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The Use of Nature as A Treatment Modality
in Occupational Therapy
Lauren Koch
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The Use of Nature as A Treatment Modality in Occupational Therapy

Abstract

Nature is inherently therapeutic. Applying the principles of occupational therapy within the natural environment integrates the physical, mental, and socio-emotional health benefits afforded by nature into therapeutic intervention practices. The nature centered context of the outdoors addresses performance skills and patterns, highlighting its use as a therapeutic modality. As such, nature may be used as an effective treatment modality in the practice of occupational therapy due to the benefits that it affords. The incorporation of nature into therapeutic intervention may be based upon the environmental factors, available resources, and function of the natural environment. The goal of this literature review and activity analysis is to determine that nature-based occupations and activities may be used to enhance address and performance skills including motor skill development, sensory functioning, mental functioning, and social skill development. Additionally, this paper aims to educate on the potential for the use of nature in occupational therapy and to provide a resource to being the incorporation of nature into practice.

The Use of Nature as A Treatment Modality in Occupational Therapy

Introduction

Nature offers a unique, positive opportunity for therapeutic intervention, especially in the field of occupational therapy. Included in this thesis is a review of the literature regarding the benefits of nature for promoting general health and wellness and as a therapeutic tool for those that are unwell. A comprehensive analysis of the benefits of nature examines the developmental occupational enrichment afforded by the outdoor environment. The findings of the literature review and analysis determine that nature may be effectively used as a treatment modality in occupational therapy. These findings are further incorporated into guidelines for application into occupational therapy practice and examples of nature based therapeutic activities that may be brought into practice.

Literature Review

Nature is defined as the physical world and the phenomena associated with it. This includes the natural environment and the elements within it including plants, animals, the natural landscape, and other features of the earth not created by humans (Nature, n.d). Nature may also be referred to as the outdoors, the out of doors, the natural environment, or wilderness. Interaction with or the experience of nature may be classified as an intentional experience, incidental occurrence, or indirect interaction. An intentional nature-based experience or activity entails active participation and engagement. Incidental occurrences include contact with nature through related experiences, such as time spent in green spaces. Indirect interaction with nature is the unplanned or unintentional experience of nature such as viewing nature through images or by proximity to a natural area (Keniger, Gaston, Irvine, & Fuller, 2013). Interaction with nature has the potential to influence positive health and wellness outcomes.

Health Benefits of Nature. To effectively incorporate nature into healthcare, it is necessary to first examine how interaction with nature influences an individual's health and wellness. It has been suggested that engagement with nature increases the psychological and physical wellness of both children and adults (Twohig-Bennett & Jones, 2018). The experience of nature, both intentionally and incidentally, influences emotional and cognitive health and wellbeing. Intentional engagement in nature through activities such as gardening is linked to decreased stress responses and increased mood (van den Berg & Custers, 2011). Active engagement with nature has also been linked to positive socioemotional wellness. For instance, self-reported participation in outdoor recreation activities is associated with perceived emotional well-being (Korpela, Borodulin, Neuvonen, Paronen, & Tyrväinen, 2014). Time spent in nature is may influence cognitive stimulation. Cognitive stimulation through engagement with the outdoor environment is correlated with increased attention and decreased attentional fatigue. These properties of nature also for natural restoration of attention. The varied, discrete stimulation of nature restores attention and facilitates relaxation as demonstrated in Attention Restoration Theory (ART) (Berman, Jonides, & Kaplan, 2008; Cimprich & Ronis, 2003). Interaction with nature has also been linked to various physical changes that positively impact health. Research has shown that exposure to natural environments leads to increased physical energy and vitality (Bowler, Buyung-Ali, Knight, & Pullin, 2010; Ryan et al., 2010). Spending time in a natural environment also affects bodily processes. It was found that the concentration of cortisol, blood pressure, and heart rate decreased following time spent in a natural forest setting as compared to an urban setting (Park et al., 2009). Additionally, for older adults living in a community environment, high frequency of going outdoors was correlated with an increase in physical functional status over time (Fujita, Fujiwara, Chaves, Motohashi, & Shinkai, 2006).

