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Is Animal Assisted Therapy with Dogs Effective in Improving Psychosocial Variables of Mood in Hospital Patients?

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For The

Degree of Master of Science

In

Health Sciences – Physician Assistant

Department of Physician Assistant Studies
Philadelphia College of Osteopathic Medicine
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ABSTRACT

Objective: The objective of this selective EBM review is to determine whether or not animal assisted interventions with dogs are effective in improving psychosocial variables of mood in hospital patients.

Study Design: Review of two English language randomized control trial published in 2008 and 2007, and one English language clinical trial published in 2009.

Data Sources: Two randomized, controlled trials comparing animal assisted interventions to absent animal interaction, interaction with a human being, engaging in another interactive activity, or no treatment were found using PubMed and Cochrane System Reviews.

Outcomes Measured: Anxiety was measured by POMS (Profile of Mood States) and the Speilberger State- Trait Inventory test. Mood improvement was analyzed through various patient exit questionnaires that addressed patient perception of energy level via VAS (Visual Analog Scale) patient perception of pain via VAS (Visual Analog Scale), Session helpfulness perceived by patient via end of study questionnaires or feedback forms.

Results: A RCT by Cole et al, determined that there was significant improvement in anxiety within the dog therapy treatment group consisting of a hospital volunteer and dog when compared to those patients receiving a visit from a hospital volunteer only. In a clinical trial by Coakley et, al, AAA (Animal Assisted Activity) was found to show significant quantitative and qualitative findings providing support for decreased tension, anxiety, fatigue, and improved overall mood with AAT based on POMS scores. However in a study by Johnson et. Al, no significant changes were found regarding mood variables via the POMS test since all p-values were greater then 0.05

Conclusions: The results of one of the randomized control trial and one clinical trial demonstrate that animal assisted interventions with dogs can improve psychosocial variables of mood within the treatment groups. One RCT demonstrates the dog interventions improved psychosocial variables of mood when compared to the control groups.

Key Words: Animal Assisted Therapy (AAT), Mood, Depression, Anxiety, Dogs, and Patients

INTRODUCTION

Mood is described as a prolonged subjective emotional state that influences one's whole personality and perception of the world.¹ Many factors are attributed to mood such as anxiety, stress, depression, energy level, and an individual's perception of themselves. Various factors go into determining an individual's mood; it is a combination of biological and psychosocial factors. Biological factors include genetic, chemical, neurological, and physiological components.¹⁰ Whereas psychosocial variables of mood include personality traits, cognitive styles, social supports, and the ability to deal with stressors in life.¹⁰ Psychosocial factors represent both the psychological and social aspects of mental health.⁹

For those individuals that are receiving care for a specific ailment, hospitals can be a lonely and stressful place as they are often compromised by their illness and possibly separated from family or friends.⁵ Mood can be affected regardless if a condition is acute or chronic which may lead to mental health problem such as depression. As mentioned before, an individual's disposition or surroundings that are found in a health care setting are often upsetting to patients and become a wall in terms of their outlook on their condition. Depression is often a comorbidity to disease especially those that are chronic such as cancer, heart disease, neurologic disorders, respiratory disorders, and diabetes.⁸ Additionally acute problems can also lead to depression especially myocardial infarctions.⁸ Studies show that untreated depression in a patient who is post-MI may result in higher mortality rates for up to 12 months.⁸ The stressors that a patient experiences while some one is receiving care at a hospital may lead to poor treatment outcomes, increased stay, complications, and further health concerns.

Currently there is no specific strategy, medication, counseling, or intervention in place for monitoring mood status in hospitalized patients. In order to reduce stress experienced and

depressed mood by patients, some hospitals have incorporated complimentary therapies such as music, mind body interventions, and pets (AAT/AAA) to help patients cope with being in a hospital setting.⁵ Little is known about the overall benefit some one may have after being treated with an intervention in the form of animal therapy or activity namely with dogs since it is still relatively new. However, studies have shown that interaction with a pet such as dog can promote positive emotions and the animal's presence may reduce anxiety, and lower human neurohormone levels, enhancing healing and recovery.³

Animal Assisted Therapy (AAT) is a goal-directed intervention directed and/ or delivered by a health/human service professional with specialized expertise, and within the scope of practice of his/her profession.² AAT is designed to promote improvement in human physical, social, emotional, and/or cognitive functioning.² AAT should not be confused with AAA (Animal Assisted Activities) which are basically casual meet and greet activities that involve pets visiting and can be repeated with many people unlike therapy that is tailored to a specific medical condition.²

Since mental health concerns have the possibility to affect any individual receiving care over an extended period of time at a hospital, this paper does not specifically address one illness or disease, therefore matters of cost and number of healthcare visits per year are not included. Although two of the studies chosen in this paper included patients who were receiving treatment for specific comorbidities, such as cancer and heart failure, the main goal is to review the effectiveness of an animal intervention with a dog through AAT/ AAA regardless of disease state or condition. According to literature in the past decades utilizing dogs has been beneficial to patients of all types especially in intensive care settings, pediatrics, those with spinal cord injuries, and the elderly.⁷

This paper focuses on therapies utilizing specifically dogs in comparison to those with human interaction, activities, or no intervention at all through evaluating two RCTs, and one clinical trial for improving variables of patient mood, namely anxiety and depression.

