

Fit. Green. Happy.™:

Exploring How Exercise and the Outdoors Contribute to Mental Well-Being

Litaya Dryja, Alex Sharp, & Hannah Raines

Mountain Challenge

Happiness and Physical Fitness

Litaya Dryja

Throughout our years in public educational institutions, health classes, and healthcare agencies, we are told that physical fitness is a key factor that contributes to a long and healthy life. Specifically, the Center for Disease Control reports that regular physical activity can help “control your weight, reduce the risk of cardiovascular disease, reduce the risk of type 2 diabetes, reduce the risk of certain cancers, strengthen bones and muscles, and increase your chances of living longer” (“Physical Activity,” 2016). The physical health benefits of regular exercise have been long established, but less research has been conducted on its mental health benefits. Many researchers have concluded that regular physical activity can sharpen your thinking, learning, and judgment skills. In addition to these cognitive benefits, regular physical exercise offers extensive mental health benefits such as a decreased risk for depression and better sleep (“Physical Activity,” 2016).

A study conducted by Lindwall, Ljung, Hadzibajramovic, and Jonsdottir (2012) sought to examine the relation between physical activity, aerobic fitness, and mental health. Their data was collected through voluntary subjects who self-reported their physical activity. The team measured symptoms of anxiety and depression in accordance with the Hospital Anxiety and Depression scale as well as the Shirom-Melamed Burnout Questionnaire to evaluate symptoms of burnout. The three-month study included 177 subjects that reported the details of their leisure-time physical activity. After the team collected and analyzed their data they found that self-reported physical activity, but not aerobic fitness, was significantly related to self-reported symptoms of depression, anxiety, and burnout (Lindwall, 2012). More specifically, the study found that higher self-reported physical activity is associated with lower total depression scores. Though the findings are significant, the team addresses some limitations with their study. First,

the study was cross-sectional so causality could not be proved. Additionally, the sample mostly consisted of people that are married and/or a product of advanced education. Also, self-reported instruments of physical activity are generally considered unreliable. Despite these limitations, the team concluded that physical activity and aerobic fitness may relate differently to mental health.

To combat the unreliability self-reported data offered, Hamer and Stamatakis (2010) constructed and implemented a study that sought to examine a potential association between objectively assessed physical fitness and subjective wellbeing. The study's 921 participants were asked to wear a uni-axial accelerometer that recorded movements during waking hours. The accelerometer measured the details of the participants' movements such as the duration, intensity, and the frequency of their physical activity. Measurements taken from the accelerometer were then classified into one of four categories: sedentary, light, moderate, and vigorous. With regard to subjective wellbeing, they assessed mental health through the 12-item version of the General Health Questionnaire (Hamer, 2010). In order to increase the accuracy of their results, the team excluded participants older than 74 years of age, pregnant, taking beta blockers, have a history of fainting, and any other medical conditions that would interfere with their physical performance. Ultimately, the team found that "self-reported, but not objectively assessed moderate to vigorous physical activity, was associated with psychological health" (p. 67). They believe that their selection criteria consisting of healthier and more physically activity subjects prevented them from observing a greater impact on subjective wellbeing.

To further explore depression's association with physical activity, Teychenne, Ball, and Salmon (2008) conducted a literature review to examine dosages of physical activity, domain of the activity, and symptoms of depression in adults were all investigated to determine an association. In their review the team categorized physical activity dosages by frequency,

intensity, and duration in an attempt to identify the optimal dose, domain, and setting of physical activity to reduce the likelihood of depression in adults. Despite inconsistencies between the studies, the team concluded that their review found an inverse association between physical activity and the likelihood of depression (Teychenne, 2008).

In a longitudinal study of older adult Finnish men and women, Lampinen, Heikkinen, and Ruoppila (2000) found that “age-related decrease in the intensity of physical exercise increases the risk of depressive symptoms among older adults” after controlling for health status, socioeconomic status, and physical functioning (p. 371). The team found these results when surveying a population of 663 both at baseline in 1988 and at a follow-up in 1996. The subjects were assessed using a modified version of Beck’s 13-item depression scale and were surveyed about the intensity and frequency of their physical activity using a 7-point Likert-type scale for three categories: necessary chores, regular walking, and strenuous physical exercise. They found that “those who reported a reduction in the intensity of their daily physical activity over the follow-up period reported more depressive symptoms than those who remained active or increased physical activity” (Phillips et al., 2003, p. 142). Ultimately, the team concluded that their sample could have skewed their findings since it included almost twice as many women than men.

Another study that reported positive effects of physical activity in older adults was conducted by Blumenthal et al. (1999). They randomly assigned 156 older adults ages 50 years old and up with major depressive disorder to one of three programs. The programs included aerobic exercise, antidepressant treatment, or a combination of the two. Measurements were taken pre- and post-intervention using the DSM-IV, the Hamilton Rating Scale for Depression, and the Beck Depression Inventory. The authors found that after 16 weeks of treatment all

groups improved in their depression scores. However, they did not find any significant differences in the results of the groups. Though the study did not incorporate a control group that did not receive treatment of any kind, the authors claim that “an exercise training program may be considered an alternative to antidepressants for treatment of depression in older adults” (p. 2349). They noted that antidepressants caused subjects to experience relief of depressive symptoms sooner, though at the end of 16 weeks each group equally experienced a reduction of depression.

