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Student Research Report

Nature Prescription and Health Outcomes: Grounding Exercise

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Clinical Review: Nature Prescription and Health Outcomes

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SOCI 420: Phase 1 Assignment

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Examining Health in the Context of Nature

In the 1980s, some health scholars began to break away from the usual emphasis on the use of medicines to promote health (Doughty, 2018). These scholars were advocating for a more holistic understanding of human health. According to this more holistic theory, an individual's health is influenced by the physical settings, and broader sociocultural influences that belong to the place where the individual is embedded in (Doughty, 2018). Such holistic health theories are not entirely new. More than two thousand years ago, the supposed half god Asclepius was performing healings at the ancient healing place Epidaurus (Doughty, 2018). According to the researchers of this case study, it became evident that the physical environment, its natural beauty, its solitude, and the stunning architecture in combination with its symbolic meanings made the place work as a healing place (Doughty, 2018).

A more recent example of how nature and health are correlated with each other comes a study that reviewed over 120 studies to provide an overview of these afterwards (Gorman, 2017). Overall, they concluded that a natural landscape has the potential to serve as a health resource, finding linkages between natural landscape and mental, physical and social wellbeing (Gorman, 2017). Before specifying on how these are related, it should be made clear that there exists no relation between individuals and natural landscapes that is universal for every human being. For instance, while for some a particular forest can be a place of relief, for others it can be a place where they had negative past experiences, or for minorities it can be a place of danger and anxiety. Therefore, the health effects of nature are dependent on both the physical factors, but also how these are perceived by an individual (Gorman, 2017). Yet, the study does argue that in general it can be possible for a natural landscape to promote human health (Gorman, 2017). First

of all, being in nature can increase one's mental health. According to Gorman (2017), one aspect of mental health that is influenced by nature is the restoration of attention. When in a natural environment, people have the opportunity to become distanced from their daily lives. It can be a place to clarify and reflect on personal goals and vital matters, and it can be a place to discover new things in a non-exhausting way. These contributions to attention restoration are more restorative in a natural landscape than in an urban. Moreover, in a natural environment there are low sound levels which can stimulate rest and relaxation (Gorman, 2017). While being in natural landscapes, it has also been found that when being in a natural landscape, certain emotional reactions are released that affect stress recovery, which in turn benefits people's attention, conscious mental processing, and behaviour and physiological reactions (Gorman, 2017). Moreover, when looking at a landscape that is perceived as pleasant, negative feelings and thoughts are replaced by positive ones, such as cheerfulness and calmness (Gorman, 2017). Finally, Gorman (2017) shows that natural landscapes promote people's ability to express positive feelings like joy and satisfaction. So, there are a lot of mechanisms that explain how nature could promote mental health (Gorman, 2017). Nature also contributes to the promotion of physical health (Gorman, 2017). Literature has revealed that the way how the urban environments are designed is crucial for the physical activity in the daily lives, work, and leisure time of the people living in these environments (Gorman, 2017). Research has shown that parks and forests promote physical activities (Gorman, 2017). Also, urban environments can promote physical activity, as long as they are perceived as being aesthetically appealing (Gorman, 2017). Lastly, nature also serves as a place that promotes and facilitates social wellbeing (Gorman, 2017). A park for instance can be a way to stimulate social integration (Gorman, 2017). Literature has suggested that attractive urban environments that are rich in vegetation can

promote social integration (Gorman, 2017). In other ways, nature can serve as a place of community building (Gorman, 2017). For instance, with community gardening, people get into personal contact with each other, and a community network is developed (Gorman, 2017). Also, nature has served as a place where experience programs like taking a vacation or meeting a challenge like rafting in nature can take place around (Gorman, 2017). Also, during these experience programs social wellbeing can be promoted (Gorman, 2017).

