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Animal Assisted Intervention for Rehabilitation Therapy and Psychotherapy

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Abstract

Animal-assisted Intervention (AAI) is a goal-oriented intervention that intentionally includes or incorporates animals in health, education, and human service for the purpose of therapeutic gains in humans. AAI incorporates human-animal teams in formal human service such as Animal-assisted Therapy (AAT) or Animal-assisted Education (AAE). Animal-assisted Activity (AAA) is the informal AAI often conducted on a volunteer basis by the human-animal team for motivational, educational, and recreational purposes. AAI could be used for rehabilitation therapy and psychotherapy for patients with various symptoms. AAI uses animals, mostly dogs, to aid in healing patients holistically. Dogs have an overwhelming gratitude and exuberance for life and this effect on people is astounding. Furthermore, AAI has been researched and its effectiveness on patients' outcomes and healing is documented. With a soaring trend of the incorporation of complementary therapies into the mainstream of therapy and health care, animal-facilitated therapy has become a popular interest for the therapy team to integrate into a patient's plan of therapy.

The purpose of this manuscript is to raise awareness about AAI and to familiarize readers with the concepts surrounding AAI so that they can be informed aids to clients who might benefit from the technique.

Keywords: Animal-assisted Intervention, Animal-assisted Therapy, Animal-assisted Education, Rehabilitation, Psychotherapy

1. Introduction

1.1. Definition of animal-assisted intervention

Animal-assisted Intervention (AAI) is a goal-oriented intervention that intentionally includes or incorporates animals in health, education and human service for the purpose of therapeutic gains in humans (Table 1). AAI incorporates human-animal teams in formal human service such as Animal-assisted Therapy (AAT) or Animal-assisted Education (AAE) [1].

AAT is a goal-oriented, planned, and structured therapeutic intervention directed and/or delivered by health, education, and human service professionals. Intervention progress is measured and included in professional documentation. AAT is delivered and/or directed by a formally trained professional with expertise within the scope of the professionals’ practice. AAT focuses on enhancing physical, cognitive, behavioral and/or socio-emotional functioning of the particular human client [1]. Figure 1 shows the scheme of animal-assisted therapy.

AAE is a goal-oriented, planned, and structured intervention directed and/or delivered by educational and related service professional. AAE is conducted by qualified general and special education teachers. Regular education teachers who conduct AAE must have knowledge of the animals involved. An example of AAE delivered by a regular education teacher is an educational visit that promotes responsible pet ownership. AAE, when done by special education teachers, is also considered therapeutic and a goal-oriented intervention. The focus of the activities is on academic goals, pro-social skills, and cognitive functioning. The student’s progress is measured and documented. An example of AAE delivered by a special education teacher is a dog-assisted reading program [1].

| | |
|--|---|
| Animal-assisted activity (AAA) | Provide opportunities for motivational, educational, and/or recreational benefits in order to enhance the quality of life of humans. AAA is delivered in a variety of environments by specially trained professionals and/or volunteers in association with animals that meet specific criteria of safety. |
| Animal-assisted therapy (AAT) | Are goal-directed interventions in which a specifically trained animal is an integral part of the treatment process. AAT is delivered and/or directed by a health/human service provider working within the scope of his or her profession. AAT is designed to promote improvement in human physical, social, emotional, and/or cognitive functioning. They are provided in a variety of settings and involve the individual. This process needs to be documented and evaluated throughout. |
| Animal-assisted education (AAE) | Relies on the use of animals for specific educational purposes, as is the case with problematic children characterized by behavioral problems. |

*Source: Cirulli et al. [2]

Table 1. Animal-assisted interventions (AAIs): Definitions

Animal-assisted Activity (AAA) is the informal interactions/visitations often conducted on a volunteer basis by the human-animal team for motivational, educational, and recreational

purposes. There are no treatment goals for the interactions. AAAs are generally facilitated by individuals who do not have a health, education, or human service degree. Human-animal teams have received at least introductory training, preparation, and assessment to participate in informal visitations. Human-animal teams who provide AAA may also work formally and directly with a healthcare, educator, and/or human service provider on specific documentable goals. In this case, they are participating in AAT or AAE that is conducted by a specialist in his/her profession. Examples of AAA include animal-assisted crisis response that focuses on providing comfort and support for trauma, crisis, and disaster survivors, and visiting companion animals for 'meet and greet' activities with residents in nursing homes [1].

