

LINKING NATURE AND HEALTH: IMPLICATIONS FOR THE PHYSICAL THERAPY FIELD

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The Nature and Health Link

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Nature Matters

“The ancient Greeks had a fable of the giant Antaeus, that when he wrestled with Hercules, he was suffocated in the gripe of the hero, but every time he touched his mother earth, his strength was renewed. The fable explains itself of the body and the mind. Man is the broken giant, and in all his weakness he is invigorated by touching his mother earth, that is, by habits of conversation with nature. It is good for the body exhausted by the bad air, and artificial life of cities, to be sent out into the fragrant fields, and there employed in exploring the laws of creation.”

~Ralph Waldo Emerson (Essays: First Series)

Were the Greeks onto something? One might ask what nature could possibly have to do with health. I argue that the role of nature may be an integral part of the healing process that today's health institutions should seriously consider. Nature is often overlooked in the health field, and more specifically the physical therapy field. There is evidence that contact with nature has healing effects both psychologically and physically. When it comes to physical therapy, incorporating nature into the regime may provide added benefits. For example, Casting for Recovery is a program that has incorporated nature into their physical therapy practices to help breast cancer survivors recover from “frozen shoulders”, a side effect of chemotherapy treatment. The program helps women regain mobility in their shoulders by teaching them how to fly fish in the great outdoors. The casting motion is meant to help rehabilitate women who experience severed nerves and frozen muscles that result after a mastectomy. This rehab has an added psychological benefit, in that it gives the women a peaceful place to return to mentally when chemotherapy starts to take a toll. Through immersion in nature, patients find physical healing as well as a place for psychological rejuvenation.

This extra physical and mental boost during the healing process is needed now more than ever. Industrialization and modern society has strained the nature connection that humans have had for thousands of years prior. This strain, coined “solastalgia” by Glenn Albrecht, the Director of the Institute of Sustainability and Technology Policy in Australia, is the “pain experienced when there is recognition that the place where one resides and that one loves is under immediate assault.” This is based on research that shows that physical, social, and psychological breakdowns occur in humans who are deprived of inclusion of natural elements, like trees, in their environment. Researchers at the University of Illinois, found that this lack of connection to nature manifests as decreased civility, increased property crime and aggression, and more litter.

Before further exploring the health and nature link, it is important to establish what is meant by “nature” and our connection to it. It is also important to note that due to human's widespread influence and population growth, we can no longer consider nature to be limited to what is pristine and

untouched. A typical dictionary generally defines nature as a feature of the earth that is not created by humans, but that definition ignores that humans have had an impact on nature. Instead nature can be conceptualized more broadly, referring to anything that has its origins in geological, biological, and weather phenomena, and even after human manipulation, still maintains most of its original and unique qualities. In an orchard, for example, the trees are not created by humans, but they are engineered and grafted in a way to ensure maximum growth. These processes have a heavy human thumbprint on them yet, upon closer examination, it becomes obvious that a biotic community thrives within the confines of the environment this orchard has created. One can find whole communities of insects, grasses, and animal species living alongside these manipulated trees. These environments can still be affected by the water cycle, or natural disasters, and still have an element of wildness about them. Nature can also be found in more unexpected places, like a city. Think of Central Park in New York City. This environment is heavily planned, but it maintains its qualities that make visitors feel as if they are in contact with nature despite the towering concrete buildings surrounding the park. Central Park lets people connect to something natural in an otherwise urban setting. Nature can even be found indoors, like indoor gardens, where plants are subject to the same needs as their wild counterparts. They still need water, sunlight, and nutrients, to grow.

Recently, theories that connect human health to this broad idea of nature have emerged. Richard Louv's idea of the "nature principle" argues that human health, spirit, well-being, and survival cannot be fully realized if people are not connected to nature and the natural world. Therefore, the nature principle proposes that people must reconnect with nature wherever they are or they will suffer a diminished ability to live life to happy, healthy lives. Current research shows that bringing nature into the health fields improves quality of life and decreases healing time, both physically and psychologically. Nature also serves as preventative medicine. By combining the power of modern medicine and the untapped power of nature, humans can be more contented than they ever have been.

