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Effects of Animal Assisted Therapy on Human Health

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EFFECTS OF ANIMAL ASSISTED THERAPY ON HUMAN HEALTH

by

GENE SWANSON

A thesis submitted in partial fulfillment of the requirements
For the Honors in the Major Program in Nursing
in the College of Nursing
and in the Burnett Honors College
at the University of Central Florida
Orlando Florida

Summer Term 2014

Thesis Chair: Dr. Angeline Bushy

ABSTRACT

The purpose of this thesis is to conduct an integrative review of existing literature focusing on Animal Assisted Therapy (AAT), specifically canines, on human health. The reviewed articles were published between the years of 2000 to 2014, written in the English language, scholarly in nature, in peer-reviewed journals with access to full text electronic versions of the article, along with articles that provided current anecdotal information related to the effects of AAT. Search terms included the phrase, “animal assisted therapy” in the title. Results of the literature search yielded an enormous quantity of recent and innovative research on various aspects of AAT. Various animals were identified with ATT, most often canines; however, it is not uncommon to find that horses, dolphins, felines, birds, or even small mammals satisfying the same roles. Of these, for this thesis thirteen research articles were selected that dealt primarily with canines in AAT. The findings from the review for this thesis suggested that despite the large volume of available research on ATT in general, a gap in literature exists focusing on the health outcomes with specific animal species. Additionally, the research was noted to be fragmented in nature and the findings were inconsistent; thus, limiting the development of evidence based ATT interventions. Implications for nursing research, policy, education and practice are discussed, along with limitations of this integrative review.

DEDICATON

I would like to dedicate this thesis to all of the supportive people in my life who helped me to achieve this goal. This is dedicated to my lovely wife Denise who provided the encouragement and support that I needed to complete this project. I would also like to thank my children Sydney and Kevin for the patience that they displayed while I was occupied with this mission.

ACKNOWLEDGEMENTS

I would like to thank the faculty and staff who supported and encouraged me in this HIM endeavor. I want to thank Dr .Leslee Damato- Kubiet for getting me involved in the HIM program and for coaching me throughout the process. Thank you, Dr.Angeline Bushy for all of your ideas, guidance, and also for serving as my thesis chair. I would like to extend my gratitude to Ms. Sarah Landreville and Dr. .H. Edward Fouty for your suggestions, feedback, and for serving on my thesis committee as well. Thank you, Ms. Maureen Oliveri for reminding me of important deadlines and notifications. All of you have been a tremendous asset and I could not have accomplished this task without you.

TABLE OF CONTENTS

INTRODUCTION	1
LITERATURE REVIEW & DISCUSSION.....	3
<i>Background</i>	3
<i>AAT in Heart Failure</i>	9
<i>AAT in Ambulation of Heart Failure Patients</i>	12
<i>AAT in Pain Management</i>	15
<i>AAT for Pediatric Pain Relief</i>	18
<i>AAT and Health Promotion Benefits</i>	20
<i>AAT in Treatment of Cancer Patients</i>	23
<i>AAT in Treatment of Aphasia</i>	25
NURSING IMPLICATIONS & STUDY LIMITATIONS	28
<i>Research</i>	28
<i>Policy</i>	29
<i>Education</i>	29
<i>Practice</i>	30
<i>Primary prevention</i>	31
<i>Secondary prevention</i>	32
<i>Tertiary prevention</i>	32
<i>Limitations</i>	33
APPENDIX A Figures.....	34
APPENDIX B Tables	36
REFERENCES	44

INTRODUCTION

The purpose of this thesis is to provide a comprehensive literature review of research findings concerning Animal Assisted Therapy (AAT) specifically canines and their influences on the mental and physical health of humans. The findings of this thesis will identify existing evidence as well as gaps in the research, in addition to studies that beckon a closer examination of the human-animal therapeutic relationship. This thesis will also draw attention to the areas of AAT that are not fully understood or require further clarification along with well individuals and human conditions that can benefit from AAT.

This thesis will be substantiated by utilizing a synthesis of current AAT research that documents the influence that animals have on health outcomes in people with mental or physical issues. A search of the available literary research will be achieved via databases which include EBSCO Host, PubMed, CINAHL plus with full text, PsycINFO, and Medline. Criteria for inclusion in the search of AAT focuses on research that attempts to examine the therapeutic relationship that exists between human beings and animals. Synthesis of articles for this research included full text articles that were peer reviewed, had full text available online, were in English, and were published between the years of 2000-2014. Subjects will not be excluded based on age, illness, sex, race, religion, context (setting), or any other factor. In the initial search, all animal species were considered for inclusion in this thesis

Initially, the search began with the phrase "animal assisted therapy" in documents which were published anywhere between 1971 and 2014. The search yielded 7283 results. Results were then limited to 5487 by searching for publishings that included only those which had the full text available online. The field was further narrowed to 2986 results by then selecting

scholarly journals/peer-reviewed documents. Documents that were published between 2000 and 2014 were then added to the search criteria which reduce the results to 2692. The search criteria were limited to only those articles which were printed in English and netted 2597 results. The additional restrictive search criteria of including only documents that contained the key phrase within the title resulted in 462 findings. Of these, thirteen were selected for this synthesis.

LITERATURE REVIEW & DISCUSSION

Background

Animal Assisted Therapy (AAT) may have a positive healing effect on individuals who experience a wide array of physical and mental health conditions. Reported benefits include reduced blood pressure, decreased anxiety, and increased feelings of well-being, resulting in improved health outcomes. The moderate correlation between animal and human relationships should come as no surprise to health care providers. Historically, nurses made these observations long ago. Florence Nightingale, who is widely accepted as the mother of nursing, commented on the healing qualities that small animals can have on sick people. Florence Nightingale commented on the benefits of pets for the ill in *Notes on Nursing* by explaining, “A pet bird in a cage is sometimes the only pleasure of an invalid confined for years to the same room” (Hooker, Freeman, & Stewart, 2002, p.18).

Before proceeding, a precise definition of AAT is warranted. Based on information included in the 2011 U.S. Americans with Disabilities Act (ADA) of 1990, the definition given to service animals was updated to read, “Dogs that are individually trained to do work or perform tasks for people with disabilities, including a physical, sensory, psychiatric, intellectual, or other mental disabilities” (Parenti, Foreman, Meade, Wirth, & Oliver, 2013, p.747). This is more of a legal definition that is applied to service dogs in the United States. Unfortunately, if AAT is limited to a very a narrow scope of understanding then a wide array of opportunities to assist people with their difficulties will be lost. It is important to note that not all animals that are employed in therapy are afforded the same liberties as traditional therapy animals thus, are often

excluded from public access protections established by the ADA (Parenti et al., 2013). This thesis will focus on therapy animals which are often specially trained, but also include animals that are utilized by healthcare professionals to assist with improving patient or client or resident outcomes. Additionally, for sake of clarification in this paper, the term ‘patient’ refers to individuals admitted into a hospital setting while the term ‘client’ refers to individuals obtaining services in a community based setting. The term ‘resident’ refers to individuals residing in an institution such as a an assisted or long term care facility.

