



Review

# Effect of Nature Space on Enhancing Humans' Health and Well-Being: An Integrative Narrative Review

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**Abstract:** With the progress of science and technology, humans' ability to transform and create has been greatly enhanced, but so have the physical and mental ailments associated with environmental degradation and urbanization. Human survival and health are strongly linked to nature, and there is growing evidence that exposure to nature promotes health and well-being. However, there is currently a lack of synthesis among empirical studies on these aspects for the findings to be sufficient for informing public health strategies and social policy. Here, following basic guidelines for systematic review and meta-analysis, we searched PubMed, Web of Science, ScienceDirect, and Scopus databases in January 2023. The results of our search and analysis show that nature can improve people's health and well-being from two aspects: physical (reduces CVDs, increases immunity, improves autonomic nervous system function, and improves sleep quality) and psychological (restores attention, improves mood, reduces stress, and improves cognitive development). The ways in which people derive health from nature are varied, and tailored, personalized, symptom-specific exposure can further increase the health benefits. More importantly, it seems that people can gain the health benefits of nature by only being exposed to it for a short time. We incorporate the existing scientific evidence in our review and develop a new heuristic point of view on the necessity of exposure to natural environments for the health of individuals.

**Keywords:** nature environment; ecosystem service; environmental psychology; mental health; physical health; nature exposure; nature connectedness



**Citation:** Zhang, Z.; Ye, B.; Yang, W.; Gao, Y. Effect of Nature Space on Enhancing Humans' Health and Well-Being: An Integrative Narrative Review. *Forests* **2024**, *15*, 100. <https://doi.org/10.3390/f15010100>

Academic Editors: Qing Li, Won Sop Shin and Christos Gallis

Received: 23 August 2023

Revised: 21 September 2023

Accepted: 25 September 2023

Published: 4 January 2024



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## 1. Introduction

As a consequence of industrialization and the development of an 'information' society, humans have developed the ability to transform nature and establish massive urban systems (e.g., megacities, urban agglomerations, etc.). According to the World Urbanization Prospects 2018, 55% of the world's population in 2018 resided in urban areas globally, with the share of urban dwellers projected to reach 68% by 2050 [1]. Significantly, in the World Urbanization Prospects 2014, these two estimates were, respectively, 54% and 66% [2]. These figures indicate that urbanization is intensifying, and one consequence will be fewer opportunities for engaging with nature [3]. Furthermore, with the acceleration of the pace of modern life, the environment is also changing. Energy sources, natural resources, and biodiversity are gradually becoming scarce; environmental pollution events are occurring more frequently; and the Earth's environment is generally suffering from the effects of high consumption in human society [4,5]. The incidence of cancer is increasing year by year, and a variety of difficult-to-treat diseases continue to appear. Both diseases with obvious symptoms and medically unexplained physical symptoms are gradually threatening people's physical and mental health [6,7].

The rise in novel health problems in industrialized societies has led researchers to increasingly scrutinize the effects of the natural environments on human health [8–11].

Researchers have explored how factors that promote human health vary in the natural environment across space and time [12,13]. In particular, the field of environmental medicine has focused on the effects of exposure to nature on improving physical and mental health [14–16]. The field of urban environmental studies has highlighted the importance of natural elements in urban infrastructure for more livable urban environments [17–20]. Research and subjective experience strongly support the idea that nature has net positive health benefits for humans [21–24]. These basic studies greatly affirm the importance of studying the relationship between nature and human health. Seeking health from nature is an important supplement or substitute for modern medicine. However, from our previous review, it was revealed that there is lingering uncertainty around (1) the characterization of benefits to human health from varied fields, and (2) how to maximize health benefits from nature.

