

Review Article

## Benefits of Animal Assisted Therapy in Mental Health

**Konstantinos Koukourikos, MSc, PhD (c)**

Lecturer in Nursing, Nursing Department, International Hellenic University, Thessaloniki, Greece

**Athanasia Georgopoulou, RN**

International Hellenic University, Thessaloniki, Greece

**Lambrini Kourkouta, PhD**

Professor, Nursing Department, International Hellenic University, Thessaloniki, Greece

**Areti Tsaloglidou, MSc, PhD**

Assistant Professor, Nursing Department, International Hellenic University, Thessaloniki, Greece

### Abstract

**Background:** Animal-assisted therapy is defined as the aimed interaction between trained animals and patients, which is considered complementary to conventional therapies. It is designed and implemented by a team of experts including the therapist, the animal handler, and some health professionals.

**Aim:** The aim of this study is to present and highlight the role of animals and their advantages in the treatment of mental illness

**Methodology:** Extensive review of the recent literature was conducted in electronic databases (Pubmed, Google scholar) and scientific journals (Greek and international) using the appropriate key words: animal assisted therapy, mental illness, aging, animal assisted activity, animal companionship, health, pet ownership and a combination of them.

**Results:** Treatment animals are more often dogs, horses, dolphins, birds, and generally animals having gentle nature. The treatment's benefits to the health of mentally ill are related to reducing the expression of the negative symptoms of the disease, developing skills in various areas of patients' personality and moreover improving their quality of life. A prerequisite for the proper implementation of treatment programs is compliance with basic terms and principles for the protection of health, security and well-being of the participants.

**Conclusion:** Prerequisites for the development of this particular therapeutic effort are the definition of treatment parameters, the proper education of health professionals, the coordinated action of a multidisciplinary team trained specifically for its design and implementation and the expansion of the research area.

**Key words :** Animal assisted therapy, mental illness, aging, animal assisted activity, animal companionship, health, pet ownership

### Introduction

From ancient times, human existence is closely related to the presence of animals. The animals followed a parallel course with human either initially as livelihood (food) or later domestication of some of them as a means of livelihood (eg plowing fields) and later as domestic animals for purely personal pleasure and well-being.

The presence of animals relieves, relaxes and discharges people from tension and stress of everyday life. The use of animals for therapeutic purposes, although has a long history, has been expanded just in the 20th century. The interest of

many researchers and health professionals had been developed with regard to the positive consequences of the interaction of animals with humans and its potential health benefits (Hughes et al, 2019).

The studies referring to the above mentioned interaction have been multiplied and the interest has mainly focused on the help that animal contact can provide for the treatment of multiple diseases, particularly those related to mental health. The results of these studies have led to the consolidation of a complementary or alternative form of treatment for various types of mental illness, known as "Animal-Assisted Therapy" (Mandr a et al, 2019).

### **The presence of animals as a treatment**

The use of interaction with animals specially trained for this purpose is applied to improve patient's mental, social, emotional and physical functions. The treatment sessions can take place at various facilities and involve activities such as game, sports and animal care. They are done individually or in groups, and like any other form of treatment, they are tailored to suit each patient's needs (Jackson, 2012).

The animals involved in the treatment are mainly dogs, cats and dolphins. However, if appropriate and possible, farm animals such as horses, rabbits and various birds are also included in the programs. It is well documented in the literature that the presence of animals in treatment can cause feelings of calm and optimism both in adults and children. At the same time, it helps to establish trust between the patient and the therapist, encouraging the achievement of therapeutic goals. Animal-assisted therapy does not constitute an individual psychotherapy school nor is likely to have positive results for all people with all sorts of disorders (Ogilvie, 2016).