Table 2 shows the characteristics of therapy animals for animal-assisted interventions. We can select an appropriate therapy animal for an AAI program.

| Kinds | Breed | Move | Contact | Emotional communication | Safety | Exercise | Pleasure of animal | Infectivity |
|-------------|-------|------|---------|-------------------------|--------|----------|--------------------|-------------|
| Fish | ★ | ▽ | ▽ | ◇ | ★ | ▽ | ◇ | ☆ |
| Reptiles | ◇ | ◇ | ◇ | ◇ | ☆ | ▽ | ◇ | ☆ |
| Avian | ★ | ◇ | ☆ | ◇ | ★ | ▽ | ◇ | ☆ |
| Hamster | ★ | ★ | ◇ | ◇ | ☆ | ◇ | ◇ | ☆ |
| Guinea pig | ★ | ★ | ★ | ◇ | ★ | ◇ | ◇ | ☆ |
| Rabbit | ★ | ★ | ★ | ☆ | ★ | ◇ | ◇ | ☆ |
| Sheep, Goat | ◇ | ◇ | ★ | ☆ | ☆ | ☆ | ◇ | ☆ |
| Cattle | ◇ | ◇ | ☆ | ☆ | ☆ | ☆ | ◇ | ☆ |
| Pig | ◇ | ◇ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Cat | ☆ | ☆ | ★ | ★ | ☆ | ☆ | ★ | ☆ |
| Dog | ☆ | ☆ | ★ | ★ | ☆ | ★ | ★ | ☆ |
| Horse | ◇ | ▽ | ☆ | ★ | ☆ | ★ | ☆ | ☆ |
| Dolphin | ▽ | ▽ | ☆ | ☆ | ☆ | ★ | ◇ | ☆ |
| Pet insect | ★ | ★ | ▽ | ▽ | ★ | ▽ | ▽ | ★ |
| Monkey | ▽ | ◇ | ◇ | ☆ | ▽ | ☆ | ☆ | ▽ |

★= Excellent, ☆= good, ◇ = Medium, ▽= Bad

Table 2. Characteristics of therapy animals for animal-assisted interventions (AAIs)

2. History of animal-assisted intervention

Animals and humans have existed in therapeutic relationships with each other for more than 12,000 years. In 1790 in York, England, rabbits and chickens were used in therapies with

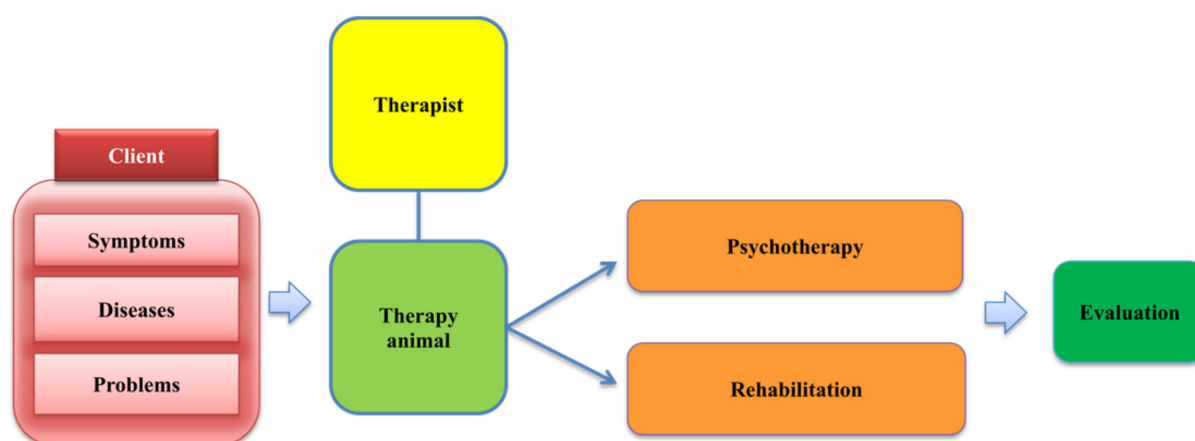


Figure 1. Scheme of animal-assisted therapy (AAT)