Research on the benefits of regular physical activity has expanded beyond its relationship to depression and into the broader realm of psychology. Positive psychology is a relatively new field of psychology that is mainly concerned with “the various contributors to a healthy and thriving life for the self and others” (Park et al., 2014, p. 200). This realm of psychology specifically focuses on positive psychological states, traits, relationships, and institutions. More recently, researchers like Park et. al (2014) have been studying potential connections in positive psychology and positive health, which they define as a life characterized by “less frequent and briefer ailments, greater recuperative ability, rapid wound healing, more physiological reserves, and chronic but not debilitating disease” (p. 201). In their research, they found that positive psychological assets tend to predict positive health. Such positive psychological assets include “positive emotions, life satisfaction, optimism, forgiveness, self-regulation, vitality and zest, life meaning, sense of purpose, volunteering, helping others, good social relationships, and spirituality” (p. 201). However, what seems to be missing from this research is if its positive health that influences positive psychology or vice versa. Some psychological assets like helping others, good social relationships, and forgiveness can be initiated by the individual, however. Positive emotions, life satisfaction, and optimism are not as easy to initiate and may be

associated with physical activity.

Another study concerned with positive psychology and its implications on physical health was conducted by J. Boehm and L. Kubzansky (2012). In their research, they sought to examine a potential association between positive psychological well-being and cardiovascular health. They defined positive psychological well-being (PPWB) as “a broad construct that includes indicators such as life purpose, personal growth, positive emotion, life satisfaction, happiness, and optimism” (p. 655). They posited that all aspects of PPWB may not be associated with cardiovascular health so in their literature review they further distinguished between different facets of well-being such as purpose in life, personal growth, self-acceptance, environmental mastery, autonomy, life worth living, happiness, satisfaction with life, positive affect, optimism, and vitality. The team analyzed and assessed studies that measured cardiovascular events, cardiovascular disease progression, as well as cardiovascular mortality. They examined how PPWB relates to these cardiovascular measures to determine its relationship. The team found that “after controlling for traditional risk factors such as demographic, biology, and behavior, as well as major depressive disorder and hostility, individuals with a greater sense of control had a diminished risk of cardiovascular-related death” (p. 669). Additionally, they found that Japanese people that reported having a sense of life worth living, *ikagi*, were less likely to die from cardiovascular disease. Also, those without a sense of life worth living were at greater risk to poor cardiovascular health. Though their findings indicated that the association between hedonic well-being and cardiovascular health was less consistent, they found eight studies that assessed the relationship between cardiovascular disease, optimism, and vitality. After accounting for typical risk factors such as age, education, alcohol intake, BMI, cholesterol, and biology, all eight of them demonstrated a negative correlation of cardiovascular disease and well-being.

Ultimately, the team concluded that “PPWB is clearly associated with cardiovascular health” (p. 684). They advise that further investigation of PPWB is warranted because of its implications with regards to its protective factors against cardiovascular disease.

Other researchers like Wang et al. (2012) narrowed their study of positive psychology to evaluate the influence of physical activity on happiness, which they define as “a state of mind or a feeling characterized by contentment, love, satisfaction, pleasure, or joy” (p. 1095). In attempt to examine long-term effects of physical activity on happiness, they collected data from the National Population Health Survey (NPHS) between cycle 1 in 1994-1995 and cycle 2 in 2008-2009. Their evaluation involved examining the likelihood of becoming unhappy in relation to their activity level over a two and four-year period while controlling for age, body mass index, marital status, employment, educational level, income, chronic disease, social support, and health-related activity limitations. The team concluded that “a change in leisure-time physical activity from active to inactive was associated with increased odds of becoming unhappy 2 years later” (p. 1095). However, a major limitation in this study is that happiness is a self-generalized evaluation and the activity levels recorded in the survey were all self-reported.

These studies have indicated a connection between physical exercise and subjective well-being. However, what is missing is the neurological and biological basis for how fitness relates to mental health. Many neuroscientists like Dr. Wendy Suzuki, explore this connection in their research. As a professor of neuroscience and psychology at New York University, Dr. Suzuki began studying the neuroscience behind physical activity once she realized that she spent most of her life dedicated to her career in research which resulted in neglecting her own personal needs, namely her physical fitness. Staying true to her inquisitive and curious nature, Dr. Suzuki was fascinated with how the brain can adapt and create new connections when exposed to an

engaging and novel environment. After reviewing the related literature, she came across Dr. Marian Diamond's research. Diamond studied the environment's effect on the brain. In an experiment, Diamond noticed a change in brain matter when conducting a study involving rats and the presence of a running wheel. She found that the rats that accessed the running wheel developed thicker cortices, more synapses, and demonstrated higher levels of neurotransmitter activity than the rats without the enriched environment. These neural pathways are enhanced when subjects are exposed to physical exercise allowing an increase in the production of neurotransmitters. This production allows an increased transmission of the neurochemicals responsible for mood, specifically dopamine, serotonin, and endorphins. Shortly after Suzuki started exercising regularly, she began noticing an improvement in her mood. Though she was initially concerned about the amount of time she would have to devote to exercising, she realized that her new routine had other mental benefits that would counter the time commitment. She noticed that she was more productive, attentive, and energetic at work, all because she adopted regular physical activity into her routine (Suzuki, 2014).

A major factor that contributes to physical health and fitness is nutrition. However, what is often ignored is how our nutrition affects our mental health. David Benton (1999) argues that our emotions can be impacted by nutritional deficiencies. Such emotional indicators are often presented before we experience any physical signs. Benton says that eating a healthy diet lowers your chances of feeling depressed. Dr. Kathi Kemper and Dr. Scott Shannon (2007), who also study nutrition's impact on mental health, found that nutritional therapies can be responsible for promoting healthy moods and in a similar fashion as physical activity. "Because the mind-body connection is real, promotion of mental health, including healthy moods, relies on very similar strategies to those promoting physical health (p. 2). They posit that nutrient-rich foods allow the

brain to produce the necessary chemicals to maintain a healthy mood. Specifically, “nutrients are essential for optimal production of neurotransmitters affecting mood such as serotonin” (p. 3).