### **Wide benefits of animal assisted therapy in mental health**

Animal contact has an important place in the lives of many people, as their presence alone can contribute to their peace and well-being. However, it seems that animals offer much more than just companionship. Their involvement to the treatment of mental illness is a fact for several decades, and the benefits obtained are significant. The multiplicity of terminology existed until a few years ago on the therapeutic use of the animals and its implications, caused confusion to the experts and made it imperative to define fixed concepts, common and widely accepted. Undoubtedly, any patient's approach from an animal to a hospital or clinic is not included in the treatment if certain basic conditions are not met (Kruger and Serpell, 2010). The "Delta Society", one of the largest organizations in the United States, which is responsible for the organization and provision of animal assisted programs, has adopted the following definitions regarding the inclusion of animals in the therapeutic context (Delta Society, 2008) :

#### **A. Animal - Assisted Therapy:**

It is a targeted and structured therapeutic program that involves animals meeting specific

criteria in the therapeutic process as an integral and vital part of it, aiming at improving the cognitive, emotional, social and physical functions of the patient. It is designed and implemented by healthcare specialists who have been further trained for these programs and can take place in a variety of facilities such as hospitals, clinics and other rehabilitation areas, nursing homes, prisons, private homes and animal farms. In this form of treatment, as well as in the rest, the progress of its course and the evaluation of achievement of the initial objectives for each patient, are recorded. It is addressed to individual patients or groups of patients according to the design and objective criteria that have been set. Animal assisted therapy does not depend on any particular psychological theory, but can be incorporated into various types of them (Delta Society, 2008, Friedmann and Son, 2009).

#### **B. Animal-assisted activities:**

These are opportunities for contacting patients with specially trained animals, coordinated by expert professionals or volunteers, in the absence of treatment program and specific treatment goals. Visits of animals to patients' accommodation are spontaneous, without presupposing the recording and evaluation of their progress. In the animal assisted activity context, participants were able to develop interest in themselves, other residents, and their environment, due to feelings of ease and the development of one-on-one relationships with the AAA animals. (Kawamura, Niiyama, Niiyama, 2009, Kruger and Serpell, 2010, Crippa and Feijó, 2014).

#### **C. Animal assisted intervention:**

This concept refers to the broader field of integration of animal assisted therapy into educational programs aimed at training health professionals to organize and implement such treatment programs (Crippa and Feijó, 2014).

Animal assisted programs are being implemented to support children, adolescents, adults and elderly patients suffering from mental disorders. The benefits are achieved through interaction with the trained animals, whether it is related to touching and treating them, or simply by observing the animal and its relationship with its trainer-carer. These potential benefits stem from the fact that contact with animals is a potent supportive source for the patient due to the

acceptance and positive response of the animals to him (Yap, Scheinberg, Williams, 2017, AVMA, 2018).

The benefits of animal assisted therapy extend to various areas of patient personality, namely emotional, cognitive, social, and physical functions (Amerine and Hubbard, 2016):

#### **A. emotional support and stress relief:**

It has been observed that interaction with animals positively affects patients during stressful situations within the therapeutic process. The whole environment of the treatment becomes more friendly and less threatening, and patients seem to feel more calm and relaxed when an animal participates even as a mere presence in treatment sessions. Animals are a tangible source of pleasure and consolation. Experts suggest that when contacted with animals, neurotransmitters such as serotonin and endorphins are released, causing a feeling of happiness and calm while reducing the secretion of stress hormones such as cortisol and adrenaline, a fact that further contributes to lowering blood pressure and heart rate. In addition, patients, as they treat animals, have the potential to develop care and empathic skills. At the same time, the interaction with them has a catalytic effect on the patient's relationship with the therapist, contributing to the acquisition of trust between them. On the one hand, therefore, the normalization of aggravating emotions is achieved and, on the other hand, the element of laughter and joy is introduced into the therapeutic process, the value of which should not be underestimated, as it improves, the emotional status and quality of life of people in general (Bachi and Parish-Plass, 2017, Fine, 2018).

#### **B. learning cognitive self-care skills and improving self-image:**

Patients suffering from mental illness often feel powerless, vulnerable and dependent on other people. With the presence of animals, they become potential caregivers of another entity - the animal - for which they often feel responsible by undertaking activities related to its survival. This contributes to strengthening self-confidence and trust. Moreover, many benefits appear for the elderly patients in whom a progressive decline of cognitive skills is observed, such as those associated with memory, self-care, hygiene and cleanliness. Undertaking practices related to animal care by elderly patients, raises motivation

and stimulates memory, while the discussion on self-care issues takes place with less discomfort during the treatment sessions under the presence of an animal. (Bachi and Parish-Plass, 2017, Bachi, Terkel, Teichman, 2012).

