

Nature-Based Therapy: Its Potential as a Complementary Approach to Treating Communication Disorders

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Abstract:

Nature-based therapy (NBT) has been incorporated into the practice of many medical and mental health professions. Occupational therapists, physical therapists, nurses, social workers, psychologists, and to a lesser extent, speech-language pathologists have used NBT practices as a complementary means of treating a variety of physical, emotional, and cognitive disorders. This article includes a description of NBT and the three types that comprise the practice and a review of the literature demonstrating the use of NBT in the general population and, more specifically, with individuals with neurogenic communication disorders. It concludes with a discussion of directions for future research of NBT.

Keyword: Nature-based therapy | animal-assisted therapy | horticultural therapy | natural environment therapy | complementary and alternative medicine | treating communication disorders | neurogenic communication disorders

Article:

Complementary and alternative medicines (CAM) are frequently grouped into four categories: (1) body-oriented treatment (e.g., yoga); (2) energy-based therapy (e.g., acupuncture); (3) mind/body therapy (e.g., meditation); and (4) nature as healer (e.g., animal-assisted therapy or AAT). Recently, there has been a surge of interest in the concept of nature as healer. This interest has emerged in several fields such as psychology, biology, and general medicine. In light of this interest it is becoming increasingly more important that an individual be examined with careful consideration of the dynamic interaction between the individual and his or her external environment. It is now thought that the social, emotional, cognitive, and linguistic behaviors of humans cannot be accurately assessed in isolation from their natural environment.

Communication is an example of a human behavior that is highly influenced by both the nature of the human organism and the events and properties inherent in the interaction between the person and his or her environmental context. When communication is disrupted, several changes may ensue. The changes include the way the individual is perceived by others, the way in which

this individual interacts with others, and in the way others respond to the individual, all of which can cause the individual to experience increased anxiety and stress, social disconnection, social isolation, and loss of social relationships. Furthermore, physical and psychological well-being may be affected by these emotional and social changes. In fact, according to several studies, social disconnection may be the most stressful type of event that an individual can endure. Cacioppo states that social disconnection "...is as large a risk factor for broad-based morbidity and mortality as high blood pressure, obesity, and sedentary lifestyle...." One form of CAM, nature-based therapy (NBT), attempts to decrease stress and social isolation and thus promote well-being through a reattachment of individuals to their embedded environment.

This article begins with a description of NBT and the three types that comprise the practice. This section is followed by a review of the literature demonstrating the use of NBT in the general medical population and more specifically with individuals with neurogenic communication disorders. The article concludes with a discussion of directions for future research of NBT.

NATURE-BASED THERAPY

Many disciplines, including psychology, biology, medicine, and even architectural design, have witnessed the emergence of literature regarding the influences of the environment on human health and our sense of well-being. More specifically, studies in each of these disciplines have addressed the healing potential of the natural environment. This interest is in keeping with the theory of biophilia put forth by Pulitzer Prize-winning biologist Edward O. Wilson. According to Wilson, there is an "...innately emotional affiliation of human beings to other living organisms" and it is this attraction and connection to other living organisms that results in improved human health and general well-being. According to several investigators, these improvements are a direct result of nature's ability to provide humans with restoration from stress and attentional fatigue. The field of NBT attempts to capitalize on the restorative ability of the natural environment through interactions with plants, animals, and natural landscapes. NBT is typically divided into three types: (1) AAT, (2) horticultural therapy, and (3) natural environment therapy.

Animal-Assisted Therapy

As early as the late 17th century the positive relationship between humans and animals was discussed in the literature. In 1699, John Locke advocated giving children small animals to facilitate nurturing and a sense of responsibility for others. In the late 18th century, animals were used to facilitate social interactions in the mentally ill. During the 19th century, pets became common companions to residents in mental institutions and other long-term care hospitals. The renowned nurse Florence Nightingale wrote of the benefits of animal companionship for individuals with chronic physical ailments. In the early decades of the 20th century, despite historic reports of the benefits of animals to the overall well-being of individuals, animals were eliminated from medical settings and only mentioned in the context of disease and public health with negative references to animals who were associated with psychological dysfunction (i.e., "wild beasts," "animal drives"). Later in the 20th century, however, medical and mental health professionals once again became interested in the therapeutic role of animals. For example, Bossard published a 1944 paper entitled "The Mental Hygiene of Owning a Dog." In this paper,