Though there are numerous studies that assess a potential connection between physical activity and positive mental health, there is not enough evidence to prove causation. However, between the studies in neuroscience, physical activity, and nutrition, there appears to be a connection worthy of additional research. There is a need for randomized controlled trials testing the impact a regular fitness regime has on mental health. Such an established connection could lead to physical activity being established as an evidence based intervention to combat certain mental ailments such as depression and anxiety.

Nature and Happiness

Alex Sharp

Introduction

Many research studies discuss the benefits of natural environments on both physical and mental well-being. However, it is rare to see an actual definition of what defines a natural environment. Is a natural environment only a wilderness area that has remained relatively untouched by humankind? Can a park or a greenspace in an urban setting be considered a natural environment? Most studies on the benefits of natural environments lack a definition and just assume that the reader has the same definition as the researchers. Various fields of study have differing views of what defines a natural environment. Literature and studies focusing on nature and recreation have defined a natural environment as a wilderness environment, while varying other disciplines have referred to “everyday nature” trees, backyards, etc. as pieces of a natural environment (Mausner, 1996).

Regardless of a true definition of what a natural environment is, there is a growing body of evidence that suggests that spending time in nature has extremely beneficial aspects to human functioning such as restoring attentional capacity, lowering blood pressure, and increasing positive moods. Due to the lack of a proper definition of what a natural environment is, studies for this review were not selected based on how natural environments were defined, but rather, they were selected based on the discussion of the effects nature has on physical and mental well-being. The following review will explore how nature is a restorative environment, nature's physiological and cognitive benefits, how nature contributes to workplace satisfaction, and finally, how nature has the potential to benefit children.

Restorative Environments and Attention

Kaplan (1995) discusses how nature provides restorative benefits and how stress can be reduced through natural environments. Four characteristics are used to classify restorative environments: being away, fascination, extent, and compatibility. Being away refers to a natural setting that is preferred for an extended restorative experience. However, with respect to being away, it does not necessarily have to be a far distance. The natural environment needs to be accessible and needs to provide a restorative benefit. With fascination, many elements in nature provide fascination to most human beings. Some of these include motions of leaves, snow, sunrises and sunsets, as well as clouds. When defining extent, it refers to being connected with nature and feeling as if one were in another world. Lastly, compatibility is the relationship between humankind and nature (Kaplan, 1995).

Kaplan (1995) refers to a couple of empirical studies. One of the studies took a wilderness vacation group and an urban vacation group and compared them with a non-vacationing group. The study found that the wilderness group had the highest levels of happiness

of any of the other groups. Another study used cancer patients, and participants were required to do a couple of restorative activities a week. The study provided evidence to suggest that participants in the study exhibited better performance with attention span. The article concludes by stating that restorative environments in nature can provide benefits to stress. (Kaplan, 1995).

Using the work of Kaplan's (1995) restorative environments, Berto (2005) looks at whether exposure to restorative environments helps recover from mental fatigue. The study used three experiments to measure results. For experiment one, thirty-two undergraduate students at a university in Italy were used for the study. The participants were administered the Perceived Restorativeness Scale (PRS), which contained 29 items which measured restorative qualities, such as fascination, being away, coherence, compatibility, and scope. After the test, the participants viewed photographs of both restorative and nonrestorative environments. The data yielded that the pictures of restorative environments had a larger effect in improved performance and those of nonrestorative environments (Berto, 2009).

Experiment two was like experiment one, except that participants were exposed to pictures of geometric patterns instead of restorative and nonrestorative environments. The data showed that the pictures of geometric patterns were neither restorative nor nonrestorative to the participant and did not create a positive effect nor a negative effect. Experiment three looked at whether longer exposure to restorative environments would improve performance. Participants were able to decide the time limit to look at the pictures whereas the other experiments had set time constraints on pictures. The results of experiment three were similar to that of experiment one in that the post-test performance of the restorative group improved. The study suggests that it varies on how long it takes an individual person to be restored and that designing environments

to be more comfortable could be beneficial to people needing a recovery from mental stress (Berto, 2009).

Nature and Cognition and Physiological Improvements

A study by Berman, Kross, Krpan, Askren, Burson, Deldin, Kaplan, Sherdell, Gotlib, and Jonides (2012) looked at whether being in nature influenced managing major depressive disorder. For the purposes of this study, 20 people with a diagnosis of major depressive disorder participated in a study where they were randomly assigned to take walks in two separate areas of Ann Arbor, Michigan; one of the two walking locations was in the urban-downtown area, while the other location was in a local park. Before and after walking, participants took a survey on their mood and short-term memory. The study found that the walks helped increase memory capacity in the nature walk when compared to the urban-downtown walk. Participants in both walks also reported increased positive mood, and the findings also provide evidence to suggest that people with depression gain more benefit from these types of interaction with nature compared to people without depression. One of the limitations of this study was the fact that this was a smaller sample size than desired. However, the study did show that nature can improve cognition in adults with major depression disorder (Berman et al., 2012).

