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Nature Prescription in Canada: Why and How?

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This chapter reviews important definitions to set a context for the benefits of contact with nature for human health. Due to the great value of spending time in nature, discussion follows about the advantages of having a nature prescription program available for healthcare professionals to better support their patients and for the population to access easily to evidence-based content. The chapter closes with a brief examination of the need for systemic and equitable actions in this respect.

The Benefits of Contact with Nature on Human Health

Definition of health. According to the World Health Organization (WHO), "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"(WHO, 2023a). More specifically, mental health is defined as "a state of well-being in which an individual realizes his or her own potential, can cope with the normal stresses of life, can work productively, and is able to make a contribution to her or his community"(WHO, 2023b). As illustrated by these definitions, it is essential to emphasize that health relies on well-being rather than the absence of disorders in terms of physical, psychological, and social dimensions. Consequently, it is of primary importance to promote lifestyle habits and systemic actions that can contribute to these three aspects of well-being, and not only invest in curative practices. In addition, healthy behaviors can prevent many costly chronic diseases, such as type 2 diabetes, hypertension, coronary artery disease, chronic

obstructive pulmonary disease, and depression. Even from a curative perspective, healthy lifestyles should be a central focus.

In Canada, health matters are under provincial jurisdictions. For instance, in a province like Quebec – the second-largest province of the country in terms of population - the health budget represents over 40% of the total budget (Pelletier, 2022). Unfortunately, only 2.8% of the funds are allocated to prevention. In comparison, Quebec lags far behind other Canadian provinces, which allocate an average of 5.5% of their budgets to prevention (Bastien, 2023). Thankfully, in recent years, many marketing campaigns have been made, in Quebec and across the country, regarding tobacco cessation, moderation of alcohol consumption, the benefits of a healthy diet, and exercise. We think it is time now to bring contact with nature among the healthy habits that deserve attention, promotion, and inclusion in political issues. In a context where public actors must innovate through clinical, community, and institutional interventions to minimize the increasing burden of mortality and morbidity attributable to climate change (particularly in urban areas), the idea of a nature prescription program appears to be a solution that is available, inexpensive, and already has some form of social accessibility (Pétrin-Desrosiers, 2022).

Definition of contact with nature. Modern life has undergone very rapid urbanization. Thus, humans evolved from a nature-centered environment to an artificial environment (Kang et al., 2022). Absurdly, what used to be our home and our vital environment as humans is now studied to understand why and how it sustains human health. Scientific literature concerning the effects of forests on health was very poor before 1990 (Yeon et al., 2021). On the other hand, the First Nations Health Circles have well illustrated for many centuries how nature hosts human beings and thus how nature and health are intimately linked (St-Arnaud & Bélanger, 2005). Even though science has begun to be interested in the health benefits of nature since 1990, this was known and integrated long before that by indigenous people. It is also important to recall that nature should not be considered as belonging to the human being, but rather welcoming human life: “the interdependence of humans and the environment cannot be overstated” (Alexander & Brooks, 2022, p. 121).

Most of the scientific literature refers to forest bathing (Shinrin-yoku in Japanese) when studying the health benefits of contact with nature. Shinrin-yoku is a “traditional practice characterized by walking in a forest environment, watching it and breathing its air” (Park as cited in Antonelli et al., 2019, p.1117). It is considered to be the most widespread activity associated with forest and human health (Park et al., 2010). It is so popular in Japan that a new medical science called Forest Medicine has recently developed (Li, 2022). However, there are many other different ways to get in touch with nature. Some studies are even looking at the evidence regarding the benefits of indoor experiments of viewing nature (Jo et al., 2019) and nature experiences in virtual reality (Reese et al., 2022)

Based on several other authors, Pretty and colleagues (Pretty et al., 2005) discerned three levels of engagement with nature:

1. Viewing nature (through a window, picture, painting, etc.)
2. Being in presence of nature (sitting in a park, having plants in a room, etc.)
3. Active participation and involvement with nature (gardening, hiking, camping, etc.)

Of course, the benefits experienced vary according to the means chosen. Thus, the more contact and interaction with nature that are sustained, the more the impact on the constitution and duration of the beneficial effects will be notable, to a certain extent (see upcoming: How much nature is relevant to prescribe?). The proximity, the sensory pathway through which nature is experienced (visual, auditory, etc.), and the individual’s level of awareness while in a natural setting are other factors that need to be considered (Frumkin et al., 2017). In addition, a recent thesis (Guibert-Morin, 2021) revealed that, in addition to making ourselves physically and

mentally available, it is important to overcome the eco-anxiety that can be generated by current environmental issues to fully enjoy the benefits of contact with nature.