he discussed the therapeutic effect of animal ownership, based on his own personal observations and some case studies. In 1962, Boris Levinson wrote an article entitled, "The Dog as a Co-Therapist", in which he expanded on Bossard's concept of the pet as a valuable asset to the family and the value of pets to individuals involved in psychotherapy. Today, Levinson is known as the founder of "pet-facilitated therapy," now more commonly referred to as AAT or animal-assisted activities (AAA). The Delta Society defines AAT as

...a goal-directed intervention in which an animal that meets specific criteria is an integral part of the treatment process. AAT is directed and/or delivered by a health/human service professional with specialized expertise and within the scope of practice of his/her profession. AAT is designed to promote improvement in human physical, social, emotional, and/or cognitive functioning.

Animal-assisted activities (AAA) typically are not goal-directed activities, but rather casual interactions between animals and humans. For example, a volunteer may bring a trained therapy dog into a nursing home for a visit with the residents. Organizations such as the Delta Society have published guidelines for AAT/AAA and for implementing AAT/AAA programs.

The benefits of AAT/AAA were formally investigated by a variety of professional disciplines in a wide range of patient populations, but it was not until 1980 that the first study of the health benefits of animals was reported in a peer-reviewed medical journal. This study compared the 1-year survival rate of 92 patients discharged from a coronary care unit. Friedman and colleagues carefully followed up on each of the patients following discharge and found that 14 of the original patients had died in the first year. When investigating the differences between those who survived and those who did not, Friedman discovered that pet ownership increased the likelihood of 1-year survival. This study spurred discussion in both the medical and mental health fields about potential reasons for the findings. The results of the 1980 study and those that followed gave rise to two explanations as to why individuals who interacted with animals experienced improved well-being: (1) animals facilitated a relaxation response in humans and (2) animals are social facilitators, providing social lubrication for their owners in social settings. These two explanations motivated subsequent AAT/AAA studies.

ANIMALS FACILITATING A RELAXATION RESPONSE

In one group of studies, investigators used animals to facilitate a "relaxation response." A relaxation response is a physical state of deep rest that changes a person's physical and emotional responses to stress (e.g., decreased heart rate, blood pressure, and muscle tension). A relaxation response is a response that is associated with a feeling of calmness. In contrast, a "stress response" is accompanied by anxiety, anger, and depression. According to Herbert Benson, president of the Mind Body Medical Institute located in Boston, MA, the relaxation response, if practiced regularly, can have a lasting effect on individuals who regularly encounter stress and can result in improved health.

For the most part, relaxation studies have looked at the effects of various relaxation techniques (meditation, guided imagery, relaxation response) on groups of individuals with medical problems or groups of individuals undergoing procedures. For example, Katcher and colleagues

looked at the role of animals in eliciting relaxation and reducing stress prior to oral surgery. The subjects were randomly assigned to one of five experimental conditions: (1) 30 minutes looking at fish in an aquarium with hypnosis and (2) without hypnosis; (3) 30 minutes looking at a picture of a nature landscape with hypnosis and (4) without hypnosis; (5) 30 minutes sitting quietly. Each subject's level of relaxation during the surgical procedure was scored independently by the surgeon, the investigator, and the subject through a subjective survey. Results showed that the subjects who watched the fish in the aquarium, with or without hypnosis, were judged to be the most relaxed during the surgery.

Harbor and Kahn compared the effects of speech-language therapy augmented with AAT using a certified therapy dog and a dog handler to speech-language therapy without AAT on a 60-year-old male with a diagnosis of primary progressive aphasia. Results indicate that the patient's communicative efficiency and word-finding improved at a greater rate in the presence of an animal (AAT) as compared with standard treatment.