Forest-Bathing as Evidence for Nature Prescription

Forest bathing, otherwise known as *Shinrin-yoku*, is a concept that was coined by the Japanese Ministry of Agriculture and Forestry back in 1982, which they define as making contact with or taking in the atmosphere of a forest (Park et al., 2010, p.1). The act of forest bathing or “taking in the atmosphere of forest” is often meant to be completed by taking a walk in a forest while being mindful and reflective of one’s natural surroundings. Although, the concept has only recently emerged, there has already been plenty of studies outlining the positive health effects that populations of all ages can experience from forest bathing (Seltenrich, 2015, Mao et al., 2017). In particular, many studies have been conducted outlining the positive effects of forest bathing on young-adults or university students in regard to reducing stress deriving from: exams, financial stressors, campus life, and relationships.

In fact, in a recent study by Zhou et al. (2019), studying the effects of forest bathing in undergraduate students, researchers found that students felt reduced anxiety levels in regard to exams, campus life and relationship after coming in contact with a forest setting (p.148). Apart from the positive effects experienced by being physically present in a forest, researchers also found that forests with a higher amount of biodiversity had a more positive impact on reducing

student's anxiety levels than a forest with less biodiversity (p.148). This is important to note because it questions the effectivity of forest bathing in engineered forests versus forest bathing in natural forests.

In a similar study conducted by Lee et al. (2014), researchers also found that in contrast to urban walking, forest walking had the potential to decrease negative-mood states in young adults (average age studied 21.5) such as, tension-anxiety, anger-hostility, fatigue and confusion (p.4). Furthermore, in terms of studying the physical bodily changes that students experience after spending some time in a forest setting, they also found that forest walking significantly increased parasympathetic nervous activity (p.4). Or, in other words that forest walking had the potential to make the body feel relaxed enough to conserve energy and lower heart rate – trends which are often linked to activities such as meditation and yoga (p.4).

Similarly in terms of changes in bodily functions, Park et al. (2010), found that spending time in a forest environment had the potential to lower concentrations of cortisol, pulse rate, and blood pressure (p.25), and just as Lee et al. (2014) had found, forest walking also had the potential to increase parasympathetic nerve activity. Additionally, they also found that interacting with a forest setting also had the potential to lower sympathetic activity in students (p.25), which means that flight or fight responses were lowered after participating in forest walking. It should be noted that although the literature on the effects of forest bathing on young adults/university students is plentiful and seems to be conclusive of the fact that forest bathing is effective in reducing stress levels, most have been conducted in East Asia. Consequently, there is a need for more studies showing the effects of forest bathing in students in other parts of the world, as one's geographic location and forest type availability might impact results.

Health Outcomes of Mindfulness

Mindfulness is an ancient concept with its roots in Asian Buddhist contemplative practice. It is considered an inherent capacity that can be cultivated through various meditative practices. Some of such practices involve paying close attention to the present moment and letting go of judgements, for instance, the labelling of thoughts/responses as good or bad (Robins et al., 2014, p. 511). An example of mindfulness practice is “being mindful of a particular object or phenomenon, such as one’s breathing, which entails observing the moment-to-moment sensations of each inhalation and exhalation in a receptive, curious manner” (Robins et al., 2014, p. 511). According to Azam et al. (2016) “attention to breathing sensations has several purposes: it orients one to a present timeframe, generates a relaxation effect, and can be readily resumed after distractive mind wandering” (p.143).

Research has shown that mindfulness enhances health and well-being by increasing attention, awareness, and acceptance of thoughts and emotions, which in turn, increases adaptation to stressors (Robins et al., 2013, p. 515). Azam et al. (2016) state that “regular mindfulness meditation improves the neurophysiological health of cortical areas associated with attention and emotion regulation” (p.143). A corresponding argument is that “mindfulness has been associated with altered intrinsic functional connectivity suggesting improved focused attention, sensory processing, and reflective awareness of sensory experiences” (Robins et al., 2014, p. 512). Resultantly, some of the mental mechanisms through which mindfulness enhances mental health include decreased negative rumination, improved emotional regulation, nonattachment, and less ego-focused thinking (Robins et al., 2014; Azam et al, 2016). Hence, with constant practice, awareness of present-oriented experiences combined with a nonjudgmental attitude towards internal experiences, can reduce distress (Azam et al., 2016).