Including Nature in Healthcare. The outdoor environment and interaction with nature has been regarded as beneficial to health and is correlated with positive health outcomes (Twohig-Bennett & Jones, 2018). This evidence has led to an increase in the use of nature in the healthcare industry. The promotion of nature as an influence on health may be seen in the ‘greening’ of healthcare, using the landscape as a passive therapeutic aspect, as active engagement with nature through therapeutic activities, or use of the natural environment for health promotion and wellness related care.

Nature may be effectively utilized as rehabilitation for individuals experiencing non-optimal psychological and physical health. The outdoor environment decreases symptoms associated with depression. The participation of activities in the outdoor environment is correlated with decreased anxiety, anger, fatigue, and sadness (Bowler, Buyung-Ali, Knight, & Pullin, 2010). Additionally, nature has been correlated with increased mood and short-term memory in individuals with depression (Berman, Kross, Krpan, Askren, Burson, Deldin, . . . Jonides, 2012). In populations with attentional challenges, the experience of nature has been associated with increased attention for individuals with developmental disabilities. Experience of green outdoor activities decreased report of symptoms associated with attention-deficit hyperactivity disorder (ADHD) including difficulty staying focused and completing tasks, difficulty listening and following directions, and difficulty resisting distractions (Kuo & Faber Taylor, 2004). Additionally, time spent outdoors on a farm or walking in a park has been correlated with increased concentration in children diagnosed with ADHD (van den Berg & van den Berg, 2011; Taylor & Kuo, 2009).

Natural spaces are increasingly used in healthcare to promote the health and wellbeing of patients. Therapeutic gardens are intentionally designed garden spaces that promote access to

and engagement in nature for the purpose of positive health outcomes. A therapeutic garden includes modified features for increased accessibility, an abundance of plants and interaction with plants, and universal design elements (Hazen, 2014). Hospitals, healthcare facilities, schools, and nursing homes are installing a variety of therapeutic garden types, including healing gardens, sensory gardens, and gardens designed for a specific user group such as individuals with dementia or autism spectrum disorder (ASD). According to Reeve, Neiberler-Walker, and Desha (2017), healing gardens are nature-oriented spaces that are designed to provide therapeutic or rehabilitative potential. Within the context of therapeutic gardens, sensory gardens use the garden environment to offer sensory enrichment using textures, colors, scents, and sounds, and to encourage physical mobility and social skills (Hussein, 2010). Significant research exists in the use of therapeutic gardening as a treatment modality. Therapeutic gardening may be used as a treatment mechanism through the use of therapeutic horticulture where horticulture is used as a treatment modality to reach therapeutic goals. Alternatively, horticulture therapy incorporates horticulture related activities into therapeutic intervention to promote the health and well-being of individuals with physical or psychological disability or dysfunction (Sempik, 2010). The therapeutic value of gardens and horticultural activities is known to have significant benefits on the health and well-being of people, as well as therapy specific values including transferability, variation, and adaptation (Söderback, Söderström, & Schäländer, 2004).

Use of nature in the context of therapeutic outcomes is defined as nature-assisted therapy (NAT). Nature assisted therapy involves the use of nature as a treatment mechanism to promote recovery and rehabilitation through involvement of the natural world or aspects of nature as the primary treatment modality (Annerstedt & Währbord, 2011). Nature therapy or eco-therapy includes the use of nature as a therapeutic partner in psychotherapy. This particular type of

therapy incorporates art and drama therapy, Gestalt, narrative, eco-psychology, transpersonal psychology, adventure therapy, shamanism, and mind-body practices based upon connection to the environment, incorporation of nature into rituals, and connection to self for an experiential therapeutic process (Berger, 2010). Outdoor experiences and adventures are also used as a treatment modality in psychological rehabilitation. Adventure therapy is mental health intervention focused on adventure experiences, often in natural environments, for cognitive, affective, and behavioral engagement (Gass, Gillis, & Russell, 2012). Wilderness therapy is a type of nature-assisted therapy that combines psychological therapeutic intervention with outdoor modalities as a mental health treatment (Rutko & Gillespie, 2013).