Our Psychological Health

Psychological health is tied very closely to our overall health, and nature plays a big part in psychological well-being. Nature has the power to decrease depression, increase mood, and even increase cognitive functioning. For example, people feel less depressed after taking a walk in the park than taking a walk in the mall. The Centre for Environment and Society at the University of Essex, which conducted this study in 2009 with more than 1,800 people, compared people who walked through an indoor shopping center to those who walked in a country park that included lakes, woodlands, and grasslands. Researchers found that compared to indoor walkers, spending time outdoors was related to less depressed feelings, less tension, less confusion, less fatigue, and feeling more vigorous.

In addition to just being outside, even something as simple as exposure to dirt can make us happier. A study in the journal *Neuroscience* found that exposure to dirt may have an effect on elevated mood. A good bacteria found in dirt, called *Mycobacterium vaccae*, leads to increased serotonin levels in the brain. While the exact mechanism is not known, it is hypothesized that the bacteria indirectly affects the brain by causing immune cells to release cytokines, a chemical found in the brain. These cytokines, in turn, activate nerves that relay signals from the body to the brain which then increases serotonin

release. This increase in serotonin triggers increased feelings of happiness. In fact, a lack of serotonin is often linked with depression.

Complete benefits are not simply derived from being outside just anywhere, but specifically from immersion in nature or natural environments. A study conducted at the University of Michigan demonstrated that spending time walking in nature increased cognitive functionality. Participants in the study were told to take a fifty minute walk in either city streets or an arboretum. After the walk, the participants were given a cognitive assessment to evaluate their memory and attention. Those who walked through the arboretum performed 20% better than their city-walking counterparts. They also reported being in a better mood.

Our Physical Health

Nature is not only good for our psychological health, it also has impacts on both the physical and physiological aspects of our health. While something as simple as dirt can make us happier, the sun can make us healthier. Mere exposure to sunlight is a fundamental part of our physical health due to the sun's ability to provide humans with a bulk of the vitamin D needed for optimal health. Vitamin D deficiency is an issue that effects at least half to three quarters of adults and teens in the United States. Vitamin D deficiency can lead to a gamut of health problems that include, but are not limited to arterial stiffness, cancers, type 2 diabetes, decreased lung function for children with asthma, and decreased overall physical strength in young adults. Americans don't have to put themselves at a greater risk for these diseases, the fix is really quite simple because Vitamin D can be attained from sunlight. It has been demonstrated that an increase of Vitamin D has a multitude of health benefits. The sun is beneficial in moderation, and the act of being outdoors and in the sun has long term benefits. These benefits include, lower blood pressure, lower risk of heart attacks, and a lower risk of both multiple sclerosis, and rheumatoid arthritis. Activated vitamin D can even be one of the most potent inhibitors of cancer cell growth according to Dr. Michael F. Holick, PhD, MD, a leader at the Vitamin D, Skin, and Bone Research Laboratory at Boston University School of Medicine.

Sunlight is not hard to come by, it can be found just about anywhere. Additional benefits can be found from adding nature to the equation. According to the Nippon Medical School in Tokyo, stress relief and stronger immunity to illness can result from being in nature. Researchers found that exercising in a natural setting increases the activity of Natural Killer cells, which are vital our ability to ward off illness. This phenomenon is thought to occur as a result of inhaling the air outside, which exposes one to phytoncides (antimicrobial essential wood oils given off by plants) that activate pathways that increase the activity of the Natural Killer cells. This effect can last up to 30 days.

Regaining Our Health

Exposure to nature can aide patients on the road to recovery, after they experience a shock to their system, like surgery. In 2005, research scientists at the University of Pittsburgh found exposure to natural light was correlated with less pain, stress, and pain medications in patients recovering from spinal surgery. Another more well-known study of patients recovering from gall bladder surgery demonstrated that simply viewing nature leads to decreased recovery times. In this study, records of patients were obtained for the years 1972 to 1981. Patients had been in two types of rooms, one set of rooms was overlooking a stand of deciduous trees while the other set overlooked a brown brick wall.

Patients were also matched according to their age, sex, weight, nature of surgery, as well as other factors in an attempt to reduce the likelihood of confounding variables. In other words, researchers controlled for many factors, with the only difference occurring between the rooms that overlooked different scenes. Data showed that patients that overlooked a “natural scene” had a shorter stay after surgery, fewer negative evaluative comments, less doses of strong medicine, and slightly less complication in the healing process.

Limitations of Current Research

Despite promising outcomes, a number of gaps in the literature on the nature-health link exist. There is a need for more advanced research methodology and better research designs if we are to truly comprehend the strength of the connection that exists between nature and health. For example, some of the current studies lack control groups. This makes it difficult to tell how much of the effects came from actually being out in nature as opposed to the existence of other reasonable explanations. Use of self-reported data can lead to other issues such as social desirability bias and problems with recall. This is characteristic of many studies in the nature-health link; there exists a lack of tangible, measurable data to demonstrate the cause-effect relationship.