mentally ill patients learning self-control [3]. During the 1830s, the British charity commissioner recommended that mental institutions have animals on the grounds to create a more pleasing and less prison-like atmosphere [4]. Florence Nightingale observed that a small pet is often an excellent companion for the sick, especially for the chronic cases [4]. In 1867, epilepsy patients at Bethel in Bielefeld, West Germany had farm animals and horses incorporated into their treatment plans [5]. In 1942, the U.S. Army Air Corps Convalescent Hospital in Pawling, New York considered working with farm animals restful for some patients in comparison to traditional medical treatment [5].

In the 1960s, a New York psychologist, Dr. Boris Levinson, incorporated his dog, Jingles, in the treatment plan of an adolescent and then discussed his findings in a published paper titled “The Dog as the Co-therapist” in *Mental Hygiene* [6].

In 1980, McCulloch, Bustad, and Katcher founded the Delta Society, an international nonprofit organization focused on the “human-animal bond” (Delta Society; recently, changed as ‘Pet Partners’) [7]. This organization declared that its mission was “to promote animals helping people improve their health, independence, and quality of life” [3]. The goals of the organization include “expanding awareness of the positive effects animals can have on human health; removing the barriers that prevent involvement of animals in everyday life; and expanding the therapeutic role of animals in human health, service, and education.” The mission statement has now evolved to read simply “Improving human health through service and therapy animals” (Delta Society; recently, changed as ‘Pet Partners’) [7]. In 2008, the Korean Association of Animal Assisted Psychotherapy was founded in Korea (<http://www.kaaap.org/>). In 2012, Delta Society changed its name to Pet Partners.

We summarized the historical perspective of human and animal relationships and development of research in Table 3.

| | |
|------------------|---|
| 12,000 years ago | A human skeleton holding a puppy was found in northern Israel. |
| Ninth century | Animals were incorporated in treatment of the handicapped in Gheel, Belgium. |
| 1790 | Rabbits and chickens were used in therapy with the mentally ill in York, England. |
| 1830 | British charity commissioner recommended animals for mental institutions. |
| 1867 | Farm animals and horses were used in treatment of epilepsy patients at Bethel in Bielefeld, West Germany. |
| 1942 | Patients at U.S. Army Air Corps Convalescent Hospital, Pawling, New York worked with farm animals and considered treatment “restful”. |
| 1944 | Sociologist James Bossad’s publication “The Mental Hygiene of Owning a Dog” discussed beneficial relationships between pets and their owners. |
| 1962 | Psychologist Borris Levinson used his dog, Jingles, in the treatment of an adolescent; he published his findings in “The Dog as the Co-therapist”. |
| 1970s | A visiting therapy dog, Skeezer, became a permanent resident at Children’s Psychiatric Hospital, Ann Arbor, Michigan. Psychiatrist Michael McCulloch prescribed pets to patients. Veterinarian Leo Bustad started “Bustad Buddies” at Pullman Memorial Hospital and Tacoma Lutheran Nursing Home in Washington. |
| 1972 | Psychotherapist Boris Levinson conducted a survey and found that one third of New York psychotherapists used pets in treatment |
| 1973 | Humane Society’s “pet mobile” program brought animals to visit nursing homes in Pikes Peak region, Colorado. |
| 1977 | Dr. Dean Katcher and Erika Friedmann conducted early research on effects of pets on blood pressure and mortality rates. |
| 1980 | Delta Society, a nonprofit organization focused on the human–animal bond, was founded. |
| 2008 | Korean Association of Animal Assisted Psychotherapy was founded in Korea. |
| 2012 | Delta Society changed its name to Pet Partners. |

*Modified source: Morrison [8]

Table 3. Historical perspective of human and animal relationships and development of research

3. Benefits of human-animal bond

Animals and humans have existed in therapeutic relationships with each other for more than 12,000 years. One of the earliest cited findings is the skeletal remains, found in northern Israel, of a human holding a puppy. In Gheel, Belgium, in the ninth century, animals were used in treatment plans with handicapped persons [4]. In 1790 in York, England, rabbits and chickens were used in therapies with mentally ill patients learning self-control [3].