The outdoor environment has also been increasingly used as a treatment environment and modality among non-healthcare based professions such as therapeutic recreation. There are increased health initiatives to get people outdoors in order for them to experience the benefits of nature. Outdoor and therapeutic recreation focuses on engagement and participation in outdoor leisure activities such as hiking, fishing, rock climbing, camping, and kayaking, etc.

Including Nature in Occupational Therapy Practice. As defined by the *Occupational Therapy Practice Framework*, occupations are purposeful, meaningful, useful daily life activities that people engage in (AOTA, 2014). Various contexts, client factors, performance skills, and performance patterns influence how the occupations are performed. Occupations may be classified as activities of daily living (ADLs), instrumental activities of daily living (IADLs), rest and sleep, education, work, play, leisure, and social participation (AOTA, 2014). Overlaid with the concept of occupations, the person-environment-occupation-performance model postulates that there is a continuous interaction of the person, environment, occupation, and an individual's performance of daily occupation (Law et al., 1996).

The physical environment is a critical context in occupational therapy intervention, as it influences patient engagement in occupations by promoting engagement and participation (AOTA, 2014). The physical environment may support or hinder their engagement in occupations. While the framework of occupational therapy supports intervention provided in a natural environment, occupational therapy intervention most often occurs in gymnasium-like indoor environments or hospital settings using man-made intervention tools. The environment in which therapy is provided influences the type of therapeutic intervention that is used by therapists (Skubik-Peplaski, Howell, & Hunter, 2016). Therapy gyms are often full of bright, plastic materials and fluorescent lights that do not resemble the natural environment or environment where the skills being practiced will be used. These environments are loud, overstimulating, and unnatural for those receiving therapy services. These artificial indoor environments do not accurately reflect a person's actual living environment, therefore limiting their opportunity to naturally engage in occupations.

The benefit of interaction with nature as a therapeutic activity can be traced back to the early days of occupational therapy as a healthcare profession. Clarke (1950) recognized gardening as an effective intervention for children and individuals with physical handicaps, blindness, or mental illness, as it could be graded based upon skill or developmental level. Nature continues to allow for a unique opportunity and environment to provide therapeutic treatment and activities for individuals receiving occupational therapy services. There are several theories that support the need for engagement with nature in the context of environment and occupational engagement. Wagenfeld (2013) describes the person-environment-occupation-model in the formation of The Occupational Participation and Engagement with Nature Model. This model suggests that individuals are naturally drawn to nature and in turn engage and

connect with nature through various occupational components which are influenced by the design of the environment. This theory is supported by the concept of biophilia. According to Wilson (1984), humans possess a natural desire to interact with nature and the environment. The experience of nature is inherently meaningful to many individuals. A study completed by Wagenfeld and Atchison (2014) found that occupational therapy practitioners frequently utilize gardening as a therapeutic intervention as it is meaningful, purposeful, and intrinsically motivating for clients. Using a natural environment for occupational therapy intervention offers the opportunity to practice skills and participate in occupations as one would in everyday life. Occupational engagement in nature occurs through engagement in play and leisure pursuits that combine the nature as both the environment and as the tools used or as a therapeutic setting and mechanism in which nature is used to aid in the therapeutic process. Play is spontaneous or organized activity providing enjoyment, entertainment, amusement, or diversion. Leisure is engagement in an intrinsically motivated non-obligatory activity (Parham & Fazio, 1997 in AOTA, 2014). Within this, the use of nature in occupational therapy intervention may provide secondary benefits to other areas of occupation including basic activities of daily living (BADLs) as fundamental skills for survival and wellbeing such as, bathing, toileting, dressing, eating, personal hygiene and grooming. Additionally, more complex interactions may be addressed through IADLs through the care of others, care of pets, child rearing, communication management, driving and community mobility, financial management, health management and maintenance, and home establishment and management and social participation (AOTA, 2014). Angela Hanscom, an occupational therapist and founder of *Timbernook*, an outdoor occupational therapy camp for children, states that many activities that are done indoors may be brought outdoors (Hanscom, 2016). This reconceptualization of where intervention can take place