Kahn and Jacobs observed discourse patterns between a 51-year-old male, 11 years post stroke with left hemiplegia, and the therapist during standard physical therapy versus physical therapy augmented with AAT. Results indicate that both the patient and the therapist were influenced by the augmented condition. When physical therapy occurred in the presence of a therapy dog, the therapist produced fewer verbal cues and fewer verbal requests than during standard treatment. At the same time, the patient spontaneously expanded on verbal requests and yes/no responses to verbal requests by the therapist. This finding contrasts with the frequently noted pattern of the therapist talking notably more than patients during therapy sessions. The authors posited that this variation in discourse patterns resulted because (1) AAT facilitated a more focused session for the physical therapist and (2) the therapy dog facilitated focused attention and concentration in the patient. Furthermore, according to the authors, the patient reported feeling more natural when performing these motor activities with the assistance of the therapy dog. It may be that the therapy dog facilitated a relaxation response in this individual, which allowed for the improved attention and concentration as well as the expanded verbalization. It is well documented in the speech and language literature that stress can cause or exacerbate communication problems, such as a voice disorder, stuttering, and perseveration. Furthermore, with reduced stress there may be improved communication. Elsewhere in this issue of *Seminars in Speech and Language*, Murray and Kim point out that a relaxation-type therapy may in fact “remediate certain neurogenic cognitive and communication disorders.”

Neural mechanisms for the effects of meditation and relaxation were explored by Lazar and associates, who performed functional brain mapping of five right-handed nonclinical subjects who had had at least 4 years of kundalini meditation experience, during two different activities involving silent verbalization. The first activity involved the brain scanning of subjects during the initial and later stages of a kundalini meditation period. During kundalini meditation, the subject passively observes his or her own breathing and silently repeats a mantra on inhalation and a different mantra on exhalation for a total of 24 minutes. The second activity involved the brain scanning of subjects who were not observing their breathing, while they silently generated a list of random animals. The investigators found that upon comparing both of the silent

verbalization activities, it was only the meditation activity that activated neural structures involved in attention (frontal and parietal cortex) and arousal/control of the autonomic nervous system (amygdala, midbrain, and hypothalamus). The investigators conclude that functional magnetic resonance imaging “is useful for studying the changes in brain activity that occur during the practice of meditation” and this may eventually lead “...to a greater acceptance of the relaxation response as a complement to other medical treatment.”

ANIMALS AS SOCIAL FACILITATORS

A group of studies has investigated the use of animals to promote well-being through facilitation of socialization since people appear to be more receptive to socialization in the presence of pets. Exposure to pets may then facilitate social networking and provide opportunity for social support. The importance of physical and psychological well-being has been well documented in the medical literature. There are factors indicating that these positive social relationships buffer the negative health effects associated with stress. Furthermore, it has been reported that having social relationships may prevent some cognitive decline in old age and animals may assist in maintaining or establishing these crucial social relationships. For example, in one study it was found that dogs exposed their owners to more opportunities for socialization, facilitated the social interaction between strangers, and helped establish trust among newly acquainted people in social situations. The literature on animal-human interaction suggests that individuals exposed to animals may experience not only health and social benefits, but that this then leads to emotional and communicative benefits.

In 1975, Mugford and M'Comisky conducted one of the most widely cited studies on the therapeutic value of pets to the elderly. In this study, a bird was placed in the homes of elderly adults for a 5-month period. A control group of elderly home dwellers did not receive a pet. At the end of the 5-month period, the group that lived with the bird demonstrated “improved social attitudes, mental health, and happiness” and, reportedly, the birds became the major topics of discussions for the elderly group who cared for the birds. Since this study, there have been a handful of others looking at the impact of the human-animal bond on social and emotional factors.

Batson and colleagues reported the effects of therapeutic dogs on the social and physiological responses of a group of 22 individuals with Alzheimer's disease (AD). Physiological measures of heart rate, skin temperature, and blood pressure were recorded every 2 minutes during the 10-minute session with or without a dog present and socialization measures such as smiles, tactile contact, physical warmth, praise, and body positioning also were measured. Increased social responsiveness was observed in this group when exposed to therapy dogs, yet no significant physiological differences were apparent. The authors stated that these findings suggest that pets can serve as a useful intervention tool for increasing socialization in individuals with AD as measured by the increase in social responses when exposed to the therapy dog.