Benefits of contact with nature on physical health. The physiological benefits of interaction with nature that are scientifically proven (Grade A: scientific evidence established) are the reduction of blood pressure, the reduction of the heart rate, a decreased sympathetic nervous activity, increased parasympathetic nervous activity, and reduced cortisol levels (Bherer, 2021).

Many studies demonstrated that a short stay in a forest significantly reduces blood pressure (Ideno et al., 2017) and heart rate compared to a non-forest environment. Even a short-term viewing of forests has physiological relaxing effects such as lowered diastolic blood pressure and heart rate (Tsunetsugu et al., 2013). These effects stem from the impact of forests on the autonomic nervous system (Bherer, 2021). Being in contact with nature induces a relaxation state expressed by a decreased sympathetic nervous activity and increased parasympathetic nerve activity (Kobayashi et al., 2018). A recent meta-analysis confirmed that spending time in a forest for as little as 15 minutes can reduce cortisol (a stress hormone produced by adrenal glands) levels in a short term (Antonelli et al., 2019). All these parameters (blood pressure, heart rate, autonomous nervous activity, and cortisol levels) are stress indicators, and every change described above indicates a reduction of stress. It is therefore very clear that contact with nature helps to reduce physiological stress (Ochiai et al., 2015) in a short term.

The meta-analysis by Twohig-Bennett and Jones, integrating 143 studies conducted in 20 countries (half of these in Europe and a quarter in Japan) has an even greater significance: the authors conclude that exposure to green spaces is associated with a reduction in the incidence of type 2 diabetes, dyslipidemia (imbalance of fats in the body and blood stream), coronary heart disease, hypertension, and stroke, among others (Twohig-Bennett & Jones, 2018).

In addition to these stress parameters, it is known that forest bathing can have a strengthening effect on the immune system. It was found that a 3-day long forest bathing trip increased the number of natural killer (NK) cells and NK cell activity. NK cells are responsible for defending an organism against bacteria, viruses, and cancer. These effects lasted for 7 days after the trip (Li et al., 2008). Moreover, shinrin-yoku increases intracellular levels of anti-cancer proteins, suggesting a preventive effect on cancers (Li, 2022).

Benefits of contact with nature on Mental health. The psychological benefit of interaction with nature that is scientifically proven (Grade A: scientific evidence established) is the reduction of anxiety (Bherer, 2021) and depressive symptoms (Yeon et al., 2021). People living with and without physical or mental chronic diseases; students, workers, men, women, and the elderly all benefit from different interventions (mostly walking and mindfulness) in natural spaces, regarding mood, depressive and anxiety symptoms, although people dealing with mental conditions demonstrate the largest reduction in their symptoms (Yeon et al., 2021). Authors from this recent meta-analysis conclude that forest therapy has large effect sizes (a big impact) on alleviating depression (Hedges' = g 1.133) and anxiety (Hedges' g = 1.715) and that this is consistent with previous results.

Moreover, numerous studies demonstrated other significant mental health impacts for individuals who have been in contact with a natural environment: better health perception (White et al., 2019), perceived restorativeness, improved self-esteem, improved creativity (Bherer, 2021), potential role in preventing dementia (Yi et al., 2021) as well as improved sleep quality for everyone (Astell-Burt et al., 2013) and for people dealing with sleep complaints (Morita et al., 2011).

Benefits of contact with nature on Social health. Interestingly, some authors have highlighted the positive effects of contact with nature that impact social health. Specifically, Bratman and colleagues report that contact with nature sustains

a good mood and joy, fosters positive social interactions, and brings a greater sense of belonging and social cohesion (Bratman et al., 2019).

Benefits of contact with nature for kids. There are several advantages to bringing children into nature. First, children who spend time in nature are more physically active and less sedentary—especially if the green space is more diverse (Chawla, 2015). Also, children who play in nature instead of a traditional playground develop superior motor skills, balance, and coordination (Ingunn et al., 2004).

Regarding disease prevention, it is known that by exposing the developing immune system to a variety of bacteria that live in vegetation, animal species, and fertile soil, nature time improves its functioning by teaching it to attack dangerous molecules and ignore harmless ones (Rook, 2013). Moreover, kids who live in neighborhoods with more diverse vegetation and street trees develop asthma less often (Donovan et al., 2018) and children and teenagers who spend several hours outdoors each week are less likely to develop myopia (Sherwin et al., 2012). Finally, a study of over 900,000 people showed that children who grew up around more green space had a significantly lower risk of developing psychiatric illness as adults (Engemann et al., 2019).