#### **C. cultivating social skills:**

Mental illness largely cuts the patient out of his social environment not only because of his stigma but also because of the reduction of skills necessary for the social interaction of humans and the establishment of normal social relations. Moreover, if the disease leads to the patient entering a clinic, he automatically cuts off his social environment and his quality of life is degraded. The inclusion of animals in the treatment of these patients contributes to the partial extension of a normal lifestyle - animals are an excellent companion for many people - and the cultivation of lost social skills. Even by simple observation of the therapist's relationship with the animal and their interaction, the patient gains information about accepted and non-social behaviors. As a result, patient learns how his actions affect those who receive them and he also practices self-control and self-restraint. Another key point is that animals respond in a direct way to the movements and attitudes of people towards them. This positive or negative response helps the patient to adopt appropriate behaviors (Chitic, Rusu, Szamoskozi, 2012, Bachi and Parish-Plass, 2017).

#### **D. Providing opportunities for activity and training:**

Animal assisted therapy provides incentives and opportunities for participation in physical exercise activities that physically enhance the patient and offer fun and enjoyment at the same time. Walking and jogging, gymnastics and animal play contribute to the production of endorphins and improved mood. They also contribute to the practice of coarse and fine mobility, which is significantly affected in some patients with mental disorders (Velde, Cipriani, Fisher, 2005).

#### **Benefits of incorporating animals into modern methods of treating mental illness for children, adults and elderly patients**

Study results on patients suffering from mental disorders have confirmed that participation in animal assisted treatment programs, coupled with other more traditional therapeutic interventions, results in reducing anxiety and depression

symptoms, reducing behaviors associated the disease and improving their social interactions. Experts argue that each patient has undoubtedly his own independent course with regard to the process of rehabilitation, in which traditional treatments have steadily for years positive results. However, searching for new methods and techniques for those who do not respond to basic intervention patterns or who are positively involved in new forms of treatment becomes vital. It is well documented in the literature that animal assisted therapy is a feasible and dynamic alternative for children, adolescents, adults and elderly patients with various forms of mental disorders (Mangalavite, 2014).

### **Depression**

Studies have shown that interaction with animals causes biochemical changes in the patient's brain and release neurotransmitters that improve mood and cause relaxation and suppression of anxiety. These changes has proved to be effective in reducing symptoms of depression in institutionalized elderly and increasing verbal interaction, act as a facilitator of social interaction and eliciting positive emotional responses (Moretti et al. 2011, Ambrosi et al, 2019). At the same time, other benefits to the patient's body functions such as lowering blood pressure and pulse and increasing activity and mobility are achieved, contributing to better and faster recovery of patient health. Potential psychological benefits are emotional support, reduction in feelings of isolation and loneliness, cultivation of empathic skills, rehabilitation of self-image and self-confidence and improvement of orientation towards reality in general (Souter and Miller, 2007). Dealing with animals may also contribute to the mental deprivation of the illness and its symptoms and improve patient's quality of life. The undertaken activities in connection with the treatment animals urge patient to be active and also to perform regular self-care actions. A tight link between the patient and the animals is often created, and it is a source of support and motivation for commitment to the therapeutic procedure. At the same time, contact with animals improves the social skills of patients with depression, breaking the limits of his potential marginalization and providing opportunities for interaction with other people, which is essential for the course of treatment (Horowitz, 2010, Cheung and Kam, 2017). In conclusion, the treatment of depression with animal assistance may present positive and

encouraging results as data from various surveys and studies show. The need for further study in this field becomes imperative for the general acceptance and establishment of the method.

### **Autism**

Animal assisted therapy could have positive effects on children with autism. Animals have features that are not available to humans, which work positively to the symptoms of autism. Opposite to low sensory response induced by autism, animals provide powerful multi-sensory stimuli - strong and clear repetitive sounds, vibrant visual images, distinct and special smell and pleasant touch. This contributes to the ability of animals to have a particular non-verbal communication with them. The involvement of an animal in autistic children's treatment positively affects their reactions and their behavior in general. The children seem more cheerful and concentrated, while their fixed motifs of kinesiology and their tendency to isolate, as well as other characteristics of autistic behavior are diminished. The release of hormones due to contact with animals also leads to the improvement and increase of social interactions of children, even those who develop intense withdrawal from the environment and the people around them ( Hanson et al, 2007, Foden and Anderson, 2011, Siewertsen, French, Teramoto, 2015, Borgi et al, 2016).