Greer and colleagues compared the communication behaviors of six female nursing home residents with dementia of the Alzheimer's type (DAT) when exposed to two toy cats versus two live cats. Communication (total number of words, meaningful information units, and verbal

initiation) was analyzed for the group during three conditions: (1) without stimuli, (2) in the presence of the toy cats, and (3) in the presence of the live cats. The results indicated that live cats had the greatest influence on average subject performance across all communication measures.

In a recent article in the *ASHA Leader*, Lewis reported anecdotal data on a group of three preschool children exposed to a therapy dog during their speech-language treatment sessions. Performance was compared on pragmatics, receptive language, expressive language, and phonology during sessions with and without the therapy dog. According to Lewis, each child demonstrated more gains during the treatment period with the dog on all measures except phonology. The results, presented at a poster session at the annual conference for the American Speech-Language Hearing Association, suggest that therapy dogs may facilitate progress in children with language impairments.

The value of the human-animal bond has been investigated over many years in the medical, mental health, nursing, occupational therapy, and vocational therapy literature. Several studies support the therapeutic use of this human-animal bond. Recently, there has been an increased interest in the use of AAT/AAA as a complementary therapeutic approach in speech-language pathology. Additional studies are needed to determine the therapeutic utility of this complementary treatment technique for addressing communication disorders. Before speech-language pathologists attempt to use this technique in the therapeutic session, the following guidelines are recommended:

1. Consult the speech-language pathology literature for the most updated findings using AAT/AAA.
2. Determine whether the patients are willing to use this type of treatment technique.
3. Review specific laws of the state and facility regarding the use of AAT/AAA.
4. Ensure safety and well-being for both the patient and the animal.
5. Seek professional AAT/AAA training through an agency such as the Delta Society.

Horticultural Therapy

Another domain of NBT is horticultural therapy (HT). Although plants are most commonly associated with the production of food, they are also used for medical purposes and there are references in early Egyptian documents to physicians prescribing walks in the garden for their patients' well-being. By the 1800s, hospitals throughout Europe used gardening as a means of treating mentally ill patients and this approach spread to the United States following World War II. During this time, throughout the United States, members of garden clubs volunteered to assist veterans, in several hospitals, to grow and cultivate plants. Health-care delivery personnel assumed that this nature-based activity would have a curative effect on wounded soldiers. During the 1950s, 1960s, and 1970s, several HT programs were developed in the United States and in 1973 the National Council for Therapy and Rehabilitation through Horticulture, later renamed the American Horticultural Therapy Association, was established.

Although HT programs differ from one institution to another, the field of HT has remained committed to its goal of improving the physical and mental health of the individual. Professional horticultural therapists, allied health professionals, or volunteers implement horticultural programs to achieve these goals. To be considered HT, treatment activities must focus on the cultivation of plants. Reportedly, HT is ideal for promoting improvement in intellectual, social, emotional, and physical functioning; however, few studies have carefully examined these factors. Sarno and Chambers studied the effects of HT on 19 aphasic individuals in a pilot horticultural program designed to promote plant care as a leisure-time activity. Patients were all members of the Aphasia Community Group at the Rusk Institute for Rehabilitation Medicine in New York. At the beginning of this program, the participants ranged in age from 49 to 90 years, were 1.5 to 13.5 years post onset of aphasia, and ranged in severity of aphasia from mild to severe. The Pilot Horticultural Program "...was designed to meet the patients' treatment goals in both functional and cognitive areas." In addition, this program attempted to capitalize on recent research indicating that gardens have a restorative effect on individuals. According to the authors, the Pilot Horticultural Program was designed specifically to do the following: "1) provide a well-rounded introduction to horticulture as a leisure activity, 2) engage in horticultural activities which have avocational values, 3) decrease stress, 4) increase self esteem, 5) provide conversational and social opportunity." Because this program was not designed as a research project, outcome data are not available; however, the authors reported that spouses and volunteers in the program observed increased verbal behavior and social interaction in the participants. The authors attributed some of this improvement to the fact that the program did not demand verbal interaction, thus creating decreased stress and increased relaxation.