Kids experiencing attention-deficit /hyperactivity disorder (ADHD) can also benefit from being in nature as kids with ADHD who took a 20-minute walk in a park vs. a city street improved their performance on a math attention test significantly more—rivaling the effects of stimulant medication (Taylor & Kuo, 2009). Furthermore, a study of 101 high schools showed that schools with more trees and plants visible from classroom windows had higher standardized test scores and graduation rates (Matsuoka, 2010).

Nature Prescription in Canada

Why is it important to prescribe? Writing a prescription has been shown to result in more behavior change than verbal advice alone (Swinburn et al., 1998). In this study "sedentary patients (n= 456) received verbal advice on increasing physical activity and were then randomized to an exercise prescription (green prescription) group or a verbal advice group" (Swinburn et al., 1998, p. 288). Six weeks later, the number of people engaging in any recreational physical activity increased significantly more in the prescription group. Also, patients sometimes prefer non-pharmacological options for fear of side effects or monetary reasons. Even when treating patients with medication, we get much better results by combining pharmacology and healthy behaviors. In fact, the concept of prescription for other treatments than pills (mostly for physical activity) is used all over the world, such as Green Prescription in New Zealand.

How much nature is relevant to prescribe? Studies on the health benefits of nature have implemented interventions that range in duration from 15 minutes to several consecutive days (Kotera et al., 2022) and in frequency from only once to three times a week (Yeon et al., 2021). However, White and al. focused their study specifically on the optimal duration of contact with nature to maximize the benefits. They found that people who spend at least two hours a week in nature report better health and a significantly greater sense of well-being (White et al., 2019). When it comes to the mental health benefits of nature, science suggests that the most efficient drop in cortisol happens between the 20-to-30-minute mark. Hence, it is recommended to prescribe at least a 20-minute (Hunter et al., 2019) outdoor activity at a time, for a total time of two to three hours per week spent in nature.

Who should prescribe nature? Any healthcare provider can prescribe nature. When people see a healthcare professional, their motivation to address a health problem is usually high. This is an excellent opportunity to promote healthy living since patients normally trust their healthcare providers. More specifically, nurses, physiotherapists, occupational therapists, respiratory therapists, midwives, kinesiologists, psychologists, social workers, pharmacists, and physicians can all encourage their patients to add contact with nature in their daily life as a healthy lifestyle habit.

Platforms available to prescribe. More and more nature prescription programs supported by health professionals have emerged around the world in recent years, intending to contribute positively to physical and psychological health through low-cost, easily accessible, nature-based solutions (Pétrin-Desrosiers, 2022).

In English-speaking Canada, Lem and her team at BC Parks Foundation worked hard to launch a nature prescription platform available for any healthcare provider willing to "improve their patient's health by connecting them to nature" (PaRx, 2023a, para. 1). "Each prescriber who registers with PaRx will receive a nature prescription file customized with a unique provider code, and instructions for how to prescribe and log nature prescriptions" (PaRx, 2023a, para. 2). Patients can also access special offers from partners to reduce their barriers to nature access across Canada (PaRx, 2023b). In Quebec, a team of six healthcare professionals have collaborated to offer the same kind of platform, but for French-speaking patients and prescribers (Prescri-Nature, 2023).

The limits of nature prescription. The main limiting factor identified in the deployment of natural prescribing programs is the limited time available to the health care professional (often the physician) during the consultation. The lack of time in the daily routine is also frequently cited by participants. Finally, some authors call for greater awareness, preparation, and training of the professionals involved. The existence of structured, known, and accessible programs, with a simple referral process, is named in several studies as a facilitating strategy (Pétrin-Desrosiers, 2022). For the participants, accessibility is a recurring theme in terms of limits of nature contact and it is expressed from several angles (financial, geographic, environmental, social, and cultural) (Pétrin-Desrosiers, 2022).

Support and guidance from a multidisciplinary team and the presence of a social network are other elements that recur in the studies analyzed (Pétrin-Desrosiers, 2022). The success of a prescription program depends on several elements, including the associated social network, the diversified offer of activities (adapted to age, personal or family life context, and interests), and the accessibility of spaces and activities (Pétrin-Desrosiers, 2022). There are a few articles that critically analyze the scientific literature on the topic of nature prescriptions and the research that is being conducted (Frumkin et al., 2017); (James et al., 2019). Both groups of authors demonstrate and reiterate the need for more research in this area.