Furthermore, evidence shows that mindfulness can promote self-care in a variety of clinical and healthy populations as it can be taught and implemented regardless of a patient's race, ethnicity, or socioeconomic status (Robins et al., 2014). This has been proven effective through the study conducted by Azam et al. (2016) with undergraduate university students, where a mindfulness meditation program, which focused on the "mindfulness of breathing" (p.146), was implemented as an alternative mental health program. The researchers implemented such a program in response to the strain caused in traditional university counselling resources through increasing rates and complexities of mental health disturbances, the large number of students who fail to receive adequate support via traditional counseling, students' lack of sufficient time for counseling treatment, and their preference of dealing with stress-related issues autonomously (Azam et al., 2016). Their study showed that "over time, participants who continued mindfulness practice showed evidence of improved stress adaptation, with decreasing anxiety sensitivity scores, indicating reduced fear of physical and psychological anxiety" (p. 157). Their findings further suggest that negative moods linked to depressogenic self-critical traits can be modified through mindfulness meditation practice.

Another effective outcome of fostering attention and awareness through the practice of mindfulness is nature connectedness. Nature connectedness is defined as an "individual's experiential sense of oneness with the natural world" (Howell et al., 2011, p.166). The researchers conducted two studies using samples of undergraduate students where they examined associations among nature connectedness, well-being, and mindfulness (Howell et al., 2011). They found that all three factors were significantly interrelated, such that higher degrees of connectedness to nature were associated with greater well-being and greater mindfulness. The researchers concluded that the aspect of enhanced awareness of mindfulness is important to

nature connectedness which, they argue, is found to have psychological well-being (Howell et al., 2011).

Practicing Mindfulness

Mindfulness is thus understood as the introspective practice of reorienting oneself to the present moment by paying attention to and observing individual experiences, thoughts, emotions, and sensations in a manner that is purposeful, uninterrupted, non-reactive, and judgement-free (Milby, 2017; Jeffers, 2018). As the evidence suggests, it remains an effective way of improving multiple facets of human health. To that extent, its practice encompasses focusing on one's breathing, recognizing one's environmental surroundings, conducting a body scan, meditating while walking, and eating mindfully (Jeffers, 2018). Furthermore, it can also be practiced through grounding (also known as 'earthing'), which refers to the act of bringing the human body "[...] [in] contact with the Earth's surface electrons [...] [to facilitate the transfer of] energy from the ground into the body" (Chevalier et al., 2012, p. 2). Several scientific studies have found that grounding is beneficial at physiological and psychological levels: in addition to being a "simple, natural, and profoundly effective environmental strategy against chronic stress, ANS dysfunction, inflammation, pain, poor sleep, disturbed HRV, hypercoagulable blood, [...] many common health disorders, including cardiovascular disease" (Chevalier et al., 2012, p. 7) and helping "[...] recalibrate the circadian rhythm, [...] reduce cortisol levels within the body, and [...] reduce inflammation in cellular structures [...]" (Hill, 2018, p. 26), it is also an effective mood enhancer and coping mechanism for heightened emotional states (i.e. anxiety, stress, panic, trauma, depression) in that it not only improves individual mood to a pleasant, positive,

and relaxed state of mind, but it also restores a sense of calmness and control over the situation (Milby, 2017; Chevalier, 2015).