OBJECTIVE

The objective of this selective EBM review is to determine whether or not Animal Assisted Therapy with dogs is effective in improving the psychosocial variables of mood in hospital patients.

METHODS

The three studies analyzed in this review met the following criteria. The population included English-speaking adults 18 and older that were receiving treatment in a hospital setting and were not allergic to dogs. In the two RCT studies the comparison groups to AAT or AAA with dogs included similar participants who either received therapy with human interaction, therapy-utilizing activities alone such as silent reading or no therapy intervention at all. The third study was a clinical trial so it focused on the before and after of a therapeutic intervention with dogs within that group of participants.

A detailed search was done utilizing PubMed, Medline, and EBSCOhost databases by the author using the key words, “Animal Assisted Therapy,” “dogs,” “mood,” “anxiety,” “depression,” and “patients.” Inclusion criteria of studies consisted of articles published in peer-reviewed journals during 1996 or later, and included POEMs. Exclusion criteria were articles published before 1996, review articles, meta analysis and systemic reviews. Two RCTs and one clinical trial were selected and included in this review based on the above-mentioned criteria. A summary of statistics reported or used included RRR, ARR, NNT, NNH, paired T tests, change

in mean from baseline, and p- values. Table 1 displays the demographics and characteristics of these articles.

Table 1. Demographics and Characteristics of Included Studies

| Study | Table | #pts | Age (yrs) | Inclusion Criteria | Exclusion Criteria | W/D | Interventions |
|-----------------------------|----------------|------|-----------|---|---|-----|---|
| Johnson ¹ (2008) | RCT | 30 | 39-71 | English speaking adults 18 and older with no known pet allergies, beginning non palliative radiation therapy for cancer for at least 4 weeks | Patients receiving radiation therapy for metastases | 0 | Being randomly assigned to receive 12 dog visits over a four week period. |
| Coakley ² (2009) | Clinical Trial | 61 | 24-88 | Inpatient or outpatient treatment being received | Patient had dog allergies, fear of dogs, or uncovered open wounds. In addition to infection control exclusionary factors included those such as TB, immunosuppression, hepatitis, salmonella, FUO, communicable viruses, and staph aureus | 2 | Pet therapy program utilizes volunteer handlers and own dogs to visit patients for an average of 10 minutes |
| Cole ³ (2007) | RCT | 76 | >18 | Advanced heart failure (inc. systolic and diastolic left ventricular dysfunction) requiring medical management and pulmonary catheter. Ages 18-80. Able to read, write, and speak English. Mental status AAO to place, person. Time. SVR > 1200dyne sec cm (-5) at least once w/in 12 hours from start of data collection | SVR < 1200 dyne sec cm. Allergies to dogs, immunosuppression, infection indicated by an increase in WBCs, body temp greater than 38C, decreased level of consciousness. | 0 | 12 minute hospital visit with a therapy dog |

OUTCOMES MEASURED

The outcomes in the selected studies were based on various paper surveys that patients filled out such as questionnaires, or “personal inventories” in regards to mood at time of study. Outcomes measures in each were based on POEMS (Patient Oriented Evidence that Matters) and focused on variables of mood and its improvement and perceived effectiveness of interacting with dogs as a form of treatment. Mood has been previously defined as an emotional state that effects one’s perception of self and the world around them composed of many variables.¹ Self perceived health is the extent to which people believe they are healthy in relation to the past or some one their own age for example.⁷ Effectiveness in this review refers to whether or not the patient admitted to feeling better after an animal assisted

Patient perception of anxiety was measured using the Speilberger State-Trait Anxiety Inventory form Y-I that is a self-report questionnaire that asks participants about their feelings of anxiety, “right now.”⁶ It consists of 20 statements such as, “I feel at ease,” for example and patients would rate themselves on a 4-point scale of increasing intensity.⁶ Patient anxiety and depression in regard to their perceived mood state was measured through the Profile of Mood Survey or POMS where participants are asked to respond to a 65 item instrument consisting of adjectives that reflect current mood on a 5-point Likert-type scale in two of the studies⁵ Choices ranged from not at all (0) to extremely (4). The quantitative data from POMS was then analyzed using SPSS-15 and a paired t test was used to analyze pre and post quantitative data.⁵ The Wilcoxon sum rank test was used for variables on an ordinate scale to compare group median difference scores and identify whether the dog visit showed significant improvement over human interaction, activities, or the control. A significance level of $p < 0.05$ was set for determining significance. Two different exit interview questionnaires were also utilized. In the clinical trial

the exit interview presented as three open-ended questions regarding patient experience and perception of treatment with the dogs.⁵ Whereas in the RCT study the questionnaire was in the form of six multiple choice questions assessing present health and emotional state. Difference scores were then calculated by subtracting the pretest scores from the post-test scores.