It would be a great disservice to humans, animals, and their trainers alike, to view AAT in the context of being limited to dogs that are exclusively trained to do only physical tasks for disabled persons. AAT has a capacious reach that far exceeds the physical component of animal and human interaction. This becomes more apparent when the connection between AAT in regard to mental health, motivation, companionship, confidence, and stress reduction is examined. It should also be noted that another difficulty associated with describing AAT is that it is known by a myriad of titles which include among others canine assisted therapy, canine assisted ambulation, riding therapy, equine therapy, assistance dogs, dolphin-assisted therapy, animal-assisted activity, and service dogs among others. The variety of animals involved in this type of therapy might come as a surprise to most individuals; however numerous authors have documented the evolving research on AAT. For example, it might seem quite unconventional, but dolphin-assisted therapy (DAT) is being used in the Ukraine as part of a complimentary therapy to improve behaviors in children that have special needs such as developmental, emotional, cognitive, or physical disorders (Dilts, Trompisch, & Bergquist, 2011). An additional avant-garde example of AAT involved utilizing horses during a case study in which

riding therapy (RT) was used among females with mental health issues in an effort to increase confidence, self-worth, and social stimulation (Burgon, 2003). The relatively new concept of dog ownership by adult women in China was examined to determine whether dog owners experienced better health related outcomes as measured by sleep quality, exercise, doctor visits, fitness, and sick day usage (Headey, Na, & Zheng, 2008). The findings of recent research help establish the expansiveness of AAT in terms of both the diversity of animals utilized and the wide range of duties that the animals accomplish as discussed in subsequent paragraphs.

The reviewed literature implied a resounding problem with AAT as the majority of studies indicate that additional research is needed in the application of AAT as it relates to diseases (Abate, Zucconi, & Boxer, 2011). After carefully scrutinizing their reports, authors often referenced a lack of understanding when they concluded that further research is warranted in the field of AAT (Headey, et al., 2008). In a recent oncology study the authors concluded that their findings on the effect of AAT in cancer patients needed to be replicated in a larger sample to fully comprehend the role that animals play when the individual is subjected to radiation treatment (Johnson, Meadows, Haubner, & Selvedge, 2008). The wide range of studies on AAT have different foci that vary from sleep patterns and doctor visits in younger Chinese females to the more serious problem of chronic heart failure older adults. Additionally, the AAT research occurs in a multitude of settings and nations. In spite of all the differences among the studies, they share a common concern, that is, a deficit of knowledge relating to why AAT is an effective patient treatment.

Much of the available evidence suggests that researchers are examining dissimilar aspects of AAT rather than thoroughly investigating a single factor associated with the field of study. Hence, as a whole, the existing AAT research tends to be disjointed and unfocused. Unfortunately, the end result is the existence of gaps of understanding thereby making it a challenge to draw meaningful conclusions. Although it has been well over a hundred years since Florence Nightingale took notice of the effect birds can have on humans, the reasons why continue to be a mystery.

Animal assisted therapy has been used to assist humans with various life skills and tasks since early times; although it may have been known by different names. A historical review of AAT was offered by the authors of a 2002 article titled *Pet Therapy: A Historical Review* (Parenti, Foreman, Jean Meade, & Wirth, 2013). The writers explained that in 1792 the York Retreat was created in England as a response to the disturbing treatment and death of a female member of the Society of Friends while she was a patient in an asylum for the insane. The York Retreat incorporated the use of both birds and rabbits in their treatment plans. In a historical context, the authors reiterated Florence Nightingale's belief in the therapeutic benefits that animals can elicit upon their human counterparts.

A century later, pet therapy first surfaced in United States of America (US) in 1919 at the urging of Secretary of the Interior Franklin K. Lane. Secretary Lane advocated utilizing canines in the treatment of psychiatric patients at St. Elizabeth's Hospital in Washington, DC. As a result, in 1942 a pet therapy study was conducted at the Pawling Army/Air Force Convalescent Hospital at Pawling, New York as part of a treatment program for recovering veterans. Results of the study were inconclusive and the potential for further research about pet therapy was

abandoned. Similar obstacles to pet therapy research occurred during the era spanning the 18th century through the early 20th century. Pet therapy, or as it was later known as AAT, was being conducted sporadically, but supporting data was not being collected or otherwise scientifically scrutinized (Parenti et al., 2013).

A major theme in most of the text concerned AAT research that has occurred during the last 50 years. According to the authors, the bulk of pertinent research has occurred during the period beginning in 1961 at which time Dr. Boris Levinson began documenting his observations in the therapeutic animal arena. Dr. Levinson believed that animals were transitional objects that patients could bond with and in time the bonding could be further expanded to include a human therapist. He made the point that animals could be used to establish trust, decrease defenses, and ultimately introduce psychological therapy to children. His discoveries began to give credibility to the idea that therapeutic AAT could be integrated into healthcare. The studies he initiated were later adapted for the benefit of adolescents at the Ohio State University Psychiatric Hospital in the early part of the 1970s. Sam and Elizabeth Corson were credited with transitioning Dr. Levinson's work to teenagers and in 1975 this psychiatrist team shifted ATT into the nursing home setting. The Corson's observed that patients who were participating in AAT experienced enhanced psychological, physical, and social status. Their research is among the first known studies to include the use of animals in a hospital setting while accumulating quantitative data from original research (Parenti et al., 2013).

The 1980s were characterized by an increasing amount of literature pertaining to AAT. Numerous articles and research were published during this decade. Articles during this timeframe sometimes included instruction on starting AAT, choosing appropriate animals,

safety, as well as obtaining administrative support. The positive effects on patient outcomes that AAT offered were often highlighted in many of the studies that included vivid narratives. The studies that emerged during this time period promoted the belief that long-term care patients could satisfy their yearning to be needed by tending to the needs of animals was born. The impact of AAT in acute care nursing was beginning to be valued for its ability to reduce stress levels of staff, patients, and the families of patients. In addition to this occurrence scientific nursing research was initiated as researchers were now beginning to study the effects of AAT on blood pressure. One of the most often documented studies of that time indicated that the one-year survival rate of patients who experienced a myocardial infarction or angina was greater than the survival rate of patients who do not have pets. The research conducted throughout this decade helped lay the groundwork for AAT in the 1990s (Parenti et al., 2013).

The 1990s drew on much of what was learned about AAT in the 10 years preceding it. Research was expanded to include home healthcare as a setting for AAT. Studies sought to examine the effect that AAT invokes on both previous pet owners and children. One experiment utilized AAT as a pleasant distraction device for both children and their parents during painful procedures. In another study researchers observed that hospice patients were less withdrawn from loved ones and staff when AAT dogs were incorporated into the visit. One study found that Alzheimer's patients had increased social activity when a canine was present. AAT research was developing in terms of both psychiatric and physical aspects (Parenti et al., 2013).

The authors offered a historical review of AAT within the document. It is essential that previous AAT studies be assessed to guide future research to occur. As a whole this work provided a plethora of AAT examples throughout the ages. The numerous examples gave a well-

rounded overview of AAT history with the citing of both psychological and physical experiments. The primary weakness of this article appears to be the lack of negative outcomes that were mentioned in the text. That is to say that the information discussed was nearly all positive. The authors did make a brief mention of the potential for zoonosis or the spread of animal disease to human beings, although the article did advise that such instances could be avoided through strict adherence to safe hygiene guidelines (Parenti et al., 2013).