Strauss and Gabaldo reported on the incorporation of HT into the assessment and treatment of an individual who had experienced a traumatic brain injury. According to the authors, the functional level of the patient, based on a measure such as the Ranchos Los Amigos Scale of Cognitive Levels and Expected Behaviors, will determine the complexity of the HT rehabilitation goals and objectives. The authors used HT as a means of exploring social, behavioral, and cognitive capabilities and as a means of encouraging this individual to participate in the rehabilitation efforts, once his level of functioning was determined. They reported that this individual developed valuable work habits and rebuilt self-esteem through this horticultural program. Some examples of the use of HT for augmenting the treatment of cognitive deficits in this individual with traumatic brain injury included following written directions on a package of seeds and following a written checklist indicating daily closing routine for the garden area, with the objective of improving the patient's ability to correctly sequence multistep tasks.

Abbott and colleagues developed an HT program at a Veterans Affairs facility. Their model program uses HT to facilitate sensory stimulation, social interaction and integration, and improved self-esteem for a variety of age groups.

Haas and colleagues described the use of HT for patients with dementia in an extended care facility. Gardening for these patients provides "sensory stimulation and exercise" with emotional and cognitive goals being the primary focus. According to the authors, gardens can provide an area for the treatment activities as well as an area for residents to safely wander. Haas and

colleagues illustrated the use of HT with a case study of an 80-year-old male with early onset of dementia. The patient was enrolled in a day treatment program that offered HT. According to the authors, the goals for HT activities were “(1) to provide sensory and mental stimulation, (2) to provide opportunity for physical exercise in a safe environment, and (3) to facilitate reality orientation.” Through involvement in this program, the patient was observed to become more sociable, more talkative, and less frustrated.

Pentz and Strauss discussed a case example of a 9-year-old student with behavioral and learning difficulties who was aided by the use of HT. The student, who was reportedly hyperactive, impulsive, depressed, and had difficulty following directions, was placed in a “gardening project” group with several other male students with behavioral and learning difficulties. The group members participated in activities such as shopping for seeds and gardening supplies, planting and caring for the plants, and finally taking the plants home and continuing to care for the plants at home. According to Pentz and Strauss, the gardening experience was both enjoyable and calming for this student and resulted in his improved social interaction with peers, decreased anxiety, and improved sense of confidence. He reportedly carried these new skills outside of the treatment session and become an active gardener at home.

All in all, the professional field of HT is a fairly new pursuit but has the potential of being a beneficial augmentative treatment approach for both adults and children. Continued research on the potential benefits of using HT is required before this type of treatment approach may be recommended.

Natural Environment Therapy

Included within the domain of NBT is the practice of exposing patients to natural environments or to any naturally occurring entity. To quote Frumkin, “For the great majority of human existence, human biology has been embedded in the natural environment.” A human's relationship with the natural environment and the idea that this relationship may be related to good health is not a new concept. Of course, our earliest ancestors were in constant contact with nature, and it was not until very recently in human history that people have become isolated from contact with the environment. To compensate for our isolation from the natural environment we attempt to recapture this connection. Examples of nature-reuniting behavior can be observed in the workplace as individuals bring plants to the office; in homes as individuals light fires in indoor fireplaces; in the tropical travels of residents of the northern regions, who wrestle with winter. There is evidence that people tend to prefer natural environments over built environments (e.g., brick buildings, paved walkways). Many investigators attribute this preference to nature's ability to provide restoration from daily stress or attentional fatigue.

The restorative effects of the natural environment have been widely published in the medical and psychological literature. In a frequently cited paper on the healing effects of exposure to the natural environment, Ulrich discussed recovery patterns in cholecystectomy patients exposed to one of two conditions following surgery. Over the 10-year period of this study, 50% of the patients were randomly placed in a surgical recovery bed facing a window with a view of a brick wall. The other 50% were placed randomly in surgical recovery beds facing a window with a

view of a row of deciduous trees. Examination of surgical outcomes of patients showed patients whose beds faced the trees had a statistically significant reduced length of stay and required less pain medication than the patients facing the brick wall.

Moore examined the influence of exposure to natural environments on the well-being of prisoners. The behaviors of prisoners randomly assigned to a cell with a window view of the paved courtyard were compared with behaviors of prisoners randomly assigned to cells with a window view of the countryside. Prisoners with views of the paved courtyard had a higher number of sick call visits to the infirmary as compared with prisoners with a countryside view. The author concluded that exposure to the natural environment may have reduced stress in these inmates and resulted in better health.