promotes meaningful activity and engagement in a dynamic natural setting. Both the environmental setting and the opportunity to engage with nature offer a variety of health benefits that may ultimately positively influence the outcome of occupational therapy intervention. Despite this evidence, nature is currently used minimally in healthcare and occupational therapy. Nature as a therapeutic modality is considered to be a ‘niche’ area has not been widely utilized in healthcare. Yet, nature is beneficial to both health and developmental related outcomes.

An Analysis of Nature as a Tool for Developmental Enrichment

Nature as a whole may be used to influence client factors and to address a client’s performance skills and engagement in occupations. Performance skills are observable elements of action and capacities that have an implicit functional purpose and influence the ability to engage in occupations and activities. Performance skills are classified as motor skills, process skills, and mental functioning. Capacities addressed encompass body functions, including mental functions, sensory functions, muscle functions, and movement functions. These capacities converge with structures and environmental contexts to emerge as performance skills. (AOTA, 2014). As such, and as described above, nature and natural elements may be effectively facilitated as a treatment modality to address occupational performance and performance skills.

Motor Skill Development. Motor skills are performance skills focused on interaction with the environment and objects within the environment (Boyt Schell, Gillen, & Scaffa, 2014 in AOTA, 2014). The outdoor environment affords various opportunities for gross motor skill development through locomotion and stability-based movement. Active engagement in the environment promotes large motor movements through climbing, jumping, running, leaping, sliding, walking, balancing, bending, stretching, and turning (Lim, Donovan, Haper, & Naylor, 2017). Unstructured play in an outdoor environment increased children’s balance and

coordination when compared to unstructured play in a playground setting (Fjørtoft, 2004). Increased motor functioning including balance, kinesthesia, posture, muscle tone, and visual motor integration is associated with a higher rate of social play in the outdoors (Bar-Haim & Bart, 2006). For instance, while engaged in play in the outdoor environment, children ages 3 to 5 were observed using a variety of motor skills. Play included climbing on both man-made and natural structures, running during games or as a means of movement from place to place, jumping and hopping during activities, and throwing and kicking objects during games (Ceciliani & Bortolotti, 2013). Participation in these motor skills helps to develop and enhance balance, bilateral coordination, body awareness, hand-eye coordination, foot-eye coordination, muscle tone, muscle strength, muscle endurance, and posture. Engagement with the outdoor environment also improves fine motor skills. Use of the hand to interact with physical aspects of nature promotes fine motor skills through the use of reach, grasp, manipulation, and object control skills. Gardening requires proper alignment, stabilization, and positioning to ensure that an individual is effectively maintaining balance and completing necessary tasks associated with gardening including watering, pruning, and planting. Building a fort using logs, sticks, leaves, and rope incorporates grip, manipulation, and coordination skills while creating gathering the materials for the fort encourages bending, lifting, moving, and transporting skills. Digging in soil, climbing a tree, and handling of plants and other natural materials allow for practice of fine motor skills in nature, as well as practicing of bilateral coordination skills.