AAT in Heart Failure

A recent study attempted to determine if AAT could decrease the indicators of physiological and psychological stress in individuals with advanced heart failure. The researchers chose to use a three group randomized repeated-measures experiment design during which data was gathered at baseline just prior to variable exposure, again in 8 minutes after the administration of the intervention, and lastly at 16 minutes after the first measure. The subject groups were randomly divided into a control group which received usual care, an experimental group which received a 12 minute visit from a dog/dog handler, and another experimental group received a 12 minute visit from a human volunteer. The researchers measured several different variables which included blood pressure, heart rate, pulmonary capillary wedge pressure (PCWP) , pulmonary artery pressure (PAP), right atrial pressure (RAP), cardiac index, systemic vascular resistance (SVR), epinephrine level, nor- epinephrine level, and anxiety. In order to be included in the study participants had to have a diagnosis of advanced heart failure to the degree that they required the use of an indwelling pulmonary artery catheter and had to have the ability to read, write, and speak English. In addition to these requirements patients had to have a stable

mental status and an elevated SVR level within the previous 12 hours preceding the experiment. Patients were excluded if they had an allergy to dogs, immunosuppression, an infection that elevated white blood count, a fever greater than 38°C, and if they had a reduced level of consciousness (N=76) (Cole, Gawlinski, Steers, &Kotlerman, 2007).

The researchers went on to explain the procedures that were used to gather data for the experiment. The text continued to describe that cardiac index is essentially a measure blood flow while SVR indicates the amount of vascular constriction. Epinephrine and norepinephrine (catecholamines) levels were measured from samples which were obtained via the proximal port of the patient's pulmonary artery catheter after patients had been in a supine position with the head of the bed elevated to 45° for 15 minutes prior to the first blood sample being withdrawn. An increase in catecholamine levels is associated with the cascade of biochemical events that occur in response to advanced heart failure. Anxiety levels were measured with a self-report questionnaire known as the Spielberger Trait-Anxiety Inventory. The data was analyzed by SAS statistical software and each model was adjusted for the baseline measure of its dependent variable, age, sex, New York Heart Association classification, ejection fraction, history of dog ownership, in addition to the smoking status and history of the both patient and their partner (Cole, et al., 2007).

Of the 76 patients, 26 were randomly placed into the volunteer/dog group, 25 were randomly assigned to the volunteer only group, and 25 were randomly selected for the control group. The results of this experiment indicated that the volunteer/dog group had significantly greater decreases in systolic PAP and the PCWP both during and after the intervention visit when compared to the control group. The findings also suggested that the volunteer/dog group

had significantly greater decreases in epinephrine and non-epinephrine levels during and after the visit. The volunteer/dog group had the greatest reduction of anxiety from baseline when compared to the other two groups. The authors advised they did not see a decrease in blood pressure as they had previously suspected (Cole, et al., 2007).

The researchers believe that the reduction in neurohormone levels possibly was due to the pleasant distraction that AAT provided from the medical staff and hospital environment setting. It is believed that the reduction in anxiety can be attributed to the social support and the mental buffering that AAT may provide. The authors explained that the minimal change observed in cardiac index and SVR could have been due to the brief exposure to the intervention. The effect of a longer intervention exposure on hemodynamic values is not known according to the researchers. Neither prescribed pharmacological interventions nor IV therapies were discontinued during the experiment and as a result those measures may have influenced the findings (Cole, et al., 2007).

This study did appear to have numerous strengths including the utilization of randomization. Measurements were taken from a variety of sources that included both physical and mental dimensions. The literature included several tables that divided the data into orderly and discernible columns. The approval of the institutional view board (IRB) was ascertained prior to the start of the experiment and participants along with volunteers completed informed consent documents. One of the weaknesses in the study was the relatively small sample size. The authors acknowledged that this research project was funded with a grant from the Pet Care Trust Foundation. The experimenters concluded that a larger study is necessary to adequately understand the effect of AAT in patients for both the short-term and long-term timeframe.

Additional research is needed to determine the effect of AAT on managing the patient's symptoms, improving the patient's satisfaction, and decreasing the patient's length of stay in hospital. Further examination into the influence that AAT has on morbidity, mortality, depression, quality of life, functional status, and social support in patients with advanced heart failure is necessary (Cole, et al., 2007).

AAT in Ambulation of Heart Failure Patients

Heart failure was investigated from a slightly different perspective in a 2011 study titled, *Impact of Canine Assisted Ambulation (CAA) on Hospitalized Chronic Heart Failure Patients Ambulation Outcomes and Satisfaction: A Pilot Study* (Abate, Zucconi, & Boxer, 2011). It should be noted that CAA is a form of AAT that exclusively utilizes canines and will be referred to as AAT for the majority of this text. The authors were interested in examining the effect that AAT had on influencing ambulation in patients who had a primary diagnosis of heart failure. According to the authors both frequent and early ambulation in patients who are hospitalized is a key intervention that has consistently demonstrated beneficial outcomes on the patient's functional status in addition to decreasing their length of stay in the hospital. The authors indicated that only a small proportion of heart failure patients ambulated to a satisfactory level during their hospital stay. Missed opportunities for early ambulation were considered to be a contributing factor to increased number of complications along with the overall cost of treatment. Hence, the researchers sought to discover pioneering AAT approaches to inspire and support ambulation for heart failure patients (Abate et al., 2011).

Abate, Zucconi, and Boxer (2011) concluded that during a review of literature the majority of existing research on AAT was in the format of subjective case studies. Driven by gaps in literature, the goal of the study was to essentially answer three questions. Researchers were interested to know if the introduction of AAT would; decrease the number of patients who refused ambulation without the aid of a canine; would the canine encourage patients to walk more steps during their ambulation; and would patients be satisfied with the addition of a canine in their rehabilitation. The research is described as a prospective study which utilized historical comparison in addition to random selection of subjects for data analysis. According to the authors, the number of randomly selected patients with a diagnosis of heart failure that was used for historical comparison was 537 and the refusal rate for that population was 28.1%. The actual sample size used for the study was 69 patients (Abate et al., 2011).

Approval from an IRB was granted for the study, conducted in an acute care facility in rural New Jersey over the course of 10 months. Patients who participated in the study ranged in age from 39 to 95 years old (mean age was 69.5 years old). The methods consisted of a specially trained restorative aide (RA) who established contact with patients and ascertained their willingness to ambulate. If the request was met with refusal the RA exited the patient's room and returned a short time later while the lead examiner and the AAT canine waited just outside of the patient's sight. The RA then inquired about the patient's feelings about dogs and their allergy status during exposures to the animals. Based on a patient's responses to these questions he/she was again provided an opportunity to ambulate with AAT canine. If the patients chose to walk then the number of steps was measured with a pedometer and upon completion the patient was then given the opportunity to visit with the canine in their room. The examiner then met with the

patient to give an overview of the study and to obtain consent for inclusion in the experiment. The participating patients were asked to complete a Likert five question patient satisfaction survey. Patients who initially chose to ambulate were also given the option to ambulate with the canine (Abate et al., 2011).

Results of this research indicate that of the 69 patients, 51 were willing to ambulate when first asked by the RA while 13 others decided to walk only after the canine was offered. There were 5 patients who refused to both walk and were unwilling to participate in AAT. When the refusal rate was compared to the historical rate of 28.1% it indicated that 7.2% refused to participate with the AAT dog. The authors calculated that patients who participated in AAT had a 96% increase in ambulation distance when compared to the historical group. All of the patients who participated in AAT were satisfied with their outcomes and would take part in the program again based on results of the patient satisfaction data (Abate et al., 2011).