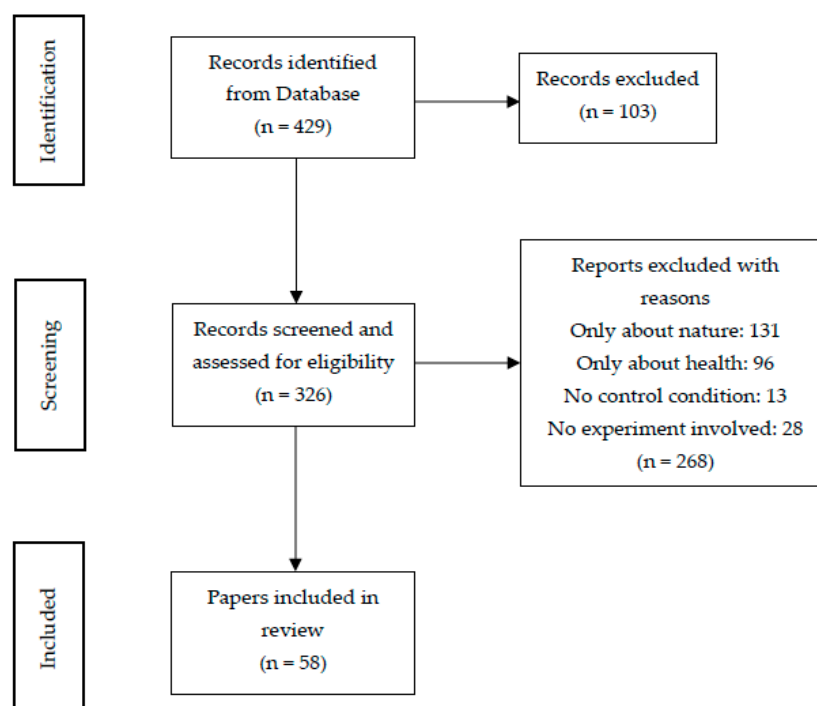
There is currently a lack of synthesis among empirical studies on these aspects for the findings to be sufficient for informing public health strategies and social policy. In order to more clearly show the multiple benefits of nature on human health and to determine the ways to maximize these benefits according to research evidence, a review study is needed to enrich the line of evidence pointing to the role of natural space in improving health and to establish a theoretical framework for future research in this field. Thus, in this study, we first synthesize evidence for the direct health and well-being benefits individuals can gain from nature, and then we discuss how to best build a ‘bridge’ connecting humans and nature so as to maximize health benefits. These results also have important implications for broader society in the way that individuals interact with nature, improve their ecological awareness, and protect the Earth we share together as a home.

## 2. Materials and Methods

We conducted this review to investigate the relationship between natural space and health and the ways to maximize its health benefits. Following the basic guidelines of systematic review and meta-analysis, we searched PubMed, Web of Science, ScienceDirect, and Scopus databases in January 2023. We restricted searches to the years ranging from January 1980 to December 2022.

We identified articles with the main search terms, including health (e.g., psychological, physiological, well-being, emotion, depression, and anxiety), natural space (e.g., nature, forest, green space, meadow, lake, etc.), and natural exposure (e.g., nature/forest bathing, shinrin-yoku, nature/forest therapy, nature/forest exposure, nature/forest connectedness, etc.). By searching for these terms independently or in combination, 429 articles were identified in the initial databases. We then removed non-English studies, which left 326 studies, and then potentially relevant papers were selected through the following procedure: (1) screening the titles, (2) screening the abstracts, and (3) retrieving and screening for full text when the abstract did not provide sufficient data or was not available, leaving 58 papers (Figure 1).

We recorded the location, years, sample size, population or sample characteristics, environmental exposure and control exposures, and health outcomes for each study. Due to the inconsistencies of most studies in study design (comparative experiments, questionnaires, etc.), exposure methods, comparison methods, statistical analysis, etc., the number of studies was too low to conduct a meta-analysis. Through our viewing and analysis, nature can improve people’s health and well-being from two aspects: physical (reductions in CVDs, increased immunity, improved autonomic nervous system function, and improved sleep quality) and psychological (restored attention, improved mood and reduced stress, and improved cognitive development).