A study by Park, Tsunetsugu, Kasetani, Kagawa, and Miyazaki (2009) investigated the effects of Shinrin-Yoku, which is defined as “taking in the forest atmosphere, or forest-bathing” (Park et al., 2009, p. 1). The goal of Shinrin-Yoku is to help increase one’s mental health and relaxation. This study was conducted using experiments in 24 forested areas in Japan; saliva was collected and was stored to measure cortisol levels, heart rate and blood pressure was also taken, and participants took the Profile of Mood States Survey. Twelve individuals participated in the study; six were monitored in a forested area, while the other six were monitored in more urban

environments. The study found that pulse rates were lower in the forest area, and blood pressure was significantly lower in the forest area, compared to the non-forested urban areas. The results of the Profile of Mood States Survey showed that tension rates, depression, and anger scores were lower for the participants in the forest setting. The results of the study, provided evidence to suggest that practicing Shinrin-Yoku lowered cortisol, pulse, nerve activity, and blood pressure for the participants in the forest setting compared to the urban setting (Park et al., 2009).

Haluza, Schonbauer, and Cervinka (2014) reviewed various studies that investigated the physiological effects of nature. The meta-analysis found generally positive outcomes with blood pressure, heart rate, and cortisol levels in individuals who regularly where in nature environments. Most of the studies used were from Japan and studied the impact of Shinrin-Yoku. In addition to this, most of the studies reported on mood and emotions of individuals while in nature. Overall, the findings provided evidence that there are positive benefits of nature in increasing health outcomes (Haluza, Schonbauer, and Cervinka, 2014).

A study by Hartig, Evans, Jamner, Davis, and Garling (2003) compared whether natural and urban environments had effects on blood pressure and emotion. The study included 112 students from the University of California, Irvine, and participants were compared in two separate environments. The natural environment was a 4,000-acre wildlife area in the Santa Ana Mountains, while the urban site was in a medium density office and retail area in Orange, California. Participants were administered pre-test and post-test measures from Zuckerman's Inventory of Personal Reactors (ZIPERS). In addition to ZIPERS, the Overall Happiness Scale was administered during the walk.

The study found that blood pressure decreased in the natural environment but increased in the natural environment after comparing scores from the pre-test and post-test. Positive affect

increased in nature and decreased in the urban setting, while feelings of anger and aggression declined in the natural environment and increased in the urban setting. Preventative health that stresses time in nature may have positive effects with the increase of health care costs and rising urban populations (Hartig et al., 2003).

Nature and Happiness

MacKerron and Mourato (2013) examined evidence that experiences in nature are positively correlated with greater health and happiness. One of these reasons is that outdoor experiences positively affect the nervous system, another is that natural environments have less triggers that cause stress. Lastly, natural environments facilitate behaviors including exercise and social interaction.

For the purposes of the study by MacKerron and Mourato, an app was created to have participants report how happy they were feeling as measured by a sliding scale. This app, though, was only available for Apple iPhone, iPad, and iPod users, which narrowed the sample. Participants were also asked about their current activities, such as what they were doing and who they were with. The study found that the participants were happier at home than at work, and also found that higher levels of happiness were associated with higher temperatures and sunshine. Outdoor activities and hobbies also showed higher levels of happiness among participants. The results of this study corroborated previous research on the subject that outdoor interactions are associated with higher levels of happiness (MacKerron and Mourato, 2013).

Nature and the Workplace

Many Americans spend a decent portion of time at their workplaces. A study by Kaplan (1993), investigated the relationship of how nature availability in the workplace can lead to happier and healthier employees. Kaplan conducted two separate studies; the first, involved 168

employees who worked at two different public agencies. Fifty-five of the participants did not have outdoor views from their desks, 60 could see outside from their desks, and the remaining 48 had jobs that required them to be outdoors. Participants were administered a survey that asked about workplace stresses, job characteristics, physical health, and life satisfaction. The study showed that the participants who worked outdoors felt that their jobs had less pressures and demands. Furthermore, the outdoor workers did not report as many health issues compared to those with desk jobs. This study also provided evidence to suggest that those employees who could see nature from their desks reported overall higher job satisfaction compared to those who could not see outside from their desks (Kaplan, 1993).

The second study was comprised of 615 participants from mostly sedentary jobs; 92% of the participants in the study were female. Participants were mailed a survey about daily hassles of life, and whether nature can be helpful in managing these hassles. The study found that the availability of being able to view nature had a higher mean with participants than those who could not easily view nature at work. Furthermore, those who had a view of nature were perceived to be happier, both in and out of the workplace (Kaplan, 1993).

The studies by Kaplan found that having windows in the workplace was important. In addition to this, being able to see parts of nature, such as trees, vegetation, and landscaping, provided the most effect. However, the study does cite that more research is needed to further advance this area of study (Kaplan, 1993).

Nature and Children

A study by Chawla, Keena, Pevec, and Stanley (2014) was conducted to see if there was evidence that green schoolyards could reduce stress and provide an environment to teach resilience to school-aged children. For this study, a green schoolyard for elementary- aged

children was defined as an outdoor play area, surrounded by trees. For middle school students, it was defined as an outdoor classroom, and finally for high school children, green schoolyards were defined as gardening programs within the school. Reviews of other studies found that green schoolyards provided high levels of physical activity, reduced stress, and increased student self-confidence. A review of the literature investigated stress and anxiety levels in children and teenagers and found that young people who exhibit high-levels of stress and anxiety are more susceptible for a variety of ailments, including mental health issues, lower immune systems, headaches, as well as respiratory and gastrointestinal disorders, and are also at higher risk for suicide. Research on resilience was also examined for the purposes of this study; resilience is defined as one's capabilities to overcome challenging situations. Studies found that in both children and adults, having access to nature was positively correlated with greater energy, happiness, and less anger. In addition to this, studies also found that students who garden, are more likely to eat more fruits and vegetables, and have higher academic gains than children who do not have access to the outdoors in school (Chawla, Pevec, Keena & Stanley, 2014).