The first strength in research is the fact that the authors obtained consent from an IRB prior to moving forward. The consent of the participants was also acquired before their data was included in the study. Measurements that included objective and subjective data were monitored during the experiment. Numerous tables, graphs, and figures were incorporated into the article. No conflicts of interest were noted in the literature. It should also be restated that this is a pilot study. Weaknesses include the utilization of a small sample size. The researchers were unable to control patient comorbidities in addition to the length of their hospital stay (Abate et al., 2011).

AAT in Pain Management

In a 2011 study researchers investigated the effects that a brief therapy dog visit can elicit on pain management patients, the patient's families, and the pain management facility staff (Marcus et al., 2012). The study is described as open label and occurred in a university tertiary adult outpatient care facility over the course of two months. IRB approval was granted prior to the start of the research, specifying that the researchers did not have to attain informed consent from the study subjects. The reasons cited for the exemption were time constraints and the likelihood that participants might report more positive results if they were more aware of the research parameters (Marcus et al., 2012).

Study participants were enrolled via advertisements that were placed in the patient waiting room areas as well as on the door of the room that contained the therapy dog. The sign announced the existence of a therapy dog research project and inquired about how patients felt about spending waiting room time with a therapy canine. Directions on the sign requested that those interested in the intervention complete the first page of a survey prior to meeting with the dog. For this study a single certified therapy dog along with a single handler were utilized. The canine was described as a 40 pound Wheaten Terrier that is accredited through Therapy Dogs International. The initial one-page survey requested demographic information as well as the four question Patient Health Questionnaire (PHQ-4), which is described as an brief mood disorder screening tool. Additionally participants were asked to rate their current severity of symptoms by way of an 11 point scale which rated 10 different factors. The measured factors in the study included stress level, pain, fatigue, aggravation, anxiety, irritability, sadness, pleasantness,

calmness, as well as cheerfulness. Regardless of how many daily appointments the participant attended, they were only permitted to complete one survey per day (Marcus et al., 2012).

Participants were able to meet with the dog and its handler in a separate room. The conversations that ensued were guided towards information about the canine while attempts were made to discourage discussion about the patient's health. Researchers noted that the quantity of time that each participant spent with the dog fluctuated as a result of the typical movement of business within a busy healthcare facility. On average the patient spent 11.1 minutes with the intervention, family/friends spent 10.2 minutes, and staff spent 8.2 minutes. Participants were then asked to complete a post survey prior to exiting the room. Research participants from the control/nonintervention group completed a post survey beginning at the 15 minute mark. Results of the surveys were later analyzed and compared for inclusion in the data (Marcus et al., 2012).

According to the authors, clinically meaningful pain relief was reported by 22.6% of the patients visiting with the AAT dog compared to just 3.6% of the control group. Patients who received visits with the therapy dog reported that they were calmer, more pleasant, and more cheerful after the intervention. The patients also indicated that they had less fatigue, less stress, less aggravation, less anxiety, less irritability, and less sadness during the post survey. The researchers included both family and friends in the study, although it was expected that the sample size would be too small to be statistically significant. The reason for the data inclusion was for the benefit of future studies that might occur. Researchers acknowledge that part of the problem with measuring the intervention on family/friends arises from the point that these particular participants are not necessarily going to be present, whereas the patients are required to be at the clinic. Hence, this factor was self-limiting by its mere nature. In regard to the staff,

the examiners stated that the busy activity within the clinic influenced the amount of time that an employee could spend with the canine as their obligation was first to the patient. The pain levels of staff and family/friends were not significantly impacted by the intervention as neither was seeking to remedy a discomfort. Participants who received AAT overwhelmingly stated that they had a positive experience and wanted to enroll in the therapy again. Patients who received the nonintervention reported that their symptoms neither deteriorated nor improved while waiting for their appointment with the clinician (Marcus et al., 2012).

The use of a larger sample size (N=391) than most comparable studies was among the strengths of this research. The article included detailed tables, charts, and graphs that assisted with digesting the data. An IRB did approve this study before it began. An attempt to better understand aspects of AAT were made by the authors as data from staff and family/friends was also compiled. One weakness of the study was the condition that it occurred in were a relatively small geographic area. The researchers relied primarily on subjective data that was collected through self-reported surveys. The study was unable to indicate whether AAT had long-term effects on participant's outcomes. Additional factors such as other complementary therapies or pharmaceutical pain relief were not taken into consideration (Marcus et al., 2012).

The data suggests that the use of AAT as a custom therapy treatment may alleviate pain and improve mood for various patients. The authors believe that future studies should include more than one dog in addition to the use of a variety of dogs that offer differing breeds and sizes (Marcus et al., 2012).

AAT for Pediatric Pain Relief

A group of authors investigated the effects of AAT on pain relief in a 2009 study. Specifically, the authors were interested in the impact that AAT evokes on immunocompetent children between the ages of 3 and 17 years old. The setting of this research was at an acute-care pediatric facility and the study was conducted between 2005 and 2008. A quasi-experimental study design was used to better understand the relationship of AAT and human behavior. Participants were excluded if they were not experiencing pain, if they were in isolation for infectious disease, if they had infectious disease, if they were allergic to dogs, or if they had a fear of dogs. The text indicated that the researchers intended to have a sample size of 94 subjects and ideally it would have 47 who received an intervention as well as another 47 who acted as the control (Braun, Stangler, Narveson, & Pettingell, 2009).

St. Cloud Hospital IRB approved the research before the study began and in addition parental permission was acquired with the implementation of informed consent documents. The authors stated that written consent by the child was attained if the child was seven years of age or older. Pain assessment was measured with a FACES pain scale, which utilizes 6 black and white cartoon faces to represent the child's level of pain. A smiling face was given the numeric value of 0 that represented no pain whereas a crying face was given the numeric value of 5 that represented the worst pain. Both the child and the parent were asked to point or tell which face best represented the pain levels currently being experienced. The children's responses to the requests were unknown to the parents when the parents selected representative face. Objective data in the form of blood pressure and pulse rate were gathered with the aid of a calibrated GE

Dynamap Procare while the respiration rate was measured for 1 minute by a trained observer (Braun et al, 2009).

An intervention group with a sample size of 18 participants met with an AAT dog and handler for 15 to 20 min. The final decision to complete the intervention session with the participant was made by the dog's handler. The authors explained that this was based primarily on the dog handler's interpretation of the AAT dog's body language. The handler was instructed to sit silently in the room while avoiding the use of instruction to the participant. A posttest which measured the same values was administered after the intervention left the room. In comparison the control group consisted of 39 children and their parents, who instead sat quietly for 15 minutes in a calm environment. The same values and physiologic measures used with the intervention group were also used to measure the same parameters on the control group in both a pretest and posttest (Braun et al, 2009).

The authors indicated that their research suggests that the pain reduction was four times greater with children undergoing AAT when compared to the control group. The level of pain reduction that was achieved within 15 minutes which was comparable to the pain relief that can be achieved by an adult with the use of an oral acetaminophen according to the researchers. Data indicated that a slight increase in the respiratory rate was noted. The described increase of 2 breaths per minute is believed to be the result of a response to the excitement of a dog visit in a hospital environment. The intervention did not have a significant impact on blood pressure or pulse according to the text (Braun et al, 2009).

The researchers indicated during the study with more than 500 children and their parents were interviewed for inclusion in the study, but the majority of them were eliminated due to the

children being absent of pain. The authors pointed out that the reason that the intended sample size was not realized was due to the death of the AAT dog, a Springer Spaniel, prior to the study being completed. In this study a single AAT dog was employed and the authors opted to use the data that had been gathered up to that point rather than change a variable such as the canine. The dog expired of natural causes, at home in the presence of its handler and none of the participants in the study were personally affected by its demise (Braun et al, 2009).