Sensory Functioning. Coming into contact with nature in an outdoor environment is a multisensory experience. The outdoor environment naturally offers various opportunities for sensory input through auditory, tactile, visual, olfactory, proprioceptive, and vestibular stimulation, in addition to the processing and integration of these skills. Auditory stimulation is

experienced through the sound of the natural environment with water, wind, and wild animals providing auditory input. Auditory discrimination is required in order to decipher bird calls. Additionally, sound as a sense may be experienced as individual elements or as a collection of auditory input, using selective attention to process each sound. Nature offers opportunity for tactile input through engagement with natural elements such as vegetation, water features, rocks, soil, sand, mud, and the experience of weather. Numerous opportunities for visual stimulation exist in the outdoor environment through the viewing of natural elements. Visual processing must occur in order to accurately respond to and interact with environmental details. Navigation in an outdoor environment requires visual perception skills such as depth perception in order to move about the environment. Interaction and navigation through the natural environment address proprioception and vestibular body awareness. Climbing over a log or rolling a rock provides deep proprioceptive input to the muscles and joints while climbing a tree or rolling down a hill allows for input to the vestibular system. The olfactory system receives input through the smells of the natural environment. A study by Weber and Heuberger (2008) found that in a natural outdoor setting, natural odors derived from plants led to an increase in calmness, alertness, and mood.

The dynamic nature of nature allows for a diversity of sensory experiences. There is variety in the texture, shape, color, size, sound, and smell of each element. The natural environment allows for the experience and integration of simultaneous multiple sensations. Due to the multisensory aspect of the natural environment, nature may be used as a successful avenue for sensory diet play for children with attention-deficit hyperactivity disorder (ADHD) (Sahoo and Senapati, 2014). An indoor treatment environment allows for segmentation of sensory experiences. Hanscom (2016) suggests that building a sand castle in nature offers a different

sensory experience than using a sensory bin filled with sand indoors. While in the outdoor environment, an individual must modulate tactile sensory input from dry sand, wet sand, and other natural features such as rocks and seaweed. Additional features of blowing wind and splashing water allow for more tactile and auditory input, while the process of moving the sand provides proprioceptive input. Comparatively, the use of an indoor sensory sand bin focuses primarily on tactile processing. This type of indoor intervention modality is highly contrived and regulated. Additionally, nature requires continual modulation of sensory input. The novelty of the changing environment, experiences, and challenges requires alteration and modification to an individual's arousal, therefore leading to further processing of sensory stimuli.

Mental Functioning. The outdoor environment encourages the use of specific mental functions and promotes the development of process skills. As nature is not a controlled environment, the stimulation that occurs is unpredictable. Within this, the process of executive functioning is addressed. Interaction with the outdoor environment is a novel experience that requires a variety of processing skills. Interaction with nature encourages the use of higher-order problem-solving skills including insight, problem-solving, and creative reasoning (Atchley, Strayer, & Atchley, 2012). Experiencing nature may impact attention, including sustained and divided attention. Based on attentional restoration theory, the natural environment is an engaging treatment environment while allowing an individual to direct their attention as chosen, which differs from the forced attention of urban or unnatural environments (Berman, Jonides, & Kaplan, 2008; Tennessen & Cimprich, 1995). Additionally, working memory is influenced by the outdoor environment. Memory of tasks may also be improved by time spent in nature (Berman, Jonides, & Kaplan 2008; Berman et al., 2012).

Social Interaction Skill Development. Social skills are socio-emotional and behavioral skills that are utilized in social exchanges. Activities that occur in the outdoor environment provide an opportunity for social skill development. Socio-emotional skills are crucial for behavioral regulation, interaction with others, and relationship development. The natural environment and nature offer opportunities and motivates one to engage in a variety of outdoor activities. Participation in gardening-based activities is associated with increased engagement including increased activity and affect leading to decreased time spent unengaged in individuals with dementia (Gigliotti & Jarrott, 2005). Additionally, engagement in activities that take place in nature leads to increased interaction with others. Research found a higher frequency of social play outdoors when compared to an indoor classroom environment (Bar-Haim & Bart, 2006). Group engagement in outdoor based occupations also allows for social engagement and inclusion, thereby increasing sense of belonging within a group. Group work in an outdoor environment promotes collaboration and team skills, areas that are not easily replicated in an indoor environment. For example, following engagement in therapeutic horticulture, individuals with learning disabilities and mental health problems were seen to have increased social interaction with others (Sempik, Rickhuss, & Beeston, 2014). Experience of the beauty of an outdoor environment has also been linked to pro-sociality through behaviors that benefit others (Zhang, Piff, Iyer, Koleva, & Keltner, 2014). Increased engagement with others, a sense of belonging, and prosocial behavior may positively influence the formation or growth of relationships.