In animal assisted therapy, many different symptoms of autism are set as treatment targets. The most important benefits of the treatment include improving child communication and social skills as well as controlling and limiting stereotypical behaviors. Animals not only are the same efficient companion, but also provide opportunities – motivating them - to further social interaction and communication. At the same time they help the child to work within the social environment and reduce his anxiety. They are also a focal point of concentration for the child when he has to cope with over-stimulating sensory states and stimuli, helping him remain more calm and relaxed (Siewertsen, French, Teramoto, 2015). Furthermore, through the care and treatment of the animal, the child acquires daily self-care skills and promotes self-image and confidence. Dealing with animals can also increase the strength of the child and improve the areas of fine and coarse mobility. Animals are not only an incentive to engage in important activities for children, but also a model for their

own learning. Through the observation of their personal interaction with them, but also of other people with animals, children are taught social behaviors, develop ideas, patterns, internal expectations and standards related to normal behaviors and human relationships (Wang, 2013, Anderson and Meints, 2016).

The therapeutic involvement of dogs, horses and dolphins, animals, has been found to be the most effective in the field of developmental disorders of children and adults. Therapeutic riding also presents - due to horse physiology and kinesiology - additional benefits in terms of improving the motor functions of autistic patients (Bass, Duchowny, Llabre, 2009, Wang, 2013,).

### **Dementia**

Animals, and especially dogs, have been participating for many years in visiting programs in elderly patients with dementia, offering the opportunity to create bonds of affection and fun. However, experts on the disease claim that the benefits for patients can be much more by implementing targeted therapeutic interventions with the assistance of animals. People with dementia may experience various symptoms and behaviors during the course of the disease progression. As the disease progresses, the patient usually cuts off links and contact with the environment and social environment, is isolated and greatly restricts his movement and activities. The presence of a treatment animal has been observed to be the only remaining functional patient communication bridge with the reality around him. Research results show that animal assisted treatment can improve the social and communication behaviors and skills of patients with dementia. Many times patients can communicate more effectively with animals than with people of their environment. This contact with the animals provides the trigger and the motivating power of their disengagement from the margin and loneliness that has been caused by the disease (Baun and McCabe, 2003, Cevizci et al., 2013).

It is shown in the literature that animal assisted treatment can act preventively and therapeutically on the effects of dementia and on the emotional health of patients, significantly reducing its negative symptoms, such as aggression and psychotic behavior, confusion, irritability and depressive tendencies. These are common benchmarks among dementia patients (Nordgren and Engström, 2012, Bono et al,

2015). Contact and interaction with animals may also reduce the symptoms of another common disorder in patients with dementia, known as the "West syndrome", in which patients have intense signs of anxiety, confusion and aggression during the early evening hours. The presence of treatment animal has a complacent action in the mental state of patient, providing security and companionship (Perkins et al, 2009).

AAT had a positive effect in dementia patients for several neuropsychiatric symptoms like delusion, depression, disinhibition, euphoria, and aberrant motor activity. Moreover, the ratings of the various behaviors during each session suggest that the beneficial effects of AAT appear during the first few sessions (Tournier, Vives, Postal, 2017).

In addition, activities with treatment animals, such as grooming, gymnastics, walking and playing, give patients a pleasant incentive to get out of their stillness and improve their physical condition and body functions. This reduces the sense of muscle pain, increases motor skills and muscle strength, limits patients' falls and enhances their nutritional and self-care skills (Richeson, 2003, Moretti et al, 2011).