RESULTS

In this systemic review two randomized control trials and one clinical trial compared animal assisted therapy/activities utilizing dogs and their service professional, to those with simply another individual present, “therapeutic activities” such as reading or drawing, and no interventional treatment. The amount of time the patient spent with the dogs differed not only in regards to how long the patient interacted with the dog, but also the length of the treatment in regards to recurring sessions (Table 1).

Coakely et al compared the mood state of 59 patients before and after they had a therapeutic session with a dog for 10-minute session. These sessions were offered twice a week but participants were only evaluated on their first initial visit and occurred between September 2004 and July 2007.⁵ The outcomes measured were mood state through POMS before and after the dog intervention and analyzed using SPSS version 15.⁵ A paired t- test was used to analyze pre and post quantitative data from the POMS test. Experimental wide alpha was set at $p < 0.05$ such that each test had to reach a level of $p < 0.004$ to be considered significant.⁵ Significant difference between pre and post test mood states were found through POMS, especially in specific subscales of mood namely tension/anxiety, anger/hostility, fatigue/inertia, depression/dejection and total mood disturbance (TMD) which are seen in Table 2.⁵

Table 2: Comparison of POMS Scores at Baseline and Post Dog Assisted Session

| Variable | Pre-test/Mean (SD) | Post-Test/Mean(SD) | Difference | <i>t</i> | <i>p</i> ^a |
|-----------------------------|--------------------|--------------------|------------|----------|-----------------------|
| Tension/anxiety | 5.11 (4.38) | 2.41 (3.38) | -2.70 | 6.10 | 0.000 |
| Anger/hostility | 2.48 (4.10) | 0.89 (1.90) | -1.59 | 3.28 | 0.001 |
| Fatigue/ inertia | 7.62 (5.33) | 4.67 (4.62) | -2.95 | 5.74 | 0.000 |
| Depression/dejection | 3.98 (4.73) | 2.08 (3.47) | -1.90 | 3.47 | 0.000 |
| POMS total mood disturbance | 17.16 (21.01) | 7.30 (16.07) | -9.86 | 4.24 | 0.000 |

In Cole et al, a randomized control trial utilizing 76 patients with advanced heart failure in a 3-group repeated measures experiment design. Longitudinal analysis was used to model differences among the 3 groups at 3 times. All groups had a 12 minute session, however one group had that session with a therapy dog and their professional, one group had a 12 minute session from an individual such as a hospital volunteer, and the last group was the control and they continued to receive care without any therapeutic intervention. After the intervention the dog group showed a significant decrease from baseline in state anxiety sum score compared to the volunteer group and the control. Through use of the Spielberger State-Trait Anxiety Inventory form a state anxiety sum score was formed and analyzed. In Table 3, the adjusted mean difference (SD) and p values are shown, significance was determined by a p value <0.05.

Table 3: Differences Between Groups in Decreases in Each Dependent Variable From Baseline to After the Intervention.

| Variable | Volunteer-dog vs control | Volunteer-dog vs volunteer-only |
|----------------------------------|--------------------------|---------------------------------|
| Adjusted Mean Difference (SD), P | | |
| Anxiety, sum score in units | -9.13 (2.10) <0.001 | -6.65 (2.13) 0.002 |

Lastly, the randomized control trial done by Johnson et al, compared 30 patients undergoing palliative radiation therapy that were randomly assigned to one of three treatment

groups. The intervention group received a visit from a dog and their handler for 15-minute sessions, three times a week for four weeks.⁷ This total of 12 sessions was compared to other two groups of patients who were either assigned to sessions with a human or sessions involving quiet reading.⁷ Outcomes measured in this study were mood, self improved health, sense of coherence, and perceived helpfulness of interventions; with only mood applying to the POEM being addressed in this paper. Difference scores were calculated for mood (including anxiety, depression, fatigue, tension, and vigor) by subtracting pretest POMS scores from posttest scores.⁷ The Wilcoxin sum rank test was used for variables measured on an ordinal scale to compare group median difference scores and identify whether the dog, human, or reading sessions had any affect.⁷ A significance level of $p < 0.05$ was set for determining significance. As shown in Table 4, no statistically significant differences existed within or between groups for mood.⁷