This study did have several notable strengths. First of all, the research included both subjective and objective data. In theory, data-gathering of this nature may yield a more well-rounded understanding of AAT. The authors tailored their data collecting techniques by adapting pain scales to a FACES format which allowed it to be more understandable to the participants. In order to collect objective data such as vital signs, calibrated Dynamap instruments were utilized. The experiments were approved by an IRB prior to being initialized and in addition both informed consent from parents and consent from children who were 7 years of age or older was acquired. One of the weaknesses of the study was found in the point that it was not fully randomized. The sample size was inadvertently made rather small due to the utilization of only one dog and the untimely departure of that animal. The results of this study could have been influenced by the lack of control on the administration of pain medications prior to the interventions (Braun et al, 2009).

AAT and Health Promotion Benefits

In a recent large study, researchers examined the health promoting effect that pet dogs have on their owners health (Headey, Na, & Zheng, 2008). This study utilized the largest sample

size that was encountered during the review of the literature. The authors described the research as a natural experiment and offered reasons for the classification. The authors indicated in China pet ownership was essentially banned in big cities prior to 1992. Since that time pet ownership has risen to include nearly 10% of the population. The authors believe the Chinese population would make an excellent study group due to the unique situation that created a large volume of new pet owners. Furthermore, the population was more likely to be free of previous pet ownership, family pet ownership, or childhood pet ownership (Headey et al., 2008).

The researchers chose to utilize women aged 25-44 as the sample of choice associated with their previous research which had focused on that demographic group. The sample size was 3031 with 1516 participants owning dogs and 1515 not owning dogs. Data was gathered equally between the Chinese cities of Beijing, Shanghai, and Guangzhou. This research was unique in the fact that it proposed 7 hypotheses. The authors listed the hypotheses in numerical order beginning with (1) dog owners engage in more regular exercise than non-owners, (2) dog owners have better self-reported physical fitness than non-owners, (3) dog owners have better self-reported health than non-owners, (4) dog owners sleep better than non-owners, (5) dog owners take fewer days off sick from work than non-owners, (6) dog owners make fewer doctor visits than non-owners, and (7) dog owners who are closely attached to their pets reported better health related outcomes than owners who are not closely attached (Headey et al., 2008).

An IRB from the Beijing Normal University approved the research that included data collection to be gathered via telephone survey. Survey questions were conceived by the authors and were intentionally written in an attempt to avoid any bias. The authors explained that the

survey was about lifestyle and opened with questions in regard to ownership of products other than pets. The survey then inquired about more specific pet related topics. It is important to note that the participants were selected using random telephone digit dialing (Headey et al., 2008).

The results of this research suggested that dog ownership is positively correlated with participants engaging in more exercise. Additionally, dog owners reported better physical fitness as well as better health than non-owners. Better sleep and fewer days off due to sickness were described by the dog owner population. The dog owner segment stated that they made fewer doctor visits than the non-owners. The authors were able to positively correlate the strength of dog/owner relationship with improved health outcomes. The research was unable to relate the number of sick days to the strength of pet attachment. More specifically, dog owners reportedly engaged in 36% more exercise and experienced poor sleep at a rate of only 54% than that of their pet free counterparts. Dog owners described using less than 50% of the number of sick days and visited the doctor at a rate of less than half of the non-dog owners (Headey et al., 2008).

Strengths of this research include a large sample size (N=3031) as well as the approval of an IRB. The study utilized random selection and examined 7 unique health related hypotheses. Several charts, tables, and figures were included in the text. One weakness of the study was that it focused on only those residing in metropolitan areas. Females of only a certain age group were focused upon and the results may not apply to other demographic populations. Variables such as employment, education, income level, and marital status were unable to be controlled. Explanations of the data manipulation and extrapolation were offered, although the information was difficult to fully understand (Headey et al., 2008).

AAT in Treatment of Cancer Patients

The effect of AAT on mood, self- perceived health, and sense of coherence among patients with cancer was explored in a rather more recent study (Johnson, Meadows, Haubner, & Sevedge, 2008). Although this research article is actually referring to AAT as Animal Assisted Activity or AAA, the two are considered to be synonymous. The researchers explained that patients with cancer often experience moods which are altered by hopelessness, fear, or anxiety and experience depression at quadruple the rate of the general population. In addition, it is not uncommon for these feelings to persist up to six months after the preliminary diagnosis. Self- perceived health was described as the extent to which people believe they are healthy when compared to their past health or to their peers who are experiencing similar health problems. Researchers described a sense of coherence as an inborn quality that enables people to successfully endure stressful life events and stated that it was associated with people placing a positive interpretation on life events (Johnson, Meadows, Haubner, & Sevedge, 2008).

The researchers utilized a pre/post-test design between and within groups. Informed consent was obtained prior to the start of the research. Participants were randomly divided into groups using a computer generated random numbering system. The treatment group received a dog/dog handler visit, another group received a friendly human visit, and a third group was able to participate in the quiet reading. The sample size was 30 with 10 participants in each group. The intervention time occurred at an interval of 15 minutes three times per week for four weeks for each of the groups. The study was conducted at the outpatient radiation therapy areas of 2 American Midwestern hospitals (Johnson, Meadows, Haubner, & Sevedge, 2008).

The pre-test consisted of several questionnaires, the first of which examined demographic factors. Age, marital status, education level, living arrangement, pet ownership, and cancer questions were included in this portion of the questionnaire. Participants were asked to complete a Profile of Mood States (POMS), which utilized a five point Likert type scale in order to assist with assigning a numeric value to described moods. A self-perceived health questionnaire encompassed six multiple-choice items that attempted to assess the present physical and emotional health of the participants when compared to the previous year and also to their peers. Sense of coherence was measured with the aid of an Orientation to Life Questionnaire (OTLQ). The post-test or exit questionnaire was a combination of closed ended and open ended questions which sought to determine the participants level of satisfaction with their intervention sessions (Johnson, Meadows, Haubner, & Sevedge, 2008).

Participants receive their interventions just prior to their radiation treatments. The AAT dogs were described as a female long-haired Daschund and a female Whippet, who were certified by the American Kennel Club as well as the University of Missouri Pet- Assisted Love and Support (PALS) program. During the canine intervention the dog sat on the sofa with the patient who was able to comb, pet, play, and talk with the dog. The friendly human visitor interventions were facilitated by volunteer nursing students, nursing faculty, hospital initiated staff, or community members. Visitors were cautioned against speaking about the participant's health issues and were encouraged to talk about trivial topics that included the weather, books, or current events. The participants who received the reading intervention were able to select material from an assortment of magazines which had been censored for content about health,

fitness, cancer, self-help, counseling, pets, and AAT (Johnson, Meadows, Haubner, & Sevedge, 2008).

The data indicated that there were no statistically significant differences in the areas of mood and sense of cohesiveness. There were no statistically significant differences detected in self-perceived health, but the dog visit group did rate their health as better than their peers. The group also felt that their emotional health had improved during the course of the study. In one of the open-ended questions on the exit test one of the dog intervention participants expressed the idea that a dog visit can be very relaxing if the person enjoys being around dogs (Johnson, Meadows, Haubner, & Sevedge, 2008).