The American Veterinary Medical Association’s Committee on the Human-Animal Bond defines the human-animal bond as, "a mutually beneficial and dynamic relationship between

people and other animals that is influenced by behaviors that are essential to the health and well-being of both. This includes, but is not limited to, emotional, psychological, and physical interactions of people, other animals, and the environment". [9].

The human-animal bond has been described as the mutually beneficial and dynamic relationship between people and other animals that is influenced by behaviors essential to the health and well-being of both. This includes, but is not limited to, emotional, psychological, and physical interactions of people, other animals, and the environment [9].

Figure 2 shows an animal-assisted therapy program for the children with autism in Korea. We summarized the benefits of animal-assisted interventions in Figure 3.



Figure 2. Animal-assisted therapy program for the children with autism

4. Animal-assisted intervention for rehabilitation therapy

AAI is the utilization of animals as a therapeutic modality to facilitate healing and rehabilitation of patients with acute or chronic ailments [10]. Many elderly and lonely individuals have discovered that pets satisfy their needs and enable them to hold on to the world of reality, of care, of human toil and sacrifice, and of intense emotional relationships. The incorporation of animal services for the benefit of human health has been established and implemented in various countries such as the United States and the United Kingdom for many years.

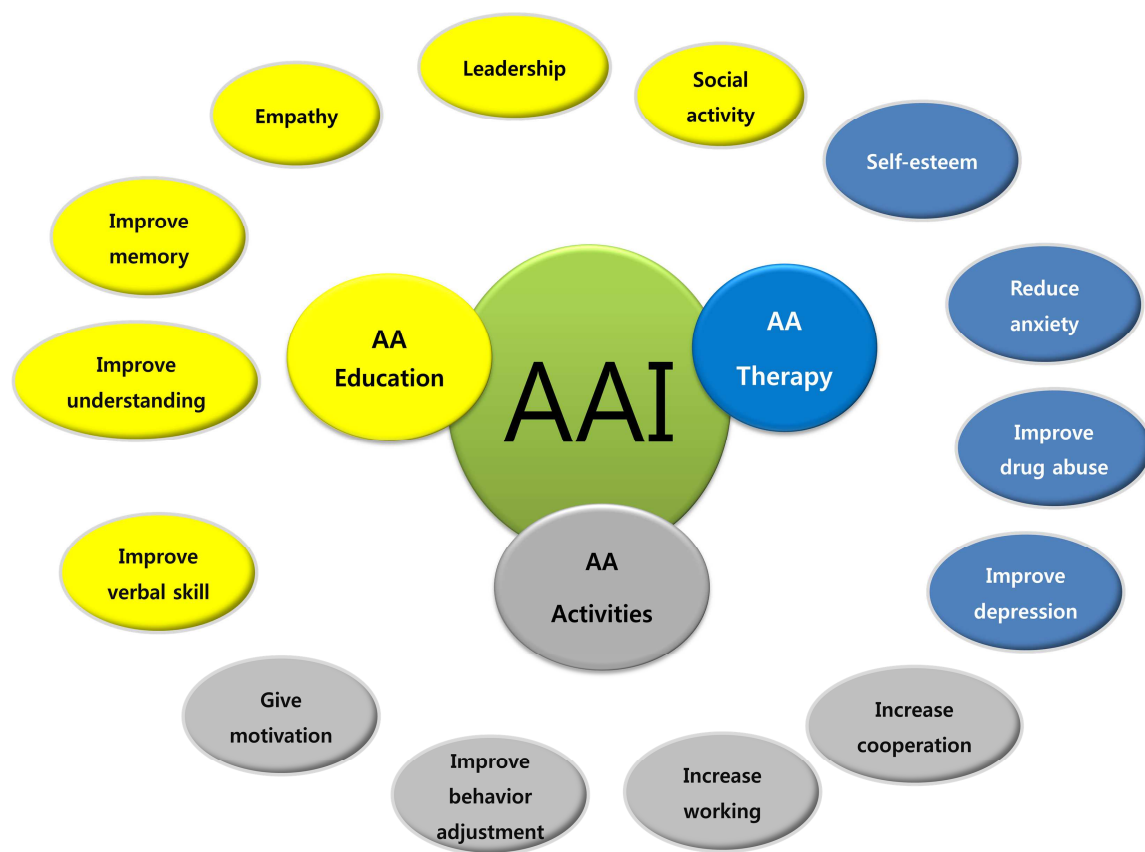


Figure 3. Benefits of animal-assisted interventions

Animal assisted intervention has been used with people of all ages from the elderly to young children. Programs span a wide range of situations and conditions, including older people with Alzheimer’s disease; the emotionally and mentally ill; developmentally delayed children and adults; and children with Down’s syndrome, cerebral palsy, brain damage, and learning disabilities. The key factor of all such programs that can be called AAT is that animals are utilized not just as entertainment or for companionship but in a goal-directed way that is assessed and evaluated for its impact. They also involve trained workers and suitably selected animals.

Animals can assist the physically handicapped in a variety of ways. Therapeutic riding is being used for persons with cerebral palsy, muscular dystrophy, multiple sclerosis, and others with diminished motor control. It helps to improve their posture, balance, mobility, and function. It also provides significant emotional and cognitive benefits. Figure 4 shows an animal-assisted therapy program for the elderly with dementia in Korea.

5. Animal-assisted intervention for psychotherapy

Animals tend to focus and absorb people’s attention in non-threatening ways and are also known to exert a calming or de-arousing influence [11–13]. Moreover, the ability of domesti-



Figure 4. Animal-assisted therapy program for the elderly with dementia

cated animals to respond affectionately to human attentions and to elicit pro-social behavior and positive effect may serve as an emotional bridge to mediate interactions in therapeutic contexts [14].