**Figure 1.** Process of Studies Selection.

### 3. Results

#### 3.1. Health Benefits from Nature

##### 3.1.1. Physical Health

A growing number of studies have found beneficial physical health effects associated with human exposure to natural environments [8]. Benefits that have received relatively large amounts of research attention include reductions in cardiovascular diseases (CVDs), increased immunity, improved autonomic nervous system function, and improved sleep quality (Table 1).

**Table 1.** The physical benefits that human derive from nature.

Physical Benefits	The Role of Natural Environments in Preventing Illness	Physical Response Variables	Citations
Cardiovascular Disease (CVDs)	Exposure to natural environment has been shown to prevent CVDs.	Systolic blood pressure (SBP) Diastolic blood pressure (DBP) Pulse rate (PR)	Shanahan et al., 2016 [25] Rajoo et al., 2019 [26] Zeng et al., 2020 [27] Kabisch et al., 2021 [22]
Immunity	Natural environment can have positive effects on human immune system function.	NK activity and the number of NK cells The levels of intracellular granulysin, perforin, and granzymes A/B	Li et al., 2008 [28] Li et al., 2010 [29] Jia et al., 2016 [30] Lyu et al., 2019 [31]
Sympathetic nervous system function	Natural environments can regulate the sympathetic nervous system by providing free and soothing green spaces.	Salivary amylase Heart rate variability (HRV)	Yamaguchi et al., 2006 [32] Park et al., 2009 [33] Lee et al., 2014 [34] Ochiai et al., 2017 [35]
Sleep quality	When people are exposed to nature, insomnia symptoms can be alleviated without side effects.	Sleep characteristics Sleep time Self-rated depth of sleep Sleep efficiency Sleep quality	Morita et al., 2011 [36] Kim et al., 2019 [37] Li et al., 2022 [16]

### Cardiovascular Disease

Living in highly urbanized environments for prolonged periods may mean reduced exposure to open green and blue spaces, greater exposure to air and noise pollution, and urban heat island effects, all of which increase the risk of CVDs in older adults [22,38]. Globally, CVDs have become the leading cause of death, and the United Nations included reducing CVDs as part of the 2030 sustainable development goals [39]. CVD costs reached EUR 106 billion in 2009, accounting for about 9% of total healthcare expenditure in the European Union [40]. CVD risk is partially associated with social factors, including work stress, worry, life events, social disparities, and trauma [41]. As natural environments can help relieve stress, studies have found that prevention of CVDs via exposure to green space is cost-effective in many scenarios [42].

Recent evidence suggests that repeated ‘forest bathing’ has positive effects on patients with chronic heart failure (CHF) [43,44]. In almost all previous studies of environmental effects on CVDs, blood pressure and pulse rate (PR) are key predictive response variables [45]. One study in Leipzig, Germany, found significant decreases in systolic and pulse pressure in individuals within urban parks relative to those in a busy street environment [22]. Another study found that a three-day bamboo forest therapy session decreased systolic blood pressure (SBP) in university students [27]. Using a nature dose framework, Shanahan et al. [25] also found that people who visit green spaces have lower rates of high blood pressure. Another study found that PR, SBP and diastolic blood pressure (DBP) were significantly lower after a short period (2 h) of forest bathing [46]. A study examining the effects of a forest therapy program in Malaysia revealed that the SBP and DBP of participants remained significantly reduced 3 days and 5 days after treatment [26,47]. These studies strongly support the existence of a mechanistic link between natural environment exposure and reduction in CVDs.

### Immunity

The immune system helps the human body to resist viral invasions and maintain vivo stability [48]. However, the performance of the immune system can be affected by environmental factors, such as stressful work conditions and other situations that cause mental or emotional stress. Actively improving or relieving stressful environments can support human immune function and elicit cascading improvements in physical health.