Two school sites were used for this study; one was a private elementary school near Baltimore, Maryland, and the other site was an elementary school near Denver, Colorado. There were also four sites in Western Colorado where gardening at the high school level was examined. At the school site in Baltimore, students were allowed to roam through the woods, children were able to play with and explore parts of nature such as sticks, leaves, small animals, and rocks. Additionally, throughout the course of the study, students learned how to build their own forts. Students and parents reported positive interactions and learning in the woods (Chawla, Keena, Pevec & Stanley, 2014).

Students in Denver used the green playground as an outdoor classroom, and the students reported that even though learning was occurring, being outdoors alleviated some stress. When asked about this experience, students repeatedly used words such as “calm and peace” to describe the outdoor classroom. Teachers reiterated the attitudes of “peace and calm” for an activity called, “two minutes of silence.” This allowed students to take a couple of minutes to focus on what they wanted to learn for the day while in the outdoor classroom. Teachers across several disciplines used the outdoor classroom to teach. Furthermore, no instances of inappropriate behavior were seen while using the outdoor classroom (Chawla, Keena, Pevec & Stanley, 2014).

For the high school gardening program, students were asked about what came to their minds regarding being in a garden. Then the student participants were asked follow-up questions about their experiences in a garden; an analysis of key words was performed based on student responses. Words such as, “relaxed, peaceful, and calm,” were used repeatedly by the students. Overall, the study found that when students have access to nature in school, they are more positive and have reduced levels of stress and negative behaviors. The study also found that their findings were consistent with existing literature on green schoolyards (Keena, Pevec & Stanley, 2014).

Conclusion

More research is needed to provide greater evidence to suggest that having regular access to nature provides both positive physical and mental benefits. Additionally, a true clear definition of what defines a natural environment is needed to provide additional insight to future studies. As seen by the studies above, spending time in nature, as opposed to urban settings, has countless positive effects on well-being across all ages. Improvements can be procured by

something as simple as having access to windows in workplaces that allow employees to view trees and the sky outside (Kaplan, 1993). The benefits of being outdoors are obvious in that nature provides many essential resources that are useful in helping humans recharge and revive to be able to enjoy the best life possible.

Nature and Happiness Throughout American History

Hannah Raines

This connection between nature and mental well-being is not a novel one and has been intuited throughout history. This idea that the natural world possesses restorative properties appears to have its roots in a widespread and persistent belief that nature is sacred, or at least is where the divine can be found. Because of my background in American history, my primary task will be to trace some of these attitudes through American thought, beginning with an examination of Native Americans' relationship with nature and concluding with an exploration of those iconic figures often credited with founding the modern American environmental movement. I do not mean to suggest that global ideas and perspectives are not valuable in a discussion on nature and happiness; however, a comprehensive examination of the historical context of the connection between nature and happiness is beyond the scope of this paper. My aim is to clearly illustrate that this connection has long been recognized by individuals.

Native Americans are often credited with being America's first conservationists for their sustainable hunting and agricultural practices. Some tribes formed hunting preserves to safeguard against the extinction of beavers and other animals. Some grew beans and corn together, demonstrating an understanding of soil health (Jacobs, 1978). Many of their agricultural practices appeared frenzied and disorganized to European settlers but yielded a large amount of produce per acre and kept more land untouched by humans (Cronon, 2003). In the mid-twentieth

century, Sioux Indian and American historian Vine Deloria, Jr. (1970), explained the Natives' relationship with nature: "The land-use philosophy of Indians is so utterly simple that it seems stupid to repeat it: Man must live with other forms of life on the land and not destroy it" (p. 189).

Perhaps the Natives' responsible approach to food gathering was influenced by their belief that nature is sacred. In the late nineteenth century, George Bird Grinnell (1889), a sportsman and friend of Theodore Roosevelt described the Pawnee belief that the divine – which the tribe referred to as *Ti-ra'-wa* – existed within nature in his book *Pawnee Hero Stories and Folk-Tales*: "The sacred character of *Ti-ra'-wa* extends to animal nature. The fishes which swim in the rivers, the birds of the air and the beasts which roam over the prairies, have sometimes intelligence, knowledge and power far beyond those of man" (p. 17). Clearly Native Americans found value in nature beyond its tangible benefits to humankind; their beliefs and protectionist practices influenced environmentalist thinking throughout American history and continue to have an impact today.

While many early European settlers had a destructive relationship with the natural world, the Quakers are often recognized for their unusually harmonious connection to wilderness. Quakers believed that in nature one could commune with God, a concept not unlike the Pawnee tribe's ideas about the existence of the divine in the natural world (Kelley, 1986). Their high regard for the Native Americans' conservationist principles sets them apart from other early American religious traditions, which often viewed nature as something to be feared, tamed, or conquered (Cronon, 2003). According to American history scholar Donald Kelley (1986), many early Quakers saw value in protecting wilderness, while some even chose to eat a vegetarian diet.

Some Quakers who resided in the rural countryside expressed disdain for the urban environment and increasing industrialization. One of the most prominent early Quakers, William

Penn (1901), saw value in what he termed “the country life,” which he strongly preferred to urban living: “For there we see the Works of God; but in Cities little else but the Works of Men: And the one makes a better Subject for our Contemplation than the other” (p. 100). He further described “the country life” as a “Sweet and Natural Retreat from Noise and Talk,” that it “allows opportunity for Reflection, and gives the best Subjects for it” (p. 101).