Considerations in using Nature as a Treatment Modality: Implications for Practice

While there is evidence that nature may be used as an effective treatment modality, there are barriers that may affect its use or incorporation into a treatment setting. The outcome of

therapeutic intervention may be strongly influenced by an individual's interest in, connection, or access to nature. Individual client factors influence the way in which nature may be incorporated into treatment. The capacities, characteristics, and beliefs of an individual influence their engagement in occupations (AOTA, 2014). A lack of value, spiritual connection, or meaning drawn from nature may impact the utilization of nature as a treatment modality in occupational therapy. Lack of value and meaning in nature is becoming increasingly more common. Louv (2008) states that there has been a loss of connection between people and nature leading to what he coins as “nature deficit disorder”. This nature deficit has been influenced by an onslaught of concerns about the dangers and risks of the natural environment, concerns on child safety by parents and officials, fear, and increasing urbanization of natural spaces (Gelsthorpe, 2017). A lack of connection relates to a lack of meaning drawn from the natural environment.

Occupational therapy as a whole must be meaningful to the client in some way. While nature can be inherently meaningful for many individuals, not everyone shares the biophilic inclination towards the natural world. The benefit that nature affords and the restorative nature of the environment as a therapeutic aspect are impacted by an individual’s connection and fondness toward nature (Berto, Barbeiro, Barbeiro, & Senes, 2018). Based on personal experience and feelings of connection, the meaningfulness of nature as a treatment modality is variable. As such, it is necessary to understand an individual’s personal connection to the natural world in order to determine the meaningfulness of nature in their lives. In this way, the functionality of the natural environment depends on the individual’s connection to the environment.

Access to nature is also impacted by the individual limitations in body function and structures as well as the overall accessibility of the natural environment. Parents of children with autism spectrum disorder (ASD) cite safety issues, including locomotor challenges and

possibility of elopement and wandering, in limiting access to the outdoor environment (Li, Larson, Yang, Wang, Zhai, & Sullivan, 2019). Personal beliefs and avoidance of the experience of nature may be seen in anxiety about interaction with nature, a lack of control, and trouble modulating the environment. Additionally, attitude and individual self-efficacy led to ability, fear of falling, disorientation, impacted individuals with Parkinson's Disease participation in walking activities outdoors (Outermans, Pool, van de Port, Bakers, & Wittink, 2016). Additionally, limitations in occupational therapy practice settings impact the ability to utilize nature as a treatment modality. The physical location of the therapeutic setting in relation to nature and a natural setting and limitations in resources, necessary skills, and equipment influence how nature may be used. Despite these challenges, occupational therapists have a unique skill set that can help to bridge the gap of connection to, access to, and accessibility of nature.

Nature as a Modality for Occupational Therapy Practice Guidelines

The outdoor environment allows for a great degree of variation and creativity as to how nature may be utilized in a treatment session. Different activities in different environments can provide a diverse range of therapeutic outcomes dependent upon the goal and purpose of each therapy session. There are a number of ways to engage with nature, both actively and passively based upon client factors, skills, goals, and preferences. Nature may be passively incorporated into a treatment session through indirect and incidental experiences. Passive activities refer to therapeutic interventions that occur in a nature-based environment. Preparatory activities, purposeful activities, and occupation-based activities are typically completed indoors may be brought outside to allow for the multiple wellness and personal benefits of nature to be experienced while completing a therapeutic activity. Active engagement involves active participation and engagement with outdoor elements in an intentional manner. Active

engagement with nature may incorporate outdoor elements into a treatment session using natural materials and activities to complete preparatory activities, purposeful activities, and occupation-based activities.