A specific way to practice grounding and reap its broad range of benefits whilst accommodating for the limitations of our built urban environments is the 5-4-3-2-1 exercise. This is a sensory exercise that combines the capabilities of our five senses (sight, touch, sound, smell, and taste) to bring ourselves to the present moment by grounding ourselves in our surrounding environment (Ritschel, 2019; Milby, 2017). To do this exercise, the individual first identifies five things they can see, then, four things they can feel, three things they can hear, two things they can smell, and one thing they can taste. For example, for an individual going for a walk in the park, they may note green leaves, tall trees, cloudy skies, small squirrels, and short twigs and branches as five things they see; the cold air, wet raindrops, soft earth, and rough bark of a tree trunk as four things they feel; the howl of the wind, chirping of birds, and snapping of twigs under their feet as three things they hear; the petrichor and cherry blossom flowers as two things they smell; and the taste of the inside of their mouth as one thing they taste.

The value of this exercise has never been more pronounced than now where the restorative powers of natural environments are highly sought after in our extremely modernized, urbanized, and industrialized world (Berto, 2014). Hence, there is a need to “implace” (i.e. be placed in) our lived experiences of our existence in a way that does not exclusively distinguish between our built and natural environments, but rather, our ways of existing need to be grounded in the environment that we are placed in and consequently defined by, because we cannot be without the natural environment (Stefanovic, 2016). This is owing to the fact that our well-being and quality of life are intrinsically tied to the quality of where and how we are environmentally implaced (Stefanovic, 2016).

Mechanisms: Practicing Mindfulness in the Forest

Drawing the notion of mindfulness back to forest-bathing, a mechanism begins to reveal itself, where individuals may seek to combine elements of the two (i.e. practicing mindfulness in a forest-bathing setting) to ameliorate their mental health. As the aim of this project is an attempt to improve health and well-being among undergraduate students at UBC, both forest-bathing and practicing mindfulness offer points that are beneficial to this endeavour. First, practicing forest-bathing – within the context of undergraduate students – has shown to reduce effects of anxiety (Zhou et al., 2019, p. 148). Meanwhile, practicing mindfulness, through breathing exercises, has been claimed to relax the individual, while improving their neurophysiological health (Azam et al., 2016, p. 143). Taking these two notions that are relevant to health outcomes, both practicing mindfulness and engaging in forest-bathing can be viewed as complementary to one another in improving an individual's health outcomes. Therefore, the combination of both forest-bathing and practicing mindfulness is the basis upon which this project seeks to improve student health outcomes.

Similar to the mechanism of linking mindfulness to a natural setting (i.e. forest-bathing), a theoretical framework for the integration of mindfulness exercises in a nature-based setting has emerged (Corazon et al., 2012). The framework that is introduced by Corazon (2012) focuses on the act of gardening, while practicing mindfulness, as a therapeutic act. While the activity itself is distinct from practicing mindfulness (through breathing exercises) while forest-bathing, it is also similar in the sense that it seeks to apply existing therapeutic methods to a nature-based setting to potentially enhance the overall effects. In addition to practicing mindfulness in nature-based settings, there are further insights to be gained from broadening the scope of inquiry to

include other therapy-based practices conducted in nature. Rather than focusing exclusively on mindfulness, it is useful to look at a wider range of therapies that have been conducted in nature. Annerstedt and Währborg (2011) introduce the term, *nature-assisted therapy* (or, NAT), which is defined as any treatment or rehabilitative intervention “with the fundamental principle that the therapy involves plants, natural materials, and/or outdoor environments” (p. 372). After defining NAT, the analysis focuses on its effects through a systematic review of controlled and observational studies. While this conceptualization of a therapy is broader than the one that is envisioned for this project (which is more specific as it focuses on practicing mindfulness in an outdoor, natural environment), this systematic review claims that NAT is effective in producing positive health outcomes among individuals (Annerstedt & Währborg, 2011). In sum, practicing mindfulness in a forest-bathing setting may offer individuals the chance to improve their health outcomes. More specifically, the theoretical mechanism that was established (i.e. the beneficial health outcomes of forest-bathing and practicing mindfulness, and their complementary nature), combined with support from existing literature, this project envisions practicing mindfulness in a forest-bathing setting as an ideal approach to ameliorating health outcomes among UBC students.

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