One of the strengths of this research is that no conflicts of interest were noted. The article provided several tables to assist the reader with assessing the data. The first weakness that limited the study was a small sample size. It appears that the experiment was also hampered by the inability to control other variables which included cancer symptoms and radiation side effects. A control group that received no interventions was not utilized and may have had an effect on the results. The authors felt that the experiment could have been improved by measuring neurochemical changes in the patients and by increasing the length of the study beyond four weeks (Johnson, Meadows, Haubner, & Sevedge, 2008).

AAT in Treatment of Aphasia

Another researcher has taken AAT in a relatively new direction as it is the only research of its type that was encountered during the review of literature. In a 2006 pilot study, researchers were interested in exploring the effects and effectiveness of AAT on people who were suffering

from aphasia. Three men who were afflicted with aphasia due to left hemisphere strokes were chosen as the study participants. The participants had varying levels of speech difficulties and individual goals were set for each man. The purpose of the research was to first examine the effects of AAT speech therapy for people with aphasia and then compare the effectiveness of AAT speech therapy with traditional speech therapy for people with aphasia (Macaulay, 2006).

The author was interested in answering the following questions: (1) is AAT speech therapy effective for persons with aphasia, (2) if AAT speech therapy is as effective, is it less, more, or equally as effective as traditional speech therapy, and (3) will people with aphasia report different levels of motivation and attitude during traditional versus AAT speech therapy. The study group was recruited from people who were enrolled in speech language therapy at the Speech and Hearing Center at The University of Alabama in Tuscaloosa. To be considered for the study participants needed to have a diagnosis of nonfluent aphasia with the Western Aphasia Battery (WAB), no allergies to dogs, a like for dogs, and the presence of speech frustration during speech tasks. In addition to these qualifications, the patients were required to possess a high level of auditory comprehension. The researcher utilized a pretest, mid-test, and posttest in order to measure effectiveness. Participants were first subjected to a traditional speech therapy in which individual sessions were attended for 30 minutes per week for 12 weeks. The men were then enrolled in an AAT speech therapy program for the same interval of time and duration of treatment. An informal portion of the measurements consisted of a client satisfaction questionnaire while a formal measurement was obtained using the WAB (Macaulay, 2006).

A certified male Newfoundland dog was employed as the AAT dog of choice. The author actually views the AAT animal's role as co-therapist. The results indicated that all three participants met or exceeded the therapy goals that had been established for them during the AAT sessions and were considered to be successful. The WAP scores did not change significantly, although the men felt that they had progressed more during the AAT treatments. In regard to the second question that the researcher sought to answer, the data revealed that due to the participants meeting or exceeding their goals they were unable to determine the level of effectiveness of AAT speech therapy versus traditional speech therapy. The answer to the third question appears to be yes as all of the participants expressed that they were more motivated to attend the therapy sessions when they knew that the dog would be there. The results revealed that as a whole AAT speech therapy is at least as effective as traditional speech therapy for people with aphasia (Macaulay, 2006).

The fact that this research is a pilot study which ventures into unexamined domains is one of its strengths. The study utilized an IRB to approve the experiment and additionally obtained written consent from the participants. Several tables were included within the text and enhanced understanding of the data. One weakness in this study is that it utilized a small sample size compared to other research studies (Macaulay, 2006).

NURSING IMPLICATIONS & STUDY LIMITATIONS

The findings from this thesis can have important implications for healthcare professionals in general and nurses in particular related to research, policy, education and practice.

Research

While the literature reviews in general indicated varying degrees of success as an integrated treatment option; however, future research should include data that would incorporate the long-term effects of AAT. This literature survey did not evaluate the patient's responses beyond a few minutes after the intervention or control was administered (Marcus et al., 2012). One attribute that this study shares with the majority of other AAT research is that the experiment subjects must first be willing to engage in the therapy. Essentially, this means that people who have a dislike, fear, or allergy to the animal that is employed will be eliminated from the research thereby decreasing sample size.

A review of research literature suggests that gaps exist in the field of AAT focusing on children. Further studies are necessary, but enough evidence may be available for a health care professional to feel comfortable with the thought of recommending AAT to their employing agency's administration for the benefit of their young patients (Braun et al, 2009). The findings suggest that the use of AAT as a custom therapy treatment may alleviate pain and improve mood for various patients. The authors believe that future studies should include more than one dog in addition to the use of a variety of dogs that are of differing breeds and sizes (Marcus et al., 2012). The future of AAT lies partially in the research that is already being conducted. It is important for future research to build off of studies that have been noted, while it is also

imperative for investigators to cooperate with each other in order to focus their collective energies. In addition to expounding on the research articles of the past, it may also be just as important to explore new AAT utilizations.

Policy

According to a very recent article (2014), AAT is beginning to be used for the benefit of the returning disabled American veterans (Boccone, 2014). Service dogs are being employed to ease the physical and emotional wounds that are associated with war. It is believed that the AAT canines have the ability to detect changes in their owner's respirations, odor, and perspiration which in totality can lead to the early detection and intervention of an impending PTSD anxiety attack. During times of anxiety the dogs are trained to nuzzle and comfort their masters in an effort to thwart a crisis situation. The dogs are also intended to increase their owner's sense of well-being, decrease their suicide rate, decreased their hospitalizations, decrease their medication use, and reduce their reliance of human healthcare (Boccone, 2014). This particular use of ATT has particular relevance for 3rd party payers and the Veteran's Administration who work with returning veterans and strategies to reintegrate these individuals into society and the community.

Education

It is essential that the public, health professionals and nurses in particular be informed about AAT and how to appropriately respond to these species since there is increasing public acceptance and encounters with individuals with assistive animals. Some suggest the number of ATT animals will increase significantly associated with the high number of physically and emotionally wounded returning American veterans who are anticipated to utilize the services

(Boccone, 2014). As a result the public should be educated on the benefits, capabilities, and protections that are linked with AAT animals. Not only is it vital for the public to become aware from a safety standpoint, but also from the legal aspects which were afforded in the U.S. Americans with Disabilities Act (ADA) of 1990 (Parenti et al., 2013).

Practice

Nurses in the practice setting need to be educated about strategies to integrate ATT in a patient's family care plan. Health professionals should be receptive to assistive animals when caring for patients, clients or residents and proactively develop a protocol for ATT visits. The protocol should include guiding information that outlines the schedule of visits and geographic restrictions for the animals. A clear system of identifying patients who wish to participate in AAT should be established by the participating facilities (Johnson, Meadows, Haubner, & Sevedge, 2008). Often, AAT is volunteer-based and typically insured through their respective AAT organizations. AAT is adaptable to numerous different populations and is modifiable to occur in a variety of healthcare venues. Other scenarios in which AAT could potentially be encountered include postoperative patients, residents in long-term care facilities, or even outpatient rehabilitation clients in particular children, the elderly and those with emotional/psychiatric conditions. Essentially, AAT could contribute to reduced hospital stays which in turn could lead to decreased health care costs. However, the review of the literature for this thesis acknowledges that further research is needed to support evidence based practice protocols albeit more studies have focuses on canines in ATT (Abate et al., 2011;(Braun et al, 2009).