There is increasing evidence suggesting that a close relationship with a pet animal is associated with significant health effects in people. The presence of an animal, or even the mere observation of animals [12, 15], can buffer physiological and psychological responses to stress and anxiety; as an example, a transient decrease in blood pressure and heart rate has been observed in adults and children in the presence of a companion dog as well as while interacting with friendly but unknown dogs [16, 17]. The presence of an animal, particularly a dog, is able to act as an “ice-breaker”; it catalyzes communication and enhances opportunities for social exchange and shared interests who, in turn, can promote a feeling of social integration [18]. Different animals are purposely included in various therapeutic/activity programs also known as AAIs, which are receiving growing attention in the fields of nursing, medicine, and psychotherapy because of their potential to influence a large number of health-related problems in different clinical populations. Figure 5 shows Animal-assisted therapy program for children with depression in Korea.

6. Field studies of animal-assisted intervention

Based on the research to date, AAIs may be indicated for but not limited to patients of all ages who need improvement in mood, motivation, self-esteem, and physical and psychological



Figure 5. Animal-assisted therapy program for children with depression

well-being. This includes men, women, and children of all ages who have had pertinent precautions and safety issues addressed. Specific medical indications include but are not limited to autism, dementia, chronic diseases, mental disorders, and neurological disorders including aphasia and epilepsy [19–24].

Settings that are appropriate for AAIs may include, but are not limited to, institutional settings such as hospitals, nursing homes, hospice care, mental health facilities, schools, and correctional facilities. Other settings may include the home, farm, or alternative locations with access to therapeutic animals such as dolphins [25].

Animals involved in AAI include, but are not limited to, dogs, cats, horses, donkeys, dolphins, birds, gerbils, hamsters, rabbits, and fish. Most commonly used in previous research is AAI that involves dogs and is the most common type of AAI. AAI with dogs is used with a wide variety of populations and is found in both group and individual therapy settings. The interaction between dogs and clients is an important aspect in canine-assisted therapy [26, 27].

We summarized the research publications in the field of animal-assisted interventions in Table 4.

| Human disorders | Researches of animal-assisted interventions |
|--------------------------------------|---|
| Senile dementia, Alzheimer’s disease | [23, 28–33] |
| Psychiatric disorders, schizophrenia | [34–40] |
| Autism | [24, 42–45] |
| Cancer | [45–47] |
| Chronic heart failure | [48, 49] |
| Spinal cord injury | [50] |
| Cerebral palsy | [51] |
| Multiple sclerosis | [52] |
| Language disorders, aphasia | [53–56] |

*Source: Cirulli et al. (2011)

Table 4. Research publications in the field of animal-assisted interventions

7. Vision and prospects of animal-assisted intervention

In AAI, the activity performed by the “animal therapist” towards the “human patient” is very complex and to be successful, above all, should entail the contribution of many professional figures. For this reason, a combined effort of a cross-disciplinary team made up of various professional categories should always characterize an AAI program. These categories interact and bring their own specific contribution in a complementary way.