Numerous studies have confirmed that the natural environment can have positive effects on human immune system function. These effects are mainly reflected in NK activity, the number of NK cells, and the levels of intracellular granzysin, perforin, and granzymes A/B. Li et al. [28,29] found that participants who experienced short forest bathing sessions had higher values of NK activity and elevated numbers of NK, granzysin-, perforin-, and granzymes A/B-expressing cells. Furthermore, the increased NK activity lasted for more than 30 days after the forest bathing [49]. Jia et al. [30] found that three-day forest trips for patients with chronic obstructive pulmonary disease (COPD) led to a significant decrease in the levels of intracellular perforin, granzyme B and pro-inflammatory cytokines. Following the same method, Lyu et al. [31] found that bamboo forest therapy significantly increased NK activity and the number of NK, perforin-, granzysin-, and granzyme A/B-expressing cells.

NK cells are recognized as a separate lymphocyte lineage [50]; as mentioned above, NK cells have played an important role in the studies of evaluating human immune function [51]. The positive effects of the natural environment on immune function have been well documented, and short-term forest bathing is recommended for adjunctive therapeutic benefits.

### Sympathetic Nervous System Function

The sympathetic nervous system mediates the physiological response of the human body to stress. The sympathetic and parasympathetic systems have opposite functions; generally, the parasympathetic system is enhanced during relaxation, whereas the sympathetic

system is enhanced under stress [35]. The sympathetic nervous system can be affected by lifestyle factors such as nervousness, anxiety, and overwork. Natural environments can regulate the sympathetic nervous system by providing free and soothing green spaces.

Using salivary amylase level as an indicator of human sympathetic nervous system activity, Yamaguchi et al. [32] found that sympathetic nervous system activity was reduced in healthy young people when exposed to a forest environment. Components of heart rate variability are frequently used together to approximate parasympathetic (high frequency, HF) and sympathetic nervous system activity (the low frequency/high frequency (LF/HF) or LF/(LF + HF) ratio) [34]. One study found that the sympathetic activity of subjects in a forest area was significantly lower than in an urban area. The study also found that the HF component tended to be higher in forest areas than in urban areas [33]. Similar results were found by Lee et al. [52], who found that forest bathing increased the parasympathetic activity and decreased sympathetic activity in patients relative to when they were exposed to an urban environment. Tsunetsugu et al. [53] also found higher parasympathetic activity and lower sympathetic activity for subjects in forested areas compared to urban locations. Interestingly, these effects of natural therapy on the nervous system have also been found in patients with CVDs and Spinal Cord Injuries (SCIs) [34,35].

### Sleep Quality

Poor sleep quality is a common problem that can harm the quality of life and overall health. One in four Americans develops insomnia each year, according to a University of Pennsylvania School of Medicine report [54]. Between 65% and 99% of fibromyalgia patients report poor sleep quality [55]. Considering that sleep disorders can not only be a consequence of medical illnesses but also a major driver of other illnesses, they can lead to potentially life-threatening symptoms if left untreated. Disturbed sleep is also associated with other mental illnesses, including cognitive dysfunction, attention deficit, stress, anxiety, and depression. Poor-quality sleep can severely affect daytime social and work performance and increase the risk of traffic accidents [56].

Various therapies are commonly used to treat insomnia, including behavioral therapy, psychotherapy, light therapy, and pharmacological therapy [54]. However, the adverse effects of drugs, such as the risks of cognitive impairment, parasomnias, and dementia, are frequently discussed by researchers [57,58]. When people are exposed to nature, insomnia symptoms can be alleviated without side effects. Morita et al. [36] found that two hours of forest walking improved sleep characteristics, actual sleep time, immobile minutes, self-rated depth of sleep, and sleep quality. Kim et al. [37] found that forest therapy increased the sleep efficiency of cancer patients from  $79.6\% \pm 6.8\%$  to  $88.8\% \pm 4.9\%$ . They also found that total sleep time increased from  $367.2 \pm 33.4$  min to  $398 \pm 33.8$  min. Li et al. [16] found that subjective sleep quality (feeling refreshed, recovery from fatigue) improved after a 3-day forest trip.