Table 4: Profile of Mood States Difference Scores

| Variable | Dog Visits (score/ p) | Human visits (score/ p) | Reading (score/ p) |
|------------|--------------------------|----------------------------|-----------------------|
| Tension | -0.25/0.90 | -2.60/ 0.22 | -1.71/0.56 |
| Anger | 2.30/0.60 | 0.22/0.81 | -0.42/1.0 |
| Fatigue | -0.20/0.74 | -1.20/0.21 | -0.50/1.0 |
| Depression | 0.70/0.82 | -4.50/0.54 | -2.30/0.45 |
| Vigor | -0.12/1.0 | 0.50/0.93 | -2.71/0.56 |
| Confusion | 0.44/0.67 | -2.10/0.26 | -1.33/0.62 |

DISCUSSION

This review analyzed two RCTs, and one clinical trial for the utilization of animal assisted therapy with dogs to help improve psychosocial variables of mood in patients being treated at a hospital facility. All three studies successfully showed improvement in factors of mood in some aspect. The randomized control trial by Cole and the clinical trial by Coakley showed significant improvement in mood outcome when comparing the intervention group to the alternative therapies or the control. The randomized control trial by Johnson et al did show an

improvement in mood, however that improvement was not statistically significant and therefore cannot be used to confirm whether or not AAT is helpful in hospital patients. Since the idea of Animal Assisted Therapy is still fairly new, the two studies were positive and indicate that there are benefits of AAT with dogs in a hospital setting.⁵ As mentioned earlier psychosocial variables of mood refer to anxiety, depression, anger, and so forth in regards to that particular individual's current biological and social factors such as setting or possibly some internal struggle. In order to positively affect the variables of mood for hospital patients often their social setting and how they cope with their current situation needs to be addressed. These studies show that Animal Assisted Therapy can utilize dogs as facilitators of that social support. A patient's perception of social support while receiving treatment may be placed on what interpersonal relationships they have at that time which may in turn affect their outlook on their current health state and may effect them getting better. When hospital utilize dogs in AAT they are putting in place a form of social support that could provide protection from anxiety, depression, and other related illnesses. This belief has been supported by research associated to morbidity and mortality of coronary artery disease, recovery of surgical procedures, and psychological well being under stress.¹⁰ The emotional support in initial stages of a severe stressor, like loss of functionality, or a cancer diagnosis is also shown to be of importance for successfully coping with such stressors.¹⁰

Although these studies did show positive results there were some limitations that may have played a role as to why only 2 out of the 3 showed statistically significant data. For Johnson et al, which worked with oncology patients, it was never addressed whether or not the patients' cancer worsened and the accompanying symptoms affected responses. Since there were no before and after parameters established to measure whether or not the patient had deteriorated in their health during the study, certain aspects that are factors of mood could have been fluctuating

throughout the study regardless of intervention.⁷ Since the study did show positive results in mood variables, the study might have achieved statistically significant data with a larger sample size. In addition future studies with oncology patients should set out to control stage and type of cancer along with differing treatment regimens that come with staging. In the clinical trial by Coakley et al, there were important limitations such as a lack of control group, the small number of subjects, and the short time frame over which the study was done and possibly the amount of time in each AAT session.⁵ Lastly, Cole et al showed significant data, but possibly could have been more pronounced if the data collection hadn't occurred during such a short time frame-12 minutes with the dog.

CONCLUSION

It is concluded that Animal Assisted Therapy with dogs is an effective intervention in treating the psychosocial variables of mood of patients being treated in a hospital setting for illness. Two of the three studies showed significant improvement in variables of mood that the patients were experiencing such as depression, anxiety, fear, anger etc. The third study did show positive improvements however they were not statistically significant possibly due to limitations when addressing the patients' health issues for which they were currently being treated.

The significant improvements in various psychosocial factors of mood with AAT may provide patients with a meaningful relationship while trying to get better. Rather than have the patient deal with this situation alone; the relationship they establish with a dog through AAT allows them to channel possible anxious, depressed, or frustrated feelings that may arise. As these dogs provide the necessary social support for these patients, they can provide a sense of comfort and safety while getting better, and it diverts attention away from some of the more complex things they are trying to process at the moment.

AAT is still relatively new so it is important that additional studies be done focusing on the relationship between factors of mood, and the immediate as well as long term benefits of having received AAT while being treated for a health concern. Since the studies have subjective outcomes it would be best if they utilized similar tools for collecting data from patients such as Profile of Mood Survey (POMS) or Spielberger State-Trait Anxiety Inventory forms as opposed to developing questionnaires unique to the hospital in order to ensure that these subjective measures of anxiety, depression, and so forth are being measured are more established.

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