### **Schizophrenia**

The interaction of schizophrenic patients with treatment animals leads to positive effects on the symptom of anhedonia, a disease-induced symptom associated with a lack of capacity for experiencing pleasure with situations and activities that normally cause it. It has been observed that the implementation of animal treatment programs in patients with schizophrenia living in psychiatric institutions has gained the preference of patients compared to other treatment models, as participation in them showed a decrease in the sense of apathy and the manifestation of adverse symptoms of the disease. In addition, patients' cortisol levels seem to be reduced at the end of the reported programs, indicating the reduction of anxiety and stress in people with schizophrenia (Chu et al, 2009, Rossetti and King, 2010).

The therapeutic use of interaction with animals provides patients with the incentive and opportunity for the general improvement of their quality of life. Research has shown not only the reduction of the negative symptoms of the disease but also the onset of positive behaviors related to everyday activities and care of patients.

Patients showed significant improvements in the Living skills profile (withdrawal, anti-social behavior and compliance) and in quality of life related with social relationships. Through regular contact with animals and the performance of activities such as self-care, patients improve their self-esteem and become more active and responsible in their personal lives (VillaIta-Gil et al, 2009, Davidson, 2014). Another study reporting improvements in emotional symptoms and in various measures of self-view and self-image (Virués-Ortega et al, 2012).

The most important element is that it can produce practical benefits, especially in areas where traditional treatments seem inadequate, such as the symptom of patient anhedonia, which greatly affects the quality of their everyday lives (Davidson, 2014).

### Conclusions

Animal assisted therapy, as a complementary approach to traditional therapies, leads to several important benefits for patients suffering from mental illnesses. Its implementation in patients with diagnoses such as depression, autism, dementia, schizophrenia can achieve changes in their personality, behavior and physical health. These changes mainly affect the social interactions of patients, as well as the cognitive, psychological and emotional field, which seems to improve the abilities and skills that have been limited due to the underlying disease. New skills are also being cultivated. This improves patients' self-image and their overall quality of life. The positive benefits of animal involvement in the treatment process lead to the reduction of the onset of negative symptoms caused by mental disorders and the emergence of positive behaviors, mainly concerning the responsibilities and activities of everyday life on behalf of patients.

However, research into the involvement of animals in the treatment of mental illness needs to be broadened and enriched but also to overcome obvious weaknesses and constraints. In this way its potential strengths can be taken into account and the therapy itself can be established as appropriate and important method of intervention.

### References

Ambrosi, C., Zaiontz, C., Peragine, G., Sarchi, S., Bona, F. (2019). Randomized controlled study on the effectiveness of animal-assisted therapy on

depression, anxiety, and illness perception in institutionalized elderly. *Psychogeriatrics*, 19(1): 55-64.

Amerine, J.L., Hubbard, G.B. (2016). Using Animal-assisted Therapy to Enrich Psychotherapy. *Advances in mind-body medicine*, 30(3):11-1, PMID:27541053

Anderson, S., Meints, K. (2016). Brief Report: The Effects of Equine-Assisted Activities on the Social Functioning in Children and Adolescents with Autism Spectrum Disorder. *J Autism Dev Disord*, 46(10):3344-52.

AVMA (2018). "Animal-assisted interventions: definitions", American Veterinary Medical Association, available at: [www.avma.org/KB/Policies/Pages/Animal-Assisted-Interventions-Definitions.aspx](http://www.avma.org/KB/Policies/Pages/Animal-Assisted-Interventions-Definitions.aspx). Accessed at June 27, 2019.

Bachi, K., Parish-Plass, N. (2017). Animal-assisted psychotherapy: A unique relational therapy for children and adolescents. *Clinical Child Psychology and Psychiatry*, 22(1): 3–8

Bachi K., Terkel J., Teichman M. (2012). Equine-facilitated psychotherapy for at-risk adolescents: the influence on self-image, self-control and trust. *Clin Child Psychol Psychiatry*, 17(2):298-312

Bass, M.M., Duchowny, C.A., Llabre, M.M. (2009). The effect of therapeutic horseback riding on social functioning in children with autism. *Journal of Autism and Developmental Disorders*, 39(9), 1261-1267.

Baun, M.M., McCabe, B.W. (2003). Companion Animals and Persons with Dementia of the Alzheimer's Type. *American Behavioral Scientist*, 47(1): 42–51.