Frumkin et al. (2017) identify seven areas of interest; for each, a series of questions and sub-questions are presented. The goal is to propose priority areas for research to fill existing gaps. For example, the first area identified is the study of mechanisms that can explain the impacts of nature on health: how does the observed reduction in stress influence other observed health benefits? Does physical activity in nature provide added benefits to physical activity in an artificial, built, or indoor environment? Other areas include exposure (how can it be measured?); health benefits; diversity and equity considerations (how do benefits vary by individual socioeconomic, ethnic, or another status?); the place of virtual nature (does virtual nature have the same health benefits?); economic and policy studies, including cost-benefit analyses; and finally, program implementation studies (which programs are most effective in adults, children, populations with specific diagnoses, etc.) (Pétrin-Desrosiers, 2022). Bragg & Atkins (2016) as well as James & al. (2019) also point out the importance of using a common and simplified vocabulary as to what is prescribed in nature, recognizing that the wide variability in terms used is not facilitating (Pétrin-Desrosiers, 2022).

Need for systemic and equitable actions

As mentioned at the beginning of this chapter, healthy lifestyle habits constitute a keystone for health, and contact with nature should be one of those habits to integrate into our lives. However, Bratman et al. note in a 2019 article that opportunities for nature-based experiences are diminishing in both quality and quantity for large num-

bers of people around the world due to land-use policies. These authors, therefore, propose a conceptual model for considering mental health as an ecosystem service. This model includes four key elements: the natural environment (type, size, qualities), exposure (proximity and time spent in nature variable), nature-related experience (interaction and "dose" variable), and characterization of mental health impacts. The authors conclude that there is a need to better equip stakeholders, including city planners, landscape architects, engineers, parks departments, developers, infrastructure providers, health professionals, community-based organizations, and environmental advocates to include the mental health benefits of natural spaces, particularly in an urban context from a socio-environmental justice perspective (Bratman et al., 2019).

Access to natural areas is not uniform and it is often the most socio-economically disadvantaged and/or racialized neighborhoods that have the least access. Hence, increasing the number of natural areas in our living environments is of paramount importance. As Alexander and Brooks recently add, equitable access to nature for all people is a research priority for improving population health (Alexander & Brooks, 2022).

References

Alexander, G. K., & Brooks, V. (2022). Nature-based therapeutics: A collaborative research agenda promoting equitable access and environmental stewardship. *Collegian*, *29*(1), 119-124.

Antonelli, M., Barbieri, G., & Donelli, D. (2019). Effects of forest bathing (shinrin-yoku) on levels of cortisol as a stress biomarker: a systematic review and meta-analysis. *International Journal of Biometeorology*, *63*(8), 1117-1134.

Astell-Burt, T., Feng, X., & Kolt, G. S. (2013). Does access to neighborhood green space promote a healthy duration of sleep? Novel findings from a cross-sectional study of 259 319 Australians. *British Medical Journal Open*, *3*(8), e003094.

Bastien, T. (2023, January 25). Pour que la prévention devienne un priorité. *La Presse +*. https://plus.lapresse.ca/screens/c631cadc-9954-4f21-a21e-2857a6e13fa0__7C___0.html

Bherer, L. (2021). Les bienfaits de la nature sur la santé globale. *SÉPAQ*, 1-15. https://www.sepaq.com/resources/docs/org/autres/org_icm_rapport_nature_sante_globale.pdf

Bratman, G. N., Anderson, C. B., Berman, M. G., Cochran, B., de Vries, S., Flanders, J., Folke, C., Frumkin, H., Gross, J. J., Hartig, T., Kahn, P. H., Kuo, M., Lawler, J. J., Levin, P. S., Lindahl, T., Meyer-Lindenberg, A., Mitchell, R., Ouyang, Z., Roe, J., . . . Daily, G. C. (2019). Nature and mental health: An ecosystem service perspective. *Science Advances*, *5*(7), eaax0903.

Chawla, L. (2015). Benefits of Nature Contact for Children. *Journal of Planning Literature*, *30*(4), 433-452.

Donovan, G. H., Gatziolis, D., Longley, I., & Douwes, J. (2018). Vegetation diversity protects against childhood asthma: results from a large New Zealand birth cohort. *Nature Plants*, *4*(6), 358-364.