Penn not only revered nature for its connection to the divine, as well as its restorative properties, but he worked to protect wilderness for the sake of its intrinsic value. He incorporated this appreciation for nature into his plans for the city of Philadelphia, referring to it as a “greene Country Towne” (as cited in Frost, 1849, p. 113). He created public parks and determined that each house would stand in the center of its lot “so there may be ground on each side for Gardens or Orchards, or fields” (as cited in Frost, 1849, p. 113). Penn’s protectionist philosophy, which he articulated in the seventeenth century, predated the beginning of the American preservationist movement, which scholars often argue emerged with the Transcendentalist movement in the nineteenth century (Nash, 1967).

In the nineteenth century, Ralph Waldo Emerson, arguably the most well-known figure in the Transcendentalist movement, shared similar beliefs with the Natives and the Quakers in that he considered the divine to be present in the natural world, which is evident from what he professed to experience while in the wilderness: “I am nothing; I see all; the currents of the Universal Being circulate through me; I am part or particle of God” (Emerson, 2003, p. 39). According to scholar Robert Richardson (1995), Emerson loosely associated himself with Quaker ideology, claiming he had more in common with the Society of Friends than any other religious sect. Like Penn, Emerson articulated this belief that nature possessed certain restorative powers: “In the woods, we return to reason and faith. There I feel that nothing can befall me in

life, – no disgrace, no calamity, (leaving me my eyes) which nature cannot repair” (Emerson, 1990, p. 18).

In the mid-nineteenth century, Henry David Thoreau (1857), another eminent Transcendentalist, expressed similar thoughts about nature and its restorative abilities: “Alone in distant woods or fields... I come to myself, I once more feel myself grandly related. This cold and solitude are friends of mine” (p. 208). Thoreau often referred to nature in terms that depicted it as a sort of companion or friend. A true introvert, he found continuous interaction with others to be exhausting and remedied this irritation with civilization by immersing himself in wilderness, seeking refuge by Walden Pond for more than two years, from July 1845 to September 1847. Thoreau enjoyed the retreat, and, in his explanation for why he chose to live by Walden Pond, stated, “I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived” (Thoreau, 1910, p. 178). His time in nature provided him an opportunity to remove himself from the superficial habits and customs of society and appreciate an exciting natural world.

Both Emerson and Thoreau’s writings profoundly influenced iconic American preservationist John Muir, who, in 1893, journeyed to the cemetery in which both men were buried and laid flowers on their graves. In a letter to his wife, Muir expressed how affected he was by the experience, commenting that he was “moved at the site of the resting places of these grand men” and adding, “I could not help thinking how glad I would be to feel sure that I would also rest here” (Muir, 1996, p. 311).

Like figures before him, Muir benefitted greatly from nature’s restorative properties. In a letter to his friend in which he declined an invitation to visit, opting to venture into the mountains

of Yosemite instead, he wrote, “I am bewitched, enchanted, and to-morrow I must start for the great temple to listen to the winter songs and sermons preached and sung only there” (Muir, 2001, p. 94). Muir often used religious language in his descriptions of nature. In an essay arguing for the importance of protecting California redwoods, Muir (1920) stated, “Through all the eventful centuries since Christ’s time, and long before that, God has cared for these trees, saved them from drought, disease, avalanches, and a thousand storms” (p. 4).

Muir’s profound affection for nature is evident in his essay titled “The American Forests,” in which he used vibrant descriptions of the American natural landscape to persuade others to see its value. According to Muir (1897), American forests were “the best [God] ever planted,” and the United States was home to “exuberant” forests, “bright seas,” and “happy birds and beasts” (p. 145). He desired to preserve the forests for reasons beyond practicality; he found intrinsic value in nature that deserved to be protected, regardless of whether humans reaped some tangible benefit from it.

Muir’s impact on American environmental causes cannot be understated, especially given his influence on Theodore Roosevelt, who was an avid nature lover, a sportsman, and the first conservationist president. Following John Muir’s death in 1915, Roosevelt wrote a tribute to the preservationist, which appeared in *Outlook Magazine*. In it, Roosevelt (1915) recounted a camping trip he had taken with Muir and referred to Muir as “an emphatically good citizen” who was “brimming over with friendliness and kindness.” Roosevelt concluded the piece by commenting on Muir’s ability to inspire others: “His greatest influence was always upon those who were brought into personal contact with him. Our generation owes much to John Muir” (p. 27).

In *An Autobiography*, Roosevelt (1913) described Yosemite in a style similar to much of Muir's writings about the park. The president noted the "majestic trunks" of the sequoias, which he described as being "like the pillars of a mightier cathedral" (p. 322). Roosevelt's use of religious imagery in his writings about nature illustrate a profound sense of awe for the natural world.

Like so many who came before him, Roosevelt found nature to be restorative. Following the death of his wife and mother in 1884, Roosevelt left his infant daughter with his sister and sought solitude in nature to deal with his grief. He set out for the Badlands of North Dakota where he established Elkhorn Cattle Ranch (Di Silvestro, 2009). According to scholar Douglas Brinkley (2009), Roosevelt's time at Elkhorn is when he began to form his crusade to protect American wilderness. Brinkley states, "The immortal beauty of America's rivers and its vast prairies, rugged mountains, and lonely deserts stirred him to nearly religious fervor" (p. 6).