Bono, A.V., Benvenuti, C., Buzzi, M., Ciatti, R., Chiarelli, V., Chiambretto, P., Velená, E. (2015). Effects of animal assisted therapy (AAT) carried out with dogs on the evolution of mild cognitive impairment. *Journal of Gerontology and Geriatrics*, 63(1): 32–36.

Borgi, M., Loliva, D., Cerino, S., Chiarotti, F., Venerosi, A., Braminis, M., et al. (2016). Effectiveness of a standardised equine-assisted therapy program for children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 46 (1): 1–9.

Cevizci, S., Sen, H.M., Güneş, F., Karahmet, E. (2013). Animal Assisted Therapy and Activities in Alzheimer's Disease, *Understanding Alzheimer's Disease*, Inga Zerr, IntechOpen, DOI: 10.5772/54504. Chapter 12 pp. 303-326. Available from:

<https://www.intechopen.com/books/understanding-alzheimer-s-disease/animal-assisted-therapy-and-activities-in-alzheimer-s-disease>. Accessed at July 12, 2019

Cheung, C.K., Kam, P.K. (2017). Conditions for pets to prevent depression in older adults. *Aging & Mental Health*, 22(12): 1627–1633.

- Chitic, V., Rusu, A.S., Szamoskozi, S. (2012). The Effects of Animal Assisted Therapy on Communication and Social Skills: A Meta-Analysis. *Transylvanian Journal of Psychology*, 13 (1): 1-17
- Chu, C.I., Liu, C.Y., Sun, C.T., Lin, J. (2009). The effect of animal-assisted activity on inpatients with schizophrenia. *J Psychosoc Nurs Ment Health Serv*, 47(12):42-8
- Crippa, A., Feijó, A.G. (2014). Animal- assisted activity as a complementary alternative to patient's treatment: search for scientific evidence. *Rev.latioam.bioet*, 14 (1): 14-25.
- Davidson, B. (2014). "Is Animal Assisted Therapy Using Dogs an Effective Treatment for Positive and Negative Symptoms for Adult Inpatient Schizophrenics?" PCOM Physician Assistant Studies Student Scholarship. Paper 159. Accessed at July 22, 2019
- Delta Society (2008). What are animal assisted activities/therapy? Available online on <http://www.deltasociety.org/Document.Doc?> Accessed at July 10, 2019
- Fine, A.H. (2018). The role of therapy and service animals in the lives of persons with disabilities. *Rev Sci Tech*, 37(1):141-149. doi: 10.20506/rst.37.1.2747.
- Foden, T., Anderson C. (2011). Dogs, horses and ASD: what are Animal- Assisted Therapies? Available from: [https://iancommunity.org/cs/articles/asds\\_and\\_animal\\_assisted\\_therapies](https://iancommunity.org/cs/articles/asds_and_animal_assisted_therapies). Accessed at June 30, 2019
- Friedmann, E., Son, H. (2009). The Human-Companion Animal Bond: How Humans Benefit. *Veterinary Clinics of North America: Small Animal Practice*, 39(2): 293-326. doi:10.1016/j.cvs.2008.10.015
- Hanson, E., Kalish, L.A., Bunce, E., Curtis, C.J., McDaniel, S., Ware, J., Petry, J.J. (2007). Use of complementary and alternative medicine among children diagnosed with autism spectrum disorder. *Autism and Developmental Disorders*, 37(4):628-636
- Horowitz, S. (2010). Animal-assisted therapy for inpatients: Tapping the unique healing power of the human-animal bond. *Alternative and Complementary Therapies*, 16(6): 339-343
- Hughes, M.J., Verreynne, M.-L., Harpur, P., Pachana, N.A. (2019). Companion Animals and Health in Older Populations: A Systematic Review. *Clinical Gerontologist*, p 1-13.
- Jackson, J. (2012). Animal- Assisted Therapy: The human-animal bond in relation to human health and wellness. Available from: [https://www.winona.edu/counseloreducation/images/justine\\_jackson\\_capstone.pdf](https://www.winona.edu/counseloreducation/images/justine_jackson_capstone.pdf). Accessed at June 12, 2019