Although not all the data has been consistent, and a lot of the data is correlative rather than causal, these studies have are headed in a promising direction. In the face of the limitations surrounding the nature-health link, there is still quality research that signifies that a link truly exists. New research is using more rigorous study designs to further solidify the relationship between health and nature. As the link gets stronger, and the data becomes more evident, it begs the question, should physical therapy consider exploring the nature-health link? Regimens that explicitly incorporate nature could possibly help heal patients in more ways than one.

Adopting the Nature-Health Perspective

The integration of nature and human health is not a new idea. The idea of using nature to reach health outcomes has already been adopted in the certified practices of therapeutic recreation, ecotherapy, and green design. However, its current level of adoption in the physical therapy field is present but minimal.

Therapeutic Recreation

Therapeutic Recreation has made a positive impact on patients’ physical outcomes. Just like physical therapy, the aim of therapeutic recreation is to rehabilitate a person to a level where they can function independently, but it is its own field. Therapeutic recreation also aims to decrease or remove any daily limitations that might otherwise exist as a result of a patient’s disability or illness. Recreational therapists seek to connect health and recreation in their practice because of the positive outcomes that come from the benefits of engaging in activities we regularly think of as leisure-time experiences. Therapists use a wide range of techniques and interventions including outdoor recreation to help improve patients emotionally, socially, cognitively, and even physically. Care is given in an individualized manner and therapists, with the help of the patient’s family, take special care to ensure that the

patient's specific interests are incorporated into their regimen. The inclusion of these specific interests as well as community resources, results in optimal outcomes.

The therapeutic recreation field is very broad, and creatively finds ways to advance rehabilitation through diverse techniques. Techniques for rehabilitation include outdoor recreation, sports, dance and movement, animals, and community outings. These activities have a wealth of positive outcomes that include reduced stress, reduced depression and anxiety, increased reasoning ability, recovery of basic motor functions, as well as many other outcomes. A big aim of therapeutic recreation is to integrate patients with the community and teach them how to use community resources and recreational resources to further rehabilitate. In acute health care settings, recreational therapists can be found working in collaboration with physical therapists.

Despite the lack of a specific focus on either nature or physical therapy, the creativity and diversification used in therapeutic recreation can easily be applied to physical therapy. In fact, recreational therapy and physical therapy can go hand in hand. In physical therapy, patients are pushed to increase their strength, flexibility, and stability. As a result, they can safely participate in recreational therapy. By participating in recreational therapy, a patient can find some respite from the demands of physical therapy. This idea has been implemented into therapy camps, such as the one offered at Bradford Woods, a camp affiliated with Indiana University that offers a recreation therapy program. Outdoor settings and natural environments have been found to have a restorative effect on patients at Bradford Woods. Participants engage in therapeutic programs such as canoeing, waterskiing, and scuba diving. The improved health outcomes, according to research by South University, included improvements in cognitive and psychosocial status, physical status, and an improved ability to manage their life.

Although therapeutic recreation incorporates physical therapy and nature-based activities to some extent, it is simply an umbrella term for a number of therapies that occur in a number of recreational settings. At times, therapeutic recreation makes the physical therapy-nature link. It is here, where therapeutic recreation fails to make a thorough link, that physical therapy can intentionally connect physical therapy and nature.

Ecotherapy

Ecotherapy capitalizes on the healing power of nature for both the mind and body. Ecotherapy is more nature based and aims to get patients outside to provide maximum healing psychologically and physically. A topic first written about by Howard Clinebell, ecotherapy has emerged as a result of researchers taking notice of the benefits of contact with nature. Also referred to as "green therapy" or "earth-centered therapy", ecotherapy aims to nurture healing and growth through purposeful interaction with the natural environment. This field recognizes that people are still connected to nature. It is essentially applied ecopsychology and encompasses nature-based methods for psychological and physical rehabilitation. In ecotherapy, patients are encouraged to participate in a wide variety activities tied to nature or the world in its "organic state". Ecotherapists often plan these outdoor activities in a structured manner. These activities include gardening, fishing, or taking a long walk in the country. Ecotherapists act as a liaison between medical personnel and patients to develop treatment plans that ensure a patient is taken care of physically, mentally, and spiritually. They then administer direction on

how patients carry out the treatment. Once the patient starts the treatment, ecotherapists monitor and adjust the treatment for optimal progress.