“Appendix A”; Nature Based Occupations, provides a sample guideline to support the performance patterns and skills of occupational therapy patients. These guidelines offer sample performance skills, patterns, and contexts that may be addressed through various outdoor activities, therefore highlighting their use in occupational therapy practice. These guidelines are not exhaustive and list only a fraction of outdoor activities that may be used as therapeutic intervention. Included in this treatment guide are nature-based leisure and play activities that require minimal materials, equipment, or set-up. There are a number of outdoor recreation and leisure activities that may offer great therapeutic benefit, however, based upon constraints set forth by the environment and parts of therapy, many of these activities are not feasible for incorporation into a therapy practice. Examples of these outdoor recreational leisure activities such as fishing, swimming, rock climbing, camping, sailing, surfing, skiing, kayaking, and canoeing. This guide provides suggestions as to how some outdoor activities may be used in practice. The application to practice should be individualized and based upon the needs and wants of the client.

Conclusion

Nature is an effective choice of treatment modality in occupational therapy due to its positive impact on client factors, skills, and occupational engagement while addressing a variety of performance patterns and contexts. The use of nature as a treatment modality affects motor functioning, sensory functioning, mental functioning, and social interaction skill development positively. Additionally, engagement in therapeutic activities in the outdoor setting allows for

functional and client centered intervention in a dynamic, natural environment. Research suggests that nature may also have physical, mental, and emotional benefits which in turn influence intervention outcomes. There are a variety of therapeutic activities that may occur in nature including hiking, bird watching, gardening, and creative play. These treatment activities and the performances addressed may also be generalized and adapted to different outdoor activities and diagnoses. As such, nature can be effectively used as a tool in occupational therapy. Despite the recognition that nature is beneficial for the health and wellbeing for all types of individuals, the understanding of the impact that nature may have on therapeutic intervention in occupational therapy is based on weak anecdotal evidence. This highlights the need for further research to examine the impact that nature as a treatment modality has on the outcome of occupational therapy treatment.

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Appendix A

Nature Based Occupations

Treatment Activity	Performance Skills	Performance Patterns/Contexts
Walking/Hiking	<ul style="list-style-type: none"> • Motor development <ul style="list-style-type: none"> ○ Balance ○ Muscle strength/endurance • Sensory processing <ul style="list-style-type: none"> ○ Vestibular ○ Proprioceptive ○ Visual ○ Auditory ○ Olfactory ○ Tactile • Cognitive functioning <ul style="list-style-type: none"> ○ Planning ○ Problem solving • Socioemotional development <ul style="list-style-type: none"> ○ Behavioral regulation 	<ul style="list-style-type: none"> • Navigation of terrain <ul style="list-style-type: none"> ○ Climbing over/under natural features ○ Hiking uphill/downhill ○ Surface features (grass, dirt, mud, sand, gravel, water, shade, shadows, reflection movement) • Navigation of environment <ul style="list-style-type: none"> ○ Map skills ○ Following signage

Treatment Activity	Performance Skills	Performance Patterns/Contexts
Bird Watching	<ul style="list-style-type: none">• Sensory processing<ul style="list-style-type: none">○ Auditory○ Visual• Cognitive functioning<ul style="list-style-type: none">○ Attention○ Memory	<ul style="list-style-type: none">• Animal viewing<ul style="list-style-type: none">○ Tracking• Animal identification<ul style="list-style-type: none">○ Bird calls○ Species discrimination

Treatment Activity	Performance Skills	Performance Patterns/Contexts
Gardening	<ul style="list-style-type: none"> • Motor development <ul style="list-style-type: none"> ○ Bilateral coordination ○ Hand eye coordination ○ Muscle strength/endurance ○ Grasp ○ Object control/manipulation • Sensory processing <ul style="list-style-type: none"> ○ Vestibular ○ Proprioceptive ○ Visual ○ Gustatory ○ Olfactory ○ Tactile • Cognitive functioning <ul style="list-style-type: none"> ○ Planning ○ Problem solving ○ Attention • Socioemotional development <ul style="list-style-type: none"> ○ Peer engagement ○ Behavioral regulation 	<ul style="list-style-type: none"> • Maintenance <ul style="list-style-type: none"> ○ Watering ○ Pruning ○ Trimming ○ Deadheading • Planting/repotting <ul style="list-style-type: none"> ○ Seedlings ○ Seeds • Harvesting <ul style="list-style-type: none"> ○ Produce ○ Flowers