Engemann, K., Pedersen, C. B., Arge, L., Tsirogiannis, C., Mortensen, P. B., & Svenning, J.-C. (2019). Residential green space in childhood is associated with a lower risk of psychiatric disorders from adolescence into adulthood. *Proceedings of the National Academy of Sciences*, *116*(11), 5188-5193.

Frumkin, H., Bratman, G. N., Breslow, S. J., Cochran, B., Kahn Jr, P. H., Lawler, J. J., Levin, P. S., Tandon, P. S., Varanasi, U., Wolf, K. L., & Wood, S. A. (2017). Nature Contact and Human Health: A Research Agenda. *Environmental Health Perspectives*, *125*(7), 1-18.

Guibert-Morin, C. (2021). *Mécanismes explicatifs des bienfaits du contact avec la nature : une étude qualitative* [Université de Sherbrooke]. https://savoirs.usherbrooke.ca/bitstream/handle/11143/18824/guibert_morin_camille_DPs_2021.pdf

Hunter, M. R., Gillespie, B. W., & Chen, S. Y.-P. (2019). Urban Nature Experiences Reduce Stress in the Context of Daily Life Based on Salivary Biomarkers [Original Research]. *Frontiers in Psychology*, *10*, 722.

Ideno, Y., Hayashi, K., Abe, Y., Ueda, K., Iso, H., Noda, M., Lee, J. S., & Suzuki, S. (2017). Blood pressure-lowering effect of Shinrin-yoku (Forest bathing): a systematic review and meta-analysis. *BMC Complementary and Alternative Medicine*, *17*(1), 409.

Ingunn, F., xf, & rtoft. (2004). Landscape as Playscape: The Effects of Natural Environments on Children's Play and Motor Development. *Children, Youth and Environments*, *14*(2), 21-44.

James, J. J., Christiana, R. W., & Battista, R. A. (2019). A historical and critical analysis of park prescriptions. *Journal of Leisure Research*, *50*(4), 311-329.

Jo, H., Song, C., & Miyazaki, Y. (2019). Physiological Benefits of Viewing Nature: A Systematic Review of Indoor Experiments. *International Journal of Environmental Research and Public Health*, *16*(23), 4739.

Kang, M.-J., Kim, H.-S., & Kim, J.-Y. (2022). Effects of Forest-Based Interventions on Mental Health: A Meta-Analysis of Randomized Controlled Trials. *International Journal of Environmental Research and Public Health*, *19*(8), 4884.

Kobayashi, H., Song, C., Ikei, H., Park, B. J., Lee, J., Kagawa, T., & Miyazaki, Y. (2018). Forest Walking Affects Autonomic Nervous Activity: A Population-Based Study. *Front Public Health*, *6*, 278.

Kotera, Y., Richardson, M., & Sheffield, D. (2022). Effects of Shinrin-Yoku (Forest Bathing) and Nature Therapy on Mental Health: a Systematic Review and Meta-analysis. *International Journal of Mental Health and Addiction*, *20*(1), 337-361.

Li, Q. (2022). Effects of forest environment (Shinrin-yoku/Forest bathing) on health promotion and disease prevention -the Establishment of "Forest Medicine". *Environmental Health and Preventative Medicine*, *27*, 43, 1-10.

Li, Q., Morimoto, K., Kobayashi, M., Inagaki, H., Katsumata, M., Hirata, Y., Hirata, K., Shimizu, T., Li, Y. J., Wakayama, Y., Kawada, T., Ohira, T., Takayama, N., Kagawa, T., & Miyazaki, Y. (2008). A forest bathing trip increases human natural killer activity and expression of anti-cancer proteins in female subjects. *Journal of Biological Regulators and Homeostatic Agents*, *22*(1), 45-55.

Matsuoka, R. H. (2010). Student performance and high school landscapes: Examining the links. *Landscape and Urban Planning*, *97*(4), 273-282.

Morita, E., Imai, M., Okawa, M., Miyaura, T., & Miyazaki, S. (2011). A before and after comparison of the effects of forest walking on the sleep of a community-based sample of people with sleep complaints. *BioPsychoSocial Medicine*, *5*(1), 1-7.

Ochiai, H., Ikei, H., Song, C., Kobayashi, M., Takamatsu, A., Miura, T., Kagawa, T., Li, Q., Kumeda, S., Imai, M., & Miyazaki, Y. (2015). Physiological and psychological effects of forest therapy on middle-aged males with high-normal blood pressure. *International Journal of Environmental Research and Public Health*, *12*(3), 2532-2542.