The “therapeutic potential” of AAI could vary according to the animal species involved. As an example, dogs’ ability to develop a complex communication system with humans, enhanced by the domestication process, makes these animals particularly able to increase responsiveness and willingness to communicate. By and large, domesticated animals should be used as they have been selected for their ability to interact socially (and emotionally) with humans.

8. Conclusion

AAIs, which include both AAA and AAT, have historically been beneficial to human health. AAIs are modalities that offer an integrative approach to enhance the treatment of various

health concerns. Although many healthcare professionals and facilities use AAIs in the treatment of patients or clients, extensive opportunities are still available for further implementation into healthcare.

In Korea, the Korean Association of Animal Assisted Psychotherapy (KAAAP) was founded in 2008 (<http://www.kaaap.org/>). KAAAP has performed a lot of research projects and archived positive functioning outcomes for various clients following AAI using human-animal interaction. The use of AAI appears to provide a valuable addition to clinical treatment practices and therefore are worthy of further investigation.

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References

- [1] IAHAIO. White paper. The IAHAIO definitions for animal-assisted intervention and animal-assisted activity and guidelines for wellness of animals involved. 2014.
- [2] Cirulli F, Borgi M, Berry A, Francia N and Alleva E. Animal-assisted interventions as innovative tools for mental health. *Ann. Ist. Super. Sanità.* 2011; 47: 341-348.

- [3] Salotto P. Pet-assisted therapy: A loving intervention and an emerging profession: Leading to a friendlier, healthier, and more peaceful world. Norton, MA: D. J. Publications. 2001.
- [4] Serpell JA. Animal-assisted interventions in historical perspective. In A. H. Fine (Ed.), *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice* (2nd ed., Chap. 1). New York: Academic Press. 2006.
- [5] Bustad L. Animals, aging and the aged. Minneapolis: University of Minnesota Press. Levinson, B. (1962). The dog as co-therapist. *Mental.Hygiene*. 1980;46:59-65.
- [6] Levinson BM. The dog as a "co-therapist". *Ment Hyg*. 1962;46:59-65.
- [7] Delta Society. Introduction to animal assisted activities and therapies. 2005; Retrieved December 10, 2006, from <http://www.deltasociety.org/AnimalsAAAAbout.htm>.
- [8] Morrison ML. Health Benefits of Animal-assisted Interventions. *Complementary Health Practice Review* 2007;12:51-62. DOI: 10.1177/1533210107302397.
- [9] Olson PN. The modern working dog—a call for interdisciplinary collaboration. *J. Am. Vet. Med. Assoc*. 2002;352-355.
- [10] Curran G. Role animals take with therapy modalities for rehabilitation patients. *Community Medicine*. 1996;6:29-36.
- [11] DeSchrivier M, Riddick C. Effects of watching aquariums on elders' stress. *Anthrozoös*. 1990;4:44-48.
- [12] Katcher AH, Friedmann E, Beck AM, Lynch JJ. Looking, talking and blood pressure: The physiological consequences of interaction with the living environment. In: Katcher AH, Beck AM (Ed.). *New perspectives on our lives with companion animals*. Philadelphia: University of Pennsylvania Press; 1983.
- [13] Wilson CC. The pet as an anxiolytic intervention. *J. Nerv. Ment. Dis*. 1991;179:482-489.
- [14] Serpell J. *In the company of animals: A study of human-animal relationships*. Cambridge: Cambridge University Press; 1996.
- [15] Wells D. The effect of videotapes of animals on cardiovascular responses to stress. *Stress Health* 2005;21:209-213.
- [16] Friedmann E, Thomas S, Cook L, Tsai C, Picot S. A friendly dog as potential moderator of cardiovascular response to speech in older hypertensives. *Anthrozoös*. 2007;20:51-63.
- [17] Allen K, Blascovich J, Mendes WB. Cardiovascular reactivity and the presence of pets, friends, and spouses: The truth about cats and dogs. *Psychosom. Med*. 2002;64:727-739.
- [18] Knight S, Edwards V. In the company of wolves: The physical, social, and psychological benefits of dog ownership. *Journal of Aging and Health*. 2008;20:437-455.