- Kawamura, N., Niiyama, M., Niiyama, H. (2009). Animal-assisted activity: experiences of institutionalized Japanese Older Adults. *J Psychosoc Nurs Ment Health Serv*, 47(1):41-7
- Kruger, A.K., Serpell, J. (2010). Animal-Assisted Interventions in Mental Health: Definitions and Theoretical Foundations. In *Handbook on Animal-Assisted Therapy: Theoretical Foundations and Guidelines for Practice*, 4th edition, edited by Fine A.H, published by academic press, U.S.A. 2010, chapter: 2, pp.21-38.
- Mandrá, P.P., Moretti, T.C.D.F., Avezum, L.A., Kuroishi, R.C.S. (2019). Animal assisted therapy: systematic review of literature. *Codas*, 31(3):e20180243.
- Mangalavite A.M. (2014). Animal-Assisted Therapy: Benefits and Implications for Professionals in the Field of Rehabilitation. Available from: Research Papers. Paper 547. [http://opensiuc.lib.siu.edu/gs\\_rp/547](http://opensiuc.lib.siu.edu/gs_rp/547) Accessed at June 25, 2019
- Moretti, F., Ronchi, D.D., Bernabei, V., Marchetti, L., Ferrari, B., Forlani, C., et al. (2011). Pet therapy in elderly patients with mental illness. *Psychogeriatrics*, 11 (2): 125-9.
- Nordgren, L., Engström, G. (2012). Effects of animal assisted therapy on behavioral and/or psychological symptoms in dementia: a case report. *Am J Alzheimers Dis Other Demen*, 27(8):625-632
- Ogilvie, G.K. (2016). A Clinician's Viewpoints on Wellness and the Human-Animal Bond in Practice. *Advances in Small Animal Medicine and Surgery*, 29(9): 1-3.
- Perkins, J., Bartlett, H., Travers, C., Rand, J. (2009). Dog-assisted therapy for older people with dementia: a review. *Australasian Journal on Ageing*, 27(4):177-82 .
- Richeson, N.E. (2003). Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia. *American Journal of Alzheimer's Disease & Other Dementias*, 18(6) : 353-8
- Rossetti, J., King, C. (2010). Use of Animal-Assisted Therapy with Psychiatric Patients: A Literature Review. *Journal of Psychosocial Nursing and Mental Health Services*, 48(11):44-48
- Siewertsen, C.M., French, E.D., Teramoto, M. (2015). Autism spectrum disorder and pet therapy. *Adv Mind Body Med*, 29(2):22-5.
- Souter, M.A., Miller, M.D. (2007). Do animal-assisted activities effectively treat depression? A meta-analysis. *Anthrozoos*, 20 (2): 167-180.
- Tournier, I., Vives, M-F., Postal, V. (2017). Animal-assisted intervention in dementia: Effects on neuropsychiatric symptoms and on caregivers' distress perceptions. *Swiss Journal of Psychology*, 76(2):51-58
- Velde, B.P., Cipriani, J., Fisher, G. (2005). Resident and therapist views of animal-assisted therapy: Implications for occupational therapy practice.

- Australian Occupational Therapy Journal, 52 (1): 43–50
- Vilalta-Gil, V., Roca, M., Gonzalez, N., Domènech, E., Cuca, A.E., Asensio, M.R., et al. (2009). Dog-assisted therapy in the treatment of chronic schizophrenia inpatients. *Anthrozoos*, 22(2):149-159
- Virués-Ortega, J., Pastor-Barriuso, R., Castellote, J.M., Población, A., de Pedro-Cuesta, J. (2012). Effect of animal-assisted therapy on the psychological and functional status of elderly populations and patients with psychiatric disorders: A meta-analysis. *Health Psychology Review*, 6(2): 197–221.
- Yap, E., Scheinberg, A., Williams, K. (2017). Attitudes to and beliefs about animal assisted therapy for children with disabilities. *Complementary Therapies in Clinical Practice*, 26, 47–52.
- Wang S.S. (2013). Rise in Pets as Therapy for Mental Conditions: Animals Help People with Autism, PTSD, and other Conditions function day to day. Available from: <https://www.wsj.com/articles/rise-in-pets-as-therapy-for-mental-conditions-1383609937>. Accessed at July 5, 2019