There may be important implications for healthcare professionals within the research data. It is possible that AAT could empower speech – language pathologists with a new tool to encourage aphasia patients to attend speech therapy treatment. Aphasia patients may be more likely to pay attention and participate in the therapy with the addition of an AAT dog. Participants reported that they got more enjoyment out of the AAT sessions and looked forward to the therapy. Likewise, participants displayed more frequent episodes of spontaneous communication when the dog was present. An increased show of emotion on the part of the men was also noted during the AAT sessions. One can speculate that the presence of the dog creates an atmosphere that is filled with unconditional acceptance and as a result aphasia patients are more likely to feel comfortable communicating (Macaulay, 2006).

Primary prevention

Primary prevention focuses on promoting health and preventing illness. Research on ownership of an animal suggests this type of companionship can promote health and improve health outcomes. Hardy et al (2008) speculated that the results may actually demonstrate a health chain with canine ownership being the first link in that chain. That is to say that dog ownership may lead to more exercise and increased companionship which may lead to improved sleep. The improved sleep may then in turn lead to improved fitness and health. It is important to recall that this research examined dog ownership at the primary prevention level as it utilized a sample size of females that did not acquire a canine for any specific health issue. Additionally, the researchers pointed out that improved health outcomes of individuals will economically

impact the health care system as a whole (Headey et al., 2008). Research is needed on other animal species relative to the health promotion and primary prevention benefits.

Secondary prevention

Secondary prevention focuses on screening and early diagnosis. For example, some animal species – canines in particular with their exceptionally keen sense of smell may be able to identify an abnormal growth or physiological change even before a technology such as an x-ray. Likewise, an animal may be able to sense chemical changes in an individual, such as an impending seizure, change in blood glucose level lab or psychotic reaction. Definitely, this is a rich area for future research. Additionally, making the canine intervention available to the staff members as well as to people that had accompanied the patient to the appointment (Marcus et al., 2012).

Tertiary prevention

Tertiary prevention focuses on the management of chronic health problems to sustain an optimal quality of life. The majority of the reviewed literatures for this thesis focused on tertiary prevention as the studies were specific to each of the patient's conditions. One of the clearest examples of tertiary prevention was demonstrated in the use of AAT canines that actually live with veterans who are suffering from PTSD. In this case the dogs are constant companions that are actively monitoring their owners for subtle biometric changes. Specialized training enables the canines to respond to the differences in their master's vital signs in an attempt to avoid escalation of the disorder (Boccone, 2014).

Limitations

Three limitations are identified for this thesis. First, the review was undertaken by a novice as this was the initial effort an integrative research review. Second, the focus of the literature search and subsequent review was narrow, and limited to canine ATT. Third, the timeframe to undertake and complete this thesis was restricted and further limited the depth of its analysis and synthesis of the literature.

APPENDIX A

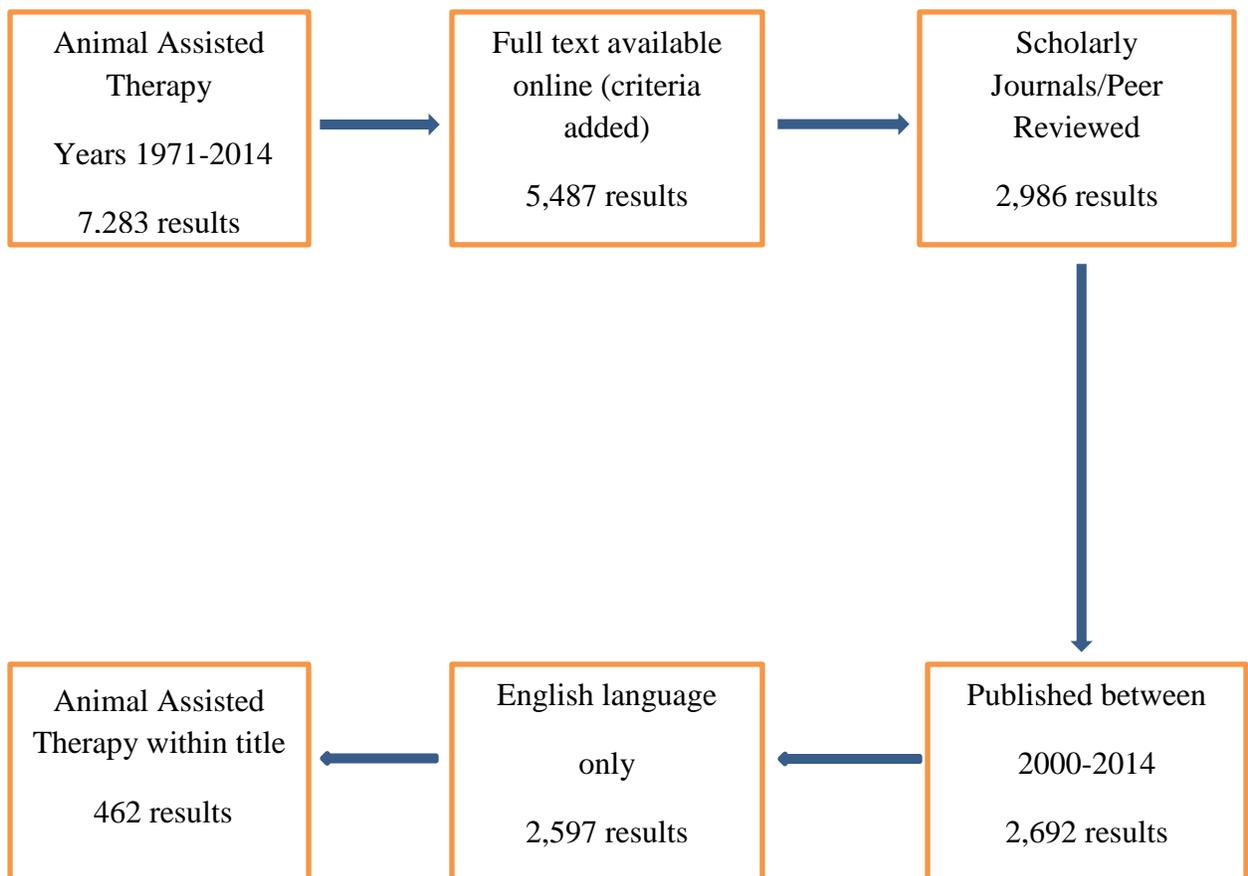
Figures

Figure 1: Consort Diagram

Flow Diagram of Study Selection Process

Key Search Terms = Animal Assisted Therapy

Limiters = Full text available online, Scholarly journals/peer reviewed, Publication Date of 2000 or More Recent, English language, and limited to titles that contained the key search term.