- [19] Allen K, Shykoff B, Izzo JL. Pet ownership, but not ACE inhibitor therapy, blunts home blood pressure responses to mental stress. *Hypertension*. 2001;38:815-820.
- [20] Filan SL, Llewellyn-Jones RH. Animal-assisted therapy for dementia: A review of the literature. *International Psychogeriatric*. 2006;18:597-611.
- [21] Kaminski M, Pellino T, Wish J. Play and pets: The physical and emotional impact of child-life and pet therapy and hospitalized children. *Children's Health Care*. 2002;31:321-335.
- [22] Macauley BL. Animal-assisted therapy for persons with aphasia: A pilot study. *Journal of Rehabilitation Research and Development*. 2006;43:357-366.
- [23] Richeson NE. Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia. *Am. J. Alzheimers. Dis. Other. Demen*. 2003;18:353-358.
- [24] Sams MJ, Fortney EV, Willenbring S. Occupational therapy incorporating animals for children with autism: A pilot investigation. *American Occupational Therapy Association*. 2006;60:268-274.
- [25] Arkow P. Animal-assisted therapy and activities: A study, resource guide and bibliography for the use of companion animals in selected therapies (9th ed.). Stratford, NJ: Phil Arkow.2004.
- [26] Fine A. (ed.). Handbook on animal-assisted therapy; Theoretical foundations and guidelines for practice (3rd ed.). San Diego, CA: Academic Press.2010.
- [27] Thompson MJ. Animal-assisted play therapy: Canines as co-therapist. In G. R. Walz, J. C. Bleuer, & R. K. Yep (Eds.), *Compelling counseling interventions: VISTAS 2009* (pp. 199-209). Alexandria, VA: American Counseling Association. 2009.
- [28] Kanamori M, Suzuki M, Yamamoto K, Kanda M, Matsui Y, Kojima E. A day care program and evaluation of animal-assisted therapy (AAT) for the elderly with senile dementia. *Am. J. Alzheimers. Dis. Other. Demen*. 2001;16:234-239.
- [29] Edwards NE, Beck AM. Animal-assisted therapy and Nutrition in Alzheimer's disease. *West. J. Nurs. Res*. 2002;24:697-712.
- [30] Marx MS, Cohen-Mansfield J, Regier NG, Dakheel-Ali M, Srihari A, Thein K. The impact of different dog-related stimuli on engagement of persons with dementia. *Am. J. Alzheimers. Dis. Other. Demen*. 2010;25:37-45.
- [31] Motomura N, Yagi T, Ohyama H. Animal assisted therapy for people with dementia. *Psychogeriatrics* 2004;4:40-42.
- [32] McCabe BW, Baun MM, Speich D, Agrawal S. Resident dog in the Alzheimer's special care unit. *West. J. Nurs. Res*. 2002;24:684-696.

