other important characteristics. Despite this methodological diversity, the results all point to a positive and substantial overall impact of dog-visiting interventions on depression symptoms when compared to a control condition (SMD = -1.002 , 95% CI = $0.547-1.455$, $p < .001$)[20].

4. Results and Discussion of Review Bias

Results show in 3 studies for children and adolescents, there is one study that totally shows having benefits on well-being after participants receiving AAT in a dog; another two studies both indicate there are significant or slight effects on depression after AAT in dogs, and some results show having a significant increase in depression after therapy. For another 3 studies about older adults, all of these indicate there is a moderate or significant reduction in depression after AAT. However, bias in some studies makes the results have shortcomings. The study by Trujillo, K. C., because the details and focus on depression were less, the subjects were only divided into two parts---psychiatric and substance use disorders, and more conclusion was just about overall well-being and improvement in school engagement; it is a weak reference for this topic; the study by Chang, S. J., only 57.4% of studies used dogs in the interventions, and only 16 dogs were involved in the interventions of studies in the study by Villarreal-Zegarra, D., so the final results may have uncertainty whether they included dogs in interventions. Whatever, the results about children and adolescents have more differences, but in older adults, the results all show benefit on depression after receiving AAT in dogs.

5. Conclusion

This study review through several articles shows AAT especially dogs, having different impacts on children, adolescents and older adults who have depressive symptoms. Especially when dogs join in people's lives, the high frequency of interaction between humans and animals can improve people's mental health because of the increase in pleasant memories and the reduction in negative memories. In the future, AAT in dogs on depressive symptoms has a hope that can be applied to older adults, besides some common treatments such as the use of antidepressant medication and counseling

treatment. Meanwhile, we still have to proceed with more studies for getting more reference value to make sure whether AAT in dogs for children and adolescents has significant benefits on depressive symptoms.

References

- [1] Rodríguez-Martínez, M. D. C., De la Plana Maestre, A., Armenta-Peinado, J. A., Barbancho, M. Á., & García-Casares, N. (2021). Evidence of animal-assisted therapy in neurological diseases in adults: a systematic review. *International journal of environmental research and public health*, 18(24), 12882.
- [2] Odendaal, J. S., & Meintjes, R. A. (2003). Neurophysiological correlates of affiliative behaviour between humans and dogs. *The Veterinary Journal*, 165(3), 296-301.
- [3] Villafaina-Domínguez, B., Collado-Mateo, D., Merellano-Navarro, E., & Villafaina, S. (2020). Effects of dog-based animal-assisted interventions in prison population: A systematic review. *Animals*, 10(11), 2129.
- [4] Santaniello, A., Garzillo, S., Cristiano, S., Fioretti, A., & Menna, L. F. (2021). The research of standardized protocols for dog involvement in animal-assisted therapy: a systematic review. *Animals*, 11(9), 2576.
- [5] Winkle, M., Johnson, A., & Mills, D. (2020). Dog welfare, well-being and behavior: considerations for selection, evaluation and suitability for animal-assisted therapy. *Animals*, 10(11), 2188.
- [6] Fine, A. H. (Ed.). (2010). *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. academic press.
- [7] DALYs, G. B. D., & Collaborators, H. (2016). Global, regional, and national disability-adjusted life-years (DALYs) for 315 diseases and injuries and healthy life expectancy (HALE), 1990-2015: a systematic analysis for the Global Burden of 404 Disease Study 2015. *Lancet*, 388(10033), 1603-1658.
- [8] Marwaha, S., Palmer, E., Suppes, T., Cons, E., Young, A. H., & Uptegrove, R. (2023). Novel and emerging treatments for major depression. *The Lancet*, 401(10371), 141-153.
- [9] Cuijpers, P., Stringaris, A., & Wolpert, M. (2020). Treatment outcomes for depression: challenges and opportunities. *The Lancet Psychiatry*, 7(11), 925-927.
- [10] Lundqvist, M., Carlsson, P., Sjö Dahl, R., Theodorsson, E., & Levin, L. Å. (2017). Patient benefit of dog-assisted interventions in health care: a systematic review. *BMC complementary and alternative medicine*, 17, 1-12.
- [11] Fine, A. H. (Ed.). (2019). *Handbook on animal-assisted therapy: Foundations and guidelines for animal-assisted interventions*. Academic press.
- [12] Nagasawa, M., Kikusui, T., Onaka, T., & Ohta, M. (2009). Dog's gaze at its owner increases owner's urinary oxytocin during social interaction. *Hormones and behavior*, 55(3), 434-441.
- [13] Covert, A. M., Whiren, A. P., Keith, J., & Nelson, C. (1985). *Pets, Early Adolescents, and Families*. *Marriage & Family Review*, 8(3-4), 95-108.
- [14] Jorgenson, J. (1997). Therapeutic use of companion animals in health care. *Image: The Journal of Nursing Scholarship*, 29(3), 249-254.
- [15] Feng, Y., Lin, Y., Zhang, N., Jiang, X., & Zhang, L. (2021). Effects of animal-assisted therapy on hospitalized children and teenagers: A systematic review and meta-analysis. *Journal of Pediatric Nursing*, 60, 11-23.
- [16] Trujillo, K. C., Kuo, G. T., Hull, M. L., Ingram, A. E., & Thurstone, C. C. (2020). Engaging adolescents: Animal assisted therapy for adolescents with psychiatric and substance use disorders. *Journal of Child and Family Studies*, 29, 307-314.
- [17] Jones, M. G., Rice, S. M., & Cotton, S. M. (2019). Incorporating animal-assisted therapy in mental health treatments for adolescents: A systematic review of canine assisted psychotherapy. *PloS one*, 14(1), e0210761.
- [18] Chang, S. J., Lee, J., An, H., Hong, W. H., & Lee, J. Y. (2021). animal-assisted therapy as an intervention for older adults: A systematic review and meta-analysis to guide evidence-based practice. *Worldviews on Evidence-Based Nursing*, 18(1), 60-67.
- [19] Villarreal-Zegarra, D., Yllescas-Panta, T., Malaquias-Obregon, S., Dámaso-Román, A., & Mayo-Puchoc, N. (2024). Effectiveness of animal-assisted therapy and pet-robot interventions in reducing depressive symptoms among older adults: A systematic review and meta-analysis. *Complementary Therapies in Medicine*, 103023.
- [20] Borgi, M., Collacchi, B., Giuliani, A., & Cirulli, F. (2020). Dog visiting programs for managing depressive symptoms in older adults: a meta-analysis. *The Gerontologist*, 60(1), e66-e75.