Similar to therapeutic recreation, ecotherapy does not focus on physical therapy, but many of the underlying goals mirror each other. All three fields want to restore patients to their maximum functioning capacity. Therapeutic Recreation has a more physical focus and incorporates nature at times. Despite the definition, ecotherapy does not include much or any physical therapy. That being said, physical therapy could adopt the ideals of ecotherapy by providing more avenues for contact with nature.

Green Design

One step removed from directly treating patients, green design seeks to move green building into the healthcare system. The goal of green building is to use the power of design to connect to the power of nature. Much of this movement is informed by Ulrich's studies on how views of nature have positive health outcomes. *Biophilia*, a book written by Edward O. Wilson about human affinity for nature and life, has also informed much of environmental design theory. Architects and designers have realized that designs that keep in mind environmental features and attributes lead to overall well-being, as reported by patients. Architects are careful to design spaces that allow sunlight in patients' rooms and provide views to sunny outdoor spaces. Connection to nature is specifically carried out through the use of large windows and outdoor gardens. Inside, nature is simulated through paintings or video projections. Instead of treating the disease, green design aims to create an environment that treats the human as well.

Physical Therapy

As mentioned before, Casting for Recovery highlights the potential for physical-therapy to benefit from our growing awareness of the nature-health connection. Perhaps they have realized that nature has more benefits to health than previously thought. The American Physical Therapy Association's official site reveals that there doesn't seem to be a reflection of this knowledge in the rest of the physical therapy field. Furthermore, personal communication with the APTA Chapter Representative of Virginia revealed that there is nothing like the nature-health link on file when it comes to physical therapy.

Connecting Physical Therapy to Nature

The Greeks were onto something; contact with nature provides a range of benefits from psychological to physical. The science demonstrating this connection is promising but still has a lot of room left to grow. Although some fields have adopted practices that incorporate nature, they have yet to systematically evaluate the outcomes. Is physical therapy missing the boat?

Is it time for physical therapy to get on board and consider adopting this view of a nature-health link? Physical therapy has the opportunity to further explore how deep these benefits permeate. Given the progress other fields have made in exploring this connection, physical therapy can pick up where others

have left off. Additional questions need to be answered, including; is there a physical therapy-nature link to begin with? Evidence suggests that there may well be, but to what degree can it enhance outcomes over and above current practices? For it to be adopted, the benefits of changing practices need to outweigh the cost. When it comes to patient's perspective, the physical therapy field also needs to consider the impact. Will patients buy into the idea, or will they be weary of such a transition? It is imperative that we answer these questions if we are to truly understand the healing power that can be harnessed from nature. These answers could change long standing regimens, policies, and practices. Ulrich's post-gallbladder surgery study shows that strong designs for these types of studies exist and have already impacted billions of dollars in hospital design and construction. There is certainly enough research and nature-centered fields in existence that make it worthwhile to seriously consider incorporating nature into physical therapy. Perhaps it is time for the physical therapy field to put the nature-recovery link on the research agenda. Once the benefits are clearer, physical therapy practices can develop new regimes to reflect this knowledge.

So what would it actually look like to integrate physical therapy with nature? Instead of having patients warm up on a treadmill or bike, we might send them outside for a walk and boost their mood, vitamin D levels, and serotonin. When picking locations to build offices, we can incorporate green design and build these structures facing landscapes rather than a built environment. We can invest in aquariums and houseplants in the office. Roofs can be turned into gardens where patients can wait until it is their turn to be worked on. Instead of encouraging patients to do "take-home" exercises, they can be encouraged to do "take to nature" exercises.

Concluding Remarks

The nature principle claims that reconnecting to nature is fundamental to human well-being, and while it was initially a philosophical statement, the evidence is mounting to support this nature-health link. Although adopted in fields such as therapeutic recreation, ecotherapy, and green design, the physical therapy field has yet to give this nature-health link formal consideration. The Casting for Recovery example is promising but there is little evidence that the physical therapy field has integrated nature into the practice. Perhaps it is time that physical therapy consider a research agenda to explore the link. Once benefits are clearly established and outcomes assessed, the field should then consider the best ways to incorporate nature into practices. After all Louv was correct in pointing out, the beauty in prescribing nature is that the directions are simple, the refills are unlimited, and the prescription never expires.

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