Although often considered a strict conservationist, Roosevelt's passion for land protection extended beyond a desire to conserve resources or game animals for future use. He understood the importance of conservation for human use, but he also had a non-utilitarian appreciation for wilderness, not unlike the Native Americans and figures such as William Penn, Henry David Thoreau, Ralph Waldo Emerson, and John Muir. In 1905 he expressed a desire to preserve the United States' natural wonders:

Surely our people do not understand even yet the rich heritage that is theirs. There can be nothing in the world more beautiful than the Yosemite, the groves of giant sequoias and redwoods, the Canyon of the Colorado, the Canyon in the Yellowstone, the Three Tetons; and our people should see to it that they are preserved for their children and their

children's children forever with their majestic beauty unmarred (Roosevelt, 1905, p. 317).

With Roosevelt's presidency, an individual with enormous political power was finally recognizing this connection between nature and mental well-being. Roosevelt's belief in nature's restorative properties propelled him to work tirelessly for preservationist and conservationist causes, including establishing five new national parks, creating the U.S. Forestry Service, and setting aside several tracts of land to be protected as forest reserves. Douglas Brinkley (2009) provides an apt description of Roosevelt's impact on wilderness protection, "As president he promoted the pro-wildlife approach with revolutionary zeal" (p.6).

Barriers to Access

Hannah Raines

Clearly the research indicates that fitness and spending time in nature have positive impacts on mental well-being. Unfortunately, having knowledge of these mental health benefits does not always translate to increased participation in recreational activities for many individuals. In 2015, 51% of the adult population in the United States did not meet the federal physical activity guidelines for aerobic activity (Centers for Disease Control and Prevention, 2016). In a study on exercise habits of 126 low-income patients at community health centers, Schrop et al. (2006) noted that 60% of participants reported having discussions with healthcare providers about the benefits of exercise; however, researchers found that these discussions had no relationship with actual involvement in fitness activities. This startling find indicates that health initiatives which focus solely on disseminating information about the positive benefits of exercise are not sufficient. Barriers to access must be considered and addressed to increase engagement in fitness and nature activities. Multiple studies have explored these barriers and

from this research, four common obstacles to participating in recreational activities have emerged: a lack of time; low socioeconomic status; geographic location; and mental health issues, including stress, depression, anxiety, and self-esteem struggles.

Many studies report a lack of time as a barrier to participating in fitness and outdoor activities. Greaney et al. (2009) interviewed college students to identify barriers to maintaining a healthful weight. Participants reported that the time constraints associated with being a college student make it difficult to engage in exercise; however, some students noted that getting into a routine might allow them to incorporate exercise into their schedule, which indicates that, for some students, a lack of effective time management, rather than time constraints, are responsible for their physical inactivity.

Schrop et al. (2006) reported lack of time to be the second most cited barrier to physical activity among their sample of low-income individuals, which was comprised of 79% women. Additionally, the researchers found that those with children under the age of 18 were even less likely to engage in exercise, which is likely due in part to the many time constraints placed on parents.

Lascar, Kennedy, Hancock, Jenkins, Andrews, Greenfield, & Narendran (2014) reported that among their sample of patients with type 1 diabetes, work and other demands were considered a larger barrier to physical activity than participants' health problems. Patients reported that work schedules and caring for children were major demands on their time. However, several participants admitted that the barrier was more likely a time management problem or an unwillingness to prioritize exercise, rather than a true lack of time.

Low socioeconomic status and one's geographic location emerged as additional barriers to access to fitness and outdoor recreational activities. A study of immigrant school children in

Canada found that the high cost of participation in sports and physical activity programs inhibited many children from being involved (Shea & Beausoleil, 2011). Because the habits and patterns we forge in childhood often impact those we have throughout our life, this finding is particularly troubling. Involvement in sports is one of the primary ways children gain exposure to fitness.

Another study examined physical activity levels among rural low-income youth in three communities in Maine. Residents in urban and suburban environments might assume that rural inhabitants have access to endless fitness or nature-based activities; however, Yousefian, Ziller, Swartz, & Hartley (2009) make a compelling case for the contrary in their article which outlines the barriers cited by these youth, which included safety and lack of facilities or public open spaces.

Many children in the study considered safety to be a barrier to fitness and spending time outside. Several used the phrase “stranger danger” during their interview. Yousefian et al. (2009) noted that this fear of criminals may be more present in rural communities because individuals perceive a greater risk of danger in isolated or remote settings. In addition, the children mentioned traffic as another safety issue because their communities did not cater to pedestrians and lacked adequate sidewalks.

Another barrier cited by the children was lack of space in which to participate in fitness or outdoor activities. These communities had few public open spaces for residents to use, and many expressed a desire for more parks in their neighborhoods. In addition, many lacked access to reliable transportation that would allow them to be involved in sports. In rural areas, there is often greater distance between places and few public transportation options, and some of the

children commented on their parents' inability to transport them to practices or events (Yousefian et al., 2009).

Izenstark, Oswald, Holman, & Mendez (2016) explored the barriers to access among low-income mothers in rural areas. They found that these mothers were well aware of the benefits of spending time in nature and often expressed a desire to spend time outside with their families. However, the mothers felt hindered by poverty and lacked access to free, public recreational opportunities.

Estabrooks, Lee, & Gyuresik (2003) took a different approach to examining how one's geographic location can hinder access to fitness resources by studying one mid-sized Midwestern city. Using the Internet and information from school district officials and the department of parks and recreation, researchers compiled a list of 177 resources for physical activity, including parks, sports facilities, fitness clubs, community centers, and trails. They obtained addresses for each resource and then used census tracts to categorize neighborhoods into low, medium, and high socioeconomic status. Unsurprisingly, they found that high income neighborhoods had access to more physical activity resources, including free, public options.