APPENDIX B

Tables

Authors	Article Title	Date & Location	Setting & Method	Sample Size	Strengths & Weakness	Findings
Abate, S.V., Zucconi, M., Boxer, B. A.	Impact of Canine-Assisted Ambulation (CAA) on Hospitalized Chronic Heart Failure Patients' Ambulation Outcomes and Satisfaction: A Pilot Study	May/June 2011, South New Jersey	The study took place in an acute care facility and involved patients that had a primary diagnosis of Heart Failure (HF). Patients were asked if they were ready to ambulate and if they declined they were asked if they wished to walk with a therapy dog. The sample group was then compared to a historical randomly selected sample of the	69 adults (n=69) from an acute care facility that have a primary diagnosis of HF compared to a randomly selected sample of 69 patients from a historical study of 537 patients	Strengths: IRB approved study. No conflicts of interest. This is a pilot study. Weaknesses: Small sample size. Length of hospital stay was uncontrolled. Patient comorbidities could not be controlled.	The study group showed increased rates of early ambulation in these patients. Patients that refused to ambulate initially were given the opportunity to walk with a canine and often ambulated when they were given that chance. Greater distances as measured with a pedometer were recorded in these patients. The survey indicated that the bulk of patients that responded preferred ambulating with the dog.. CAA is offered at a low cost or free.

			same size. A Likert 5 question survey was utilized to assess patient satisfaction			
Braun, C., Stangler, T., Narveson, J., & Pettingell, S.	Animal-Assisted Therapy as a Pain Relief Intervention for Children.	May 15, 2009 St. Joseph, MN	Pediatric acute care unit. 2 groups of Children age 3-17 control group sat quietly for 15 minutes in calm environments change in pain and vital signs with	Total sample size (n=57) Measure change in pain and vital signs with AAT (n=18) or without ATT (n=39) AAT in children ages 3-17.	Strengths: No conflict of interest. Numerous tables were included. Weaknesses: Small sample size. Quasi-experimental Design.	Pain reduction was 4 times greater in the intervention group. Increases of breath rate of 2 breaths per minute were documented in the intervention group.
Cole, K.M., Gawlinski, A., Steers, N., & Kotlerman, J	Animal-Assisted Therapy in Patients Hospitalized with Heart Failure.	November 16, 2007 Los Angeles, CA	A 3 group randomized repeated-measures experimental design was utilized. Longitudinal analysis was	76 (n=76) adults with a diagnosis of heart failure.	Strengths: Randomized. No conflict of interest. Weaknesses: Small sample size. Numerous	The intervention dog therapy group had greater decreases in the sum score of anxiety than both the control group and the volunteer only group. The anxiety score was based on systolic pulmonary artery pressure, pulmonary capillary wedge pressure, epinephrine levels and norepine-phrine levels.

			<p>used to model differences between the 3 groups at 3 times. Control group with usual care vs. experimental group with a 12 minute visit from a dog vs. experimental group with a 12 minute visit from a human volunteer. Data collected at baseline, 8 minutes and at 16 minutes.</p>		<p>tables included.</p>	
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<p>Dilts, R., Trompisch, N., Bergquist, T. M.</p>	<p>Dolphin-Assisted Therapy for Children With Special Needs: A Pilot Study</p>	<p>2011, Ukraine</p>	<p>Quasi-experimental design. Children with special needs such as cerebral palsy, cognitive disabilities, developmental delays, and Down syndrome were exposed to a 2 week program of dolphin swim therapy. Pre and post tests were utilized to measure differences based on the Behavior Dimensions Rating Scale.</p>	<p>37 volunteer children. (n=37)</p>	<p>Strengths: IRB approved. Parent consent given. Tables used to demonstrate data.</p> <p>Weaknesses: Small sample group. Participants had to pay for program.</p>	<p>Dolphin-Assisted Therapy (DAT) increased socialization in children that were reported to be socially withdrawn and reduced fear/anxiety scores. This is a pilot study and the need for further research is indicated..</p>
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<p>Headey, B., Na, F., & Zheng, R.</p>	<p>Pet Dogs Benefit Owners' Health: A "Natural Experiment" in China</p>	<p>2008, China</p>	<p>Quasi-experimental survey of women aged 25-40 in Beijing, Shanghai and Guangzhou, China. Half of the sample owned dogs and half did not. The survey was conducted via telephone.</p>	<p>N=(3031)</p>	<p>Strengths: University approved ethical methods utilized.</p> <p>Large sample size.</p> <p>Weaknesses: Included only females from a certain age group.</p> <p>Focused only on metropolitan residents.</p>	<p>The dog owners reported better health results, citing that they exercised more frequently, slept better, had higher self-reported fitness and health, took fewer days off sick from work, and were seen less by doctors.</p>
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Hooker, S. D. Freeman, L. H. Stewart, P.	Pet therapy research: a historical review	August 24, 2002 Multiple Locations	This is a historical review of AAT with commentary starting in the 1700 century. The review of literature places an emphasis on the evolution of AAT during the last 50 years.	N/A	Strengths: Included numerous examples of a wide variety of AAT. Documented both physical and mental utilization of AAT. Weaknesses: Only include positive outcomes of AAT.	This article gave a varied overview of AAT progress. Nurses are credited with being the driving force behind bringing AAT in patient care settings.
Johnson, R. A., Meadows, R. L., Haubner, J. S., & Sevedge, K.	Animal-assisted activity among patients with cancer: Effects on mood, fatigue, self-perceived, and sense of coherence.	2008, Radiation oncology units of two hospitals in a mid-sized, Midwestern city.	Pretest/post test between and within groups. Pretest/post test between and within groups.	N=30	Strengths: No conflicts of interests were noted. Study included numerous tables. Weaknesses: Relatively small sample size.	No statistically significant differences were noted; however compared with other similar patients (age), those receiving dog visits viewed their health as improved over the 4 week period. Some patients felt that the therapy was beneficial although the improvements were not detectable to the researchers.

Macauley, B. L.	Animal-assisted therapy for persons with aphasia: A pilot study	(2006) Alabama	This study included older men with aphasia from left-hemisphere. The men received 1 semester of traditional therapy followed by 1 semester of AAT. The men completed questionnaires that assessed their experience.	N=3	<p>Strengths: Certified dog was utilized during treatment.</p> <p>Sessions conducted using Western Aphasia Battery (WAB).</p> <p>Weaknesses: Small sample size.</p>	Both therapies were effective, as each participant met his goals. Results of a client-satisfaction questionnaire indicated that each of the men were more motivated, enjoyed the therapy sessions more, and felt that the atmosphere of the sessions was lighter and less stressed during AAT compared with traditional therapy.
Marcus, D. A. Bernstein, C. D. Constantin, J. M. Kunkel, F. A. Breuer, P. Hanlon, R. B.	Animal-Assisted Therapy at an Outpatient Pain Management Clinic	January 1, 2012 Pittsburgh, PA	This study was conducted in a university tertiary care adult chronic pain outpatient clinic. This is an open-label study.	(N=391) 391 therapy dog visits (235 with patients, 34 family/friends, and 26 staff) and 96 waiting room surveys (83 from patients,	<p>Strengths: Larger sample size than most comparable studies. Included detail charts and graphs.</p> <p>Weaknesses: Used a relatively</p>	Therapy dog visits in an outpatient setting can provide significant reduction in pain in addition to emotional distress for chronic pain patients. Therapy dog visits can also improve emotional distress and feelings of well-being in family and friends accompanying patients to appointment.

			<p>Participants were able to spend clinic waiting time with a certified therapy dog instead of waiting in the outpatient waiting area. Self-reported pain, fatigue, and emotional distress were recorded using 11-point numeric rating scales.</p>	<p>6family/friends, and 7 staff)</p>	<p>small geographic area. Relied on self-reported relief from patients.</p>	
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Whittington, A. E.	'Is Karl in?': Paws that Heal	2005 Naval Medical Center San Diego (NMCSO) , CA	Multiple methods used to collect data including observation, health effect, mental health effect, and verbal response. Assortment of U.S. Naval service members. program combining pet therapy, therapeutic recreation, and social reintegration benefits wounded service members--as well as the blind volunteers and their guide dogs.	N/A	Strength: Utilized multiple methods to evaluate. Weakness: Multiple variables such as pet therapy, therapeutic recreation, and social reintegration were manipulated during study.	Numerous positive benefits were observed throughout the study. The positive benefits include a bed bound mute serviceman who began to speak while interacting with a therapy dog.
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