- [33] Kramer SC, Friedmann E, Bernstein PL. Comparison of the effect of human interaction, animal-assisted therapy, and AIBO-assisted therapy on long-term care residents with dementia. *Anthrozoös*. 2009;22:43-57.
- [34] Barker SB, Pandurangi AK, Best AM. Effects of animal assisted therapy on patients' anxiety, fear, and depression before ECT. *J. Ect*. 2003;19:38-44.
- [35] Prothmann A, Bienert M, Ettrich C. Dogs in child psychotherapy: Effects on state of mind. *Anthrozoös*. 2006;19:265-277.
- [36] Berget B, Ekeberg O, Braastad BO. Animal-assisted therapy with farm animals for persons with psychiatric disorders: Effects on self-efficacy, coping ability and quality of life, a randomized controlled trial. *Clin. Pract. Epidemiol. Ment. Health*. 2008;4:9.
- [37] Barak Y, Savorai O, Mavashev S, Beni A. Animal-assisted therapy for elderly schizophrenic patients: A one-year controlled trial. *Am. J. Geriatr. Psychiatry*. 2001;9:439-442.
- [38] Kovacs Z, Kis R, Rozsa S, Rozsa L. Animal-assisted therapy for middle-aged schizophrenic patients living in a social institution. A pilot study. *Clin. Rehabil*. 2004;18:483-486.
- [39] Nathans-Barel I, Feldman P, Berger B, Modai I, Silver H. Animal-assisted therapy ameliorates anhedonia in schizophrenia patients. A controlled pilot study. *Psychother.Psychosom*. 2005;74:31-35.
- [40] Chu CI, Liu CY, Sun CT, Lin J. The effect of animal-assisted activity on inpatients with schizophrenia. *J. Psychosoc. Nurs. Ment. Health. Serv*. 2009;47:42-48.
- [41] Bizub AL, Joy A, Davidson L. It's like being in another world: Demonstrating the benefits of therapeutic horseback riding for individuals with psychiatric disability. *Psychiatr. Rehabil. J*. 2003;26:377-384.
- [42] Silva K, Correia R, Lima M, Magalhaes A, de Sousa L. Can dogs prime autistic children for therapy? Evidence from a single case study. *J. Altern. Complement. Med*. 2011;17:655-659.
- [43] Solomon O. What a dog can do: Children with autism and therapy dogs in social interaction. *ETHOS, Journal of the Society for Psychological Anthropology*. 2010;38:143-166.
- [44] Bass MM, Duchowny CA, Llabre MM. The effect of therapeutic horseback riding on social functioning in children with autism. *J. Autism. Dev. Disord*. 2009;39:1261-1267.
- [45] Bouchard F, Landry M, Belles-Isles M, Gagnon J. A magical dream: A pilot project in animal-assisted therapy in pediatric oncology. *Can. Oncol. Nurs. J*. 2004;14:14-17.
- [46] Orlandi M, Trangeled K, Mambrini A, Tagliani M, Ferrarini A, Zanetti L. Pet therapy effects on oncological day hospital patients undergoing chemotherapy treatment. *Anticancer. Res*. 2007;27:4301-4303.

- [47] Johnson RA, Meadows RL, Haubner JS, Sevedge K. Animal-assisted activity among patients with cancer: Effects on mood, fatigue, self-perceived health, and sense of coherence. *Oncol. Nurs. Forum.* 2008;35:225-232.
- [48] Cole KM, Gawlinski A, Steers N, Kotlerman J. Animal-assisted therapy in patients hospitalized with heart failure. *Am. J. Crit. Care* 2007;16:575-585.
- [49] Abate SV, Zucconi M, Boxer BA. Impact of canine-assisted ambulation on hospitalized chronic heart failure patients' ambulation outcomes and Satisfaction: A Pilot Study. *J. Cardiovasc. Nurs.* 2011;26:224-230.
- [50] Lechner HE, Kakebeeke TH, Hegemann D, Baumberger M. The effect of hippotherapy on spasticity and on mental well-being of persons with spinal cord injury. *Arch. Phys. Med. Rehabil.* 2007;88:1241-1248.
- [51] McGibbon NH, Benda W, Duncan BR, Silkwood-Sherer D. Immediate and long-term effects of hippotherapy on symmetry of adductor muscle activity and functional ability in children with spastic cerebral palsy. *Arch. Phys. Med. Rehabil.* 2009;90:966-974.
- [52] Silkwood-Sherer D, Warmbier H. Effects of hippotherapy on postural stability, in persons with multiple sclerosis: A pilot study. *J. Neurol. Phys. Ther.* 2007;31:77-84.
- [53] Gee N, Harris S, Johnson K. The role of therapy dogs in speed and accuracy to complete motor skills tasks for preschool children. *Anthrozoös.* 2007;20:375-386.
- [54] Macaulay B, Gutierrez K. The effectiveness of hippotherapy for children with language-learning disabilities. *Commun. Disord. Q.* 2004;25:205-217.
- [55] Martin F, Farnum J. Animal-assisted therapy for children with pervasive developmental disorders. *West J. Nurs. Res.* 2002;24:657-670.
- [56] LaFrance C, Garcia LJ, Labreche J. The effect of a therapy dog on the communication skills of an adult with aphasia. *J. Commun. Disord.* 2007;40:215-224.