An intervention to address the lack of access among individuals who reside in low-income communities further illustrates how these barriers impact fitness behaviors. Choitz, Johnson, Berhane, Lefever, Anderson, & Eiser (2010) designed a program to increase low-cost opportunities for residents in two low-income communities in Philadelphia. The membership fee was set at \$20 a month and members were not required to sign a contract. Although not specifically targeted, this program successfully reached traditionally underserved populations when it comes to fitness initiatives, including African Americans, older adults, and overweight or obese individuals. At the time the article was published, the centers were regularly generating

4,000 visits per month. The typical participant was a 54-year-old African American woman with a BMI that would classify her as obese. Because participants were not surveyed to determine motivations for accessing the services, the researchers can only offer hypotheses as to what contributed to the intervention's success. They point to culturally sensitive workers; the centers' emphasis on a safe, nonjudgmental, and welcoming environment; and the convenient locations of the centers as probable contributing factors. The intervention's success demonstrates the positive impact that increased access can have on low-income residents' fitness habits.

Mental health issues can also impede one's access to fitness opportunities. The association between stress and exercise is bidirectional; while exercise has been found to reduce stress levels, stress has been found to impact exercise habits. One study explored how the transtheoretical model moderates the relationship between exercise and stress. The model describes the six stages an individual progresses through in their journey to making a positive health change (Prochaska & Velicer, 1997). Individuals who participate in regular exercise are considered to exist in the maintenance stage, while those who do not engage in fitness nor recognize a need for exercise would exist in the pre-contemplation stage. Everyone else falls in a stage somewhere between the two. Lutz, Stults-Kolehmainen, & Bartholomew (2010) found a positive relationship between stress and exercise frequency among individuals who were already engaging in regular exercise and had been for a long time. Among every other group, the relationship was a negative one: high stress resulted in decreased exercise levels.

Other mental health problems can act as barriers to physical activity. Using secondary data from 9,000 British individuals involved in a previous health study, Da Silva, Singh-Manoux, Brunner, Kaffashian, Shipley, Kivimäki, & Nabi (2012) examined how depression and anxiety impact exercise habits. This longitudinal study found that anxiety and depression can act

as barriers to engagement in physical activity. Hypotheses posited to explain this relationship point to the various symptoms or issues associated with depression and anxiety, including social isolation, lack of motivation, lower energy levels, and health problems. In addition, Roshanaei-Moghaddam, Katon, & Russo (2009) conducted a literature review of eleven studies that found depression to be a significant risk factor for developing a sedentary lifestyle.

In other studies self-esteem and fear of embarrassment surface as personal barriers to fitness. In their interviews with immigrant youth in Canada, Shea & Beausoleil (2011) reported that female students expressed discomfort with participating in physical activities alongside their male counterparts. Additionally, students commented on the stigma associated with being overweight in western society and how it can impede individuals' access to fitness activities due to feelings of embarrassment and fear of ridicule. Lascar et al. (2014) also found that body-image issues and fear of embarrassment acted as barriers to exercise among their study of type 1 diabetes patients.

Implications

The outlined research seems to warrant the use of physical activity as a mental health intervention to increase stress management. Because of the various positive mental health benefits associated with fitness, mental health practitioners and their clients could benefit from incorporating physical activity into their treatment plans. Further, additional research into the mental health benefits of physical activity could warrant more effective public health initiatives at the local, state, and federal levels. Ideally, this would result in removing barriers of inaccessible and unsafe physical activity facilities and increasing access to healthy food sources.

In addition, a plethora of studies have outlined the correlation between the effects of nature and happiness among humans. Many organizations and workplaces can examine the relationship between nature and happiness as a method to better increase productivity among employees. Also, workplaces can encourage their employees to spend time in nature and take breaks in natural settings so that workers can experience the restorative effects that only nature can provide. In addition, schools and universities can use this knowledge to help promote outdoors education and to encourage students to take advantage of the benefits of the outdoors, which can help to relieve stress and to help increase academic gains. Cities and municipalities can create initiatives to help their residents utilize natural spaces and encourage residents to be active in nature and advocate for healthier lifestyles. Lastly, the research provides evidence to suggest that time in nature can increase attention span and manage stress, which is a benefit for humankind and for every individual human being.

Studies which examine the many barriers to fitness and spending time in nature offer important implications for future research and program interventions. The findings underscore the importance of increased access and visibility of physical activity and outdoor recreation resources. In addition, Choitz et al. (2010) provided compelling evidence of the positive impact that improved access can have on a low-income community. An increase in affordable opportunities in underserved communities would not only solve the geographic location and low-income barriers for the residents, but similar interventions have the potential to partially address the time barrier as well. Access to nearby facilities or public open spaces which cater to families may provide increased opportunities for parents and other individuals with busy schedules.

This examination of mental health barriers highlights the importance of interventions that emphasize a friendly, nonjudgmental approach, not unlike the one outlined by Choitz et al.

(2010). In addition, it suggests a need for improved conversations about fitness in healthcare settings. This becomes especially apparent when combined with the finding by Schrop et al. (2006) that conversations about the benefits of exercise between healthcare professionals and patients had no association with increased participation in fitness activities. Healthcare professionals should work to emphasize the positive effects of exercise on physical and mental health while approaching such conversations from a place of support and encouragement. Perhaps initiatives to educate clinicians about motivational interviewing strategies would prove beneficial.

Engagement in exercise and the outdoors has the potential to improve mental health outcomes. However, the likelihood of success in initiatives that aim to increase participation in fitness and outdoor recreation is bolstered when the multiple barriers to access – including time, socioeconomic status, geographic location, and mental health – are considered and addressed.

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