Park, B. J., Tsunetsugu, Y., Kasetani, T., Kagawa, T., & Miyazaki, Y. (2010). The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. *Environmental Health and Preventive Medicine*, *15*(1), 18-26.

PaRx. (2023a). A prescription for Nature: About. https://www.parkprescriptions.ca/en/about

PaRx. (2023b). A prescription for Nature: How it works. https://www.parkprescriptions.ca/en/how-it-works

Pelletier, É. (2022, 22 mars 2022). BUDGET 2022 | Près de 15 milliards$ de plus dépensés en santé à cause de la COVID-19. *Le Soleil*. https://www.lesoleil.com/2022/03/22/budget-2022--pres-de-15-milliards-de-plus-depenses-en-sante-a-

cause-de-la-covid-19-52299252d5f2448543c-7179b200ac073

Pétrin-Desrosiers, C. (2022). *Développement et déploiement de programmes de prescriptions en nature pour améliorer la santé physique et mentale: justificatif, efficacité, stratégies et freins*.

Prescri-Nature. (2023). À propos. https://www.prescri-nature.ca/

Pretty, J., Peacock, J., Sellens, M., & Griffin, M. (2005). The mental and physical health outcomes of green exercise. *International Journal of Environmental Health Research*, *15*(5), 319-337.

Reese, G., Stahlberg, J., & Menzel, C. (2022). Digital shinrin-yoku: do nature experiences in virtual reality reduce stress and increase well-being as strongly as similar experiences in a physical forest? *Virtual Reality*, *26*(3), 1245-1255.

Rook, G. A. (2013). Regulation of the immune system by biodiversity from the natural environment: An ecosystem service essential to health. *Proceedings of the National Academy of Sciences*, *110*(46), 18360-18367.

Sherwin, J. C., Reacher, M. H., Keogh, R. H., Khawaja, A. P., Mackey, D. A., & Foster, P. J. (2012). The association between time spent outdoors and myopia in children and adolescents: a systematic review and meta-analysis. *Ophthalmology*, *119*(10), 2141-2151.

St-Arnaud, P., & Bélanger, P. (2005). Co-création d'un espace-temps de guérison en territoire ancestral par et pour les membres d'une communauté autochtone au Québec : appréciation clinique d'une approche émergente et culturellement adaptée. *Drogues, Santé et Société*, *4*(2), 141-176.

Swinburn, B. A., Walter, L. G., Arroll, B., Tilyard, M. W., & Russell, D. G. (1998). The green prescription study: a randomized controlled trial of written exercise advice provided by general practitioners. *American Journal of Public Health*, *88*(2), 288-291.

Taylor, A. F., & Kuo, F. E. (2009). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders*, *12*(5), 402-409.

Tsunetsugu, Y., Lee, J., Park, B.-J., Tyrväinen, L., Kagawa, T., & Miyazaki, Y. (2013). Physiological and psychological effects of viewing urban forest landscapes assessed by multiple measurements. *Landscape and Urban Planning*, *113*, 90-93.

Twohig-Bennett, C., & Jones, A. (2018). The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes. *Environmental Research*, *166*, 628-637.

White, M. P., Alcock, I., Grellier, J., Wheeler, B. W., Hartig, T., Warber, S. L., Bone, A., Depledge, M. H., & Fleming, L. E. (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Scientific Reports*, *9*(1), 7730.

WHO. (2023a). *Constitution*. https://www.who.int/about/governance/constitution

WHO. (2023b). *Health and Well-being*. https://www.who.int/data/gho/data/major-themes/health-and-well-being

Yeon, P.-S., Jeon, J.-Y., Jung, M.-S., Min, G.-M., Kim, G.-Y., Han, K.-M., Shin, M.-J., Jo, S.-H., Kim, J.-G., & Shin, W.-S. (2021). Effect of Forest Therapy on Depression and Anxiety: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*, *18*(23), 12685.

Yi, J., Kim, S. G., Khil, T., Shin, M., You, J. H., Jeon, S., Park, G. H., Jeong, A. Y., Lim, Y., Kim, K., Kim, J., Kang, B., Lee, J., Park, J. H., Ku, B., Choi, J., Cha, W., Lee, H. J., Shin, C., . . . Kim, J. U. (2021). Psycho-Electrophysiological Benefits of Forest Therapies Focused on Qigong and Walking with Elderly Individuals. *International Journal of Environmental Research and Public Health*, *18*(6), 3004.