Treatment Activity	Performance Skills	Performance Patterns/Contexts
Fort Building	<ul style="list-style-type: none"> • Motor development <ul style="list-style-type: none"> ○ Bilateral coordination ○ Hand eye coordination ○ Muscle strength/endurance ○ Grasp ○ Object control/manipulation • Sensory processing <ul style="list-style-type: none"> ○ Vestibular ○ Proprioceptive ○ Visual ○ Tactile • Cognitive functioning <ul style="list-style-type: none"> ○ Sequencing ○ Planning ○ Problem solving ○ Attention • Socioemotional development <ul style="list-style-type: none"> ○ Peer engagement ○ Behavioral regulation 	<ul style="list-style-type: none"> • Planning/design of fort <ul style="list-style-type: none"> ○ Location ○ Material gathering • Construction of fort structure <ul style="list-style-type: none"> ○ Moving of materials ○ Securing materials

Treatment Activity	Performance Skills	Performance Patterns/Contexts
Tree Climbing	<ul style="list-style-type: none"> • Motor development <ul style="list-style-type: none"> ○ Bilateral coordination ○ Hand eye coordination ○ Muscle strength/endurance ○ Grasp • Sensory processing <ul style="list-style-type: none"> ○ Vestibular ○ Proprioceptive ○ Visual ○ Tactile • Cognitive functioning <ul style="list-style-type: none"> ○ Planning ○ Problem solving ○ Attention 	<ul style="list-style-type: none"> • Locating appropriate tree <ul style="list-style-type: none"> ○ Sturdy ○ Alive ○ Height ○ Branches • Ascending the tree <ul style="list-style-type: none"> ○ Pulling up ○ Leg swing • Hanging from branches • Descending the tree <ul style="list-style-type: none"> ○ Lowering

Treatment Activity	Performance Skills	Performance Patterns/Contexts
Insect Catching	<ul style="list-style-type: none"> • Motor development <ul style="list-style-type: none"> ○ Bilateral coordination ○ Hand eye coordination ○ Grasp ○ Motor planning ○ Visual motor • Sensory processing <ul style="list-style-type: none"> ○ Tactile ○ Visual • Cognitive functioning <ul style="list-style-type: none"> ○ Planning ○ Attention 	<ul style="list-style-type: none"> • Locating insects <ul style="list-style-type: none"> ○ Rolling logs ○ Lifting rocks ○ Examining plants • Catching bugs <ul style="list-style-type: none"> ○ Using hands ○ Butterfly nets ○ Using jars

Treatment Activity	Performance Skills	Performance Patterns/Contexts
<p>Loose Parts Creative Play</p>	<ul style="list-style-type: none"> • Motor development <ul style="list-style-type: none"> ○ Bilateral coordination ○ Hand eye coordination ○ Grasp ○ Object control/manipulation ○ Motor planning • Sensory processing <ul style="list-style-type: none"> ○ Proprioceptive ○ Tactile • Cognitive functioning <ul style="list-style-type: none"> ○ Planning ○ Attention • Socioemotional development <ul style="list-style-type: none"> ○ Peer engagement ○ Behavioral regulation 	<ul style="list-style-type: none"> • Materials <ul style="list-style-type: none"> ○ Water ○ Sand ○ Soil ○ Sticks ○ Branches ○ Logs ○ Grass ○ Moss ○ Leaves ○ Plants ○ Pinecones ○ Pine needles ○ Seeds ○ Shells ○ Tree bark ○ Feathers ○ Rocks ○ Pebbles ○ Stones