Kaplan attempted to provide an explanation for the rejuvenating and renewing effects of the natural environment in his much-cited attention restoration theory (ART). According to ART, in order for people to successfully function in the modern world, they must be able to deliberately direct and focus their attention. This ultimately results in mental fatigue. In contrast to this, nature draws on involuntary attention and thus has the ability to provide a respite from mental fatigue. Several studies support the theory that nature can restore attention.

For example, Laumann and colleagues tested the ART hypothesis in their 2003 study on 28 female undergraduate students. The conditions were to have students (1) complete a proofreading task to induce mental load, (2) perform an attention-orienting task, (3) watch a video of either a natural or urban environment, and (4) perform the attention-orienting task a second time. Heart rate for both groups was measured throughout the tasks. Investigators found that exposure to natural environments versus urban environments elicited a reduction in physiological arousal, and perhaps because of this reduced arousal, “less attentional selectivity.” Subjects exposed to natural environments were better at tasks that required a broad attentional focus (tasks involving the processing of multiple cues rather than simple attention tasks). According to Laumann and associates, the results of this study may increase our understanding of the restorative effects of nature.

In another recent study looking at the restorative effects of the natural environment, van den Berg and colleagues studied the mood and attentional abilities of 106 college students. Each subject was first shown a frightening movie and then shown a video of either a natural environment (i.e., videos of waterfalls) or a built environment (i.e., videos of urban scenes). Mood state was measured before and after the environmental videos and a test of concentration was performed after viewing the environmental videos. Results indicate that viewing the natural environment versus the built environment “elicited a more positive mood and marginally better concentration” in subjects than viewing a video of a built environment.

Taylor and associates looked at ART in children diagnosed with attention deficit disorder (ADD) to determine if nature has a restorative effect on this group of children between 7 and 12 years old. In this study, questionnaires regarding a child's attentional functioning in a variety of settings were sent to the parents of children with a diagnosis of ADD. Approximately 60% of the questionnaires were returned, for a total of 96 completed questionnaires that could be analyzed

for the study. The results of this study indicate that children function “better than usual after activities in green settings and that the ‘greener’ a child's play area, the less severe his or her attention symptoms.” This study supports ART and extends it to a new population.

Although the studies on the effects of the natural environment on affect and cognition are limited, the growing numbers of studies in both the adult and child literature are adding to a body of knowledge regarding the restorative potential of the natural environment on both affect and cognition. Additional studies are required to determine if the use of natural environments in the treatment of communication disorders is beneficial.

FUTURE RESEARCH DIRECTIONS

Studies of NBT indicate that AAT, HT, and natural environment therapy can have positive effects on human behavior and well-being. Few studies, however, have examined the effects of NBT on communication disorders, an area ripe for further well-controlled investigation. Further studies should include:

1. Studies that compare traditional treatment to traditional treatment augmented with an NBT practice.
2. Studies with a clear delineation between goal-directed nature-based activities and non-goal-directed nature-based exposure.
3. Studies that include means of measuring physiological and/or neurological changes (functional magnetic resonance imaging) that may occur with exposure to an NBT.
4. Long-term follow-up studies of patients treated with NBT to determine whether the benefits are sustained over time.

CONCLUDING REMARKS

Nature-based therapies, including AAT, HT, and natural environment therapy, have been incorporated into the practice of many medical professionals. Nebbe pointed out that

Although working with nature or elements of nature may not be a counselor or therapist's chosen adjunct therapeutic mode, it is essential for every counselor and therapist to be aware of the intimate connection between humans and the natural environment. Whether an overt part of therapy, or simply a subtle influence, humans are impacted in many ways their by environment. Nature therapy can be viewed as an adjunct therapy or an awareness of the human condition.”

In order for speech-language pathologists to advance their knowledge regarding the therapeutic application of NBT in treating individuals with communication disorders, studies must be designed which are guided by the methods and results obtained by other disciplines. The results of NBT studies in other disciplines should act as an impetus for speech-language pathologists to systematically study the effects of this type of complementary approach for treating communication disorders.

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