### 3.1.2. Mental Health

According to the World Health Organization's definition, mental health encompasses (i) the absence of mental illness and (ii) the presence of psychological well-being [10]. Mental disorders are a significant public health concern [59], and their prevalence has been linked to conditions such as increased work pressure and a disordered pace of life brought about by urbanization [60,61]. The costs of treating mental illness are very high due to both the medical cost of the disease and the corresponding social cost. Vigo et al. [62] estimated that the global burden of mental illness accounts for 32.4% of years lived with disability (YLDs) and 13.0% of disability-adjusted life-years (DALYs). In Australia, the societal costs of depression alone are estimated at AUD 12.6 billion per year [25]. A growing number of studies have demonstrated significant positive associations between exposure to nature and mental health outcomes [63–65]. Experience in nature has a restorative effect and reduces stress (Table 2).

**Table 2.** The mental benefits that humans derive from nature.

Mental Benefits	The Role of Natural Environments in Preventing Illness	Physical Response Variables	Citations
Attention	Natural areas away from the hustle of “city noise” provide beautiful scenery and fresh air which can help restore attention.	Perceived Restorativeness Scale (PRS)	Stevenson et al., 2018 [66] Yu et al., 2020 [67] Huang et al., 2021 [68]
Mood and stress	Walking or meditating in green spaces can improve mood and reduce stress.	Risk of mental illness Brain grey matter volume Urinary epinephrine and dopamine Profile of mood states (POMS)	Li et al., 2016 [69] Engemann et al., 2019 [64] Furuyashiki et al., 2019 [14] Kühn et al., 2021 [15]
Cognitive development	Exposure to natural environments has a positive impact on cognitive development.	Cognitive development test Short-term and overall memory performance	Lin and Van Stan II, 2020 [70] Asta et al., 2021 [71] Lega et al., 2021 [72] Maes et al., 2021 [11]

### Attention

The modern urban environment is information-rich and filled with distractions. The brain relies heavily on cognitive resources to ignore distractions and focus attention. However, this consumes large amounts of energy and over time will induce exhaustion [66]. Such long-term mental fatigue can directly or indirectly lead to health problems.

Natural areas away from the hustle of “city noise” provide beautiful scenery and fresh air, which can help restore attention. The restorative potential of nature can be explained by theories such as Stress Reduction Theory (SRT) [73,74] or Attention Restoration Theory (ART) [75]. SRT suggests that natural exposure reduces stress and reduces negative thoughts through a psycho-physiological pathway that promotes stress recovery. ART proposes that nature helps recover directed attention fatigue, which improves cognitive performance [3].

Many lines of evidence support these theories. For instance, a meta-analysis by Stevenson et al. [66] showed that attentional control was improved after exposure to natural environments, though the effect sizes were low to moderate. In a low-density area of Fuzhou, China, exposure to green space led to significant changes in subjects’ Perceived Restorativeness Scale (PRS). The study also found that landscapes with high plant species richness, water, rough terrain, cultural structures, and the absence of roadways were particularly effective for stress recovery and attention restoration [68]. In another study, place dependence and place identity were also landscape elements positively associated with restorative perceptions [76]. Recently, a study using virtual reality to simulate natural settings found that participants also expressed more perceived restorative value in virtual nature settings rather than in virtual urban settings [67].

### Mood and Stress

People born in urban environments have an increased risk of psychiatric disorders, mood disorders and personality disorders [77]. These health problems occur, in part, as a result of prolonged periods of depressed moods and high stress. Improving subjective mood and reducing stress are thus practical measures for reducing the risk of developing psychological problems in urban settings.

Previous studies have provided evidence that walking or meditating in green spaces can improve mood and reduce stress [78]. A study in Denmark found that high levels of exposure to green space during childhood were associated with a lower risk of psychiatric disorders later in life. Mental illness risk for those exposed to the least amount of green space during childhood was 55% higher than that of those exposed to the highest amount of green space [64]. In the UK, researchers found that the odds of a person experiencing a major depressive episode were 4.0% lower per interquartile increment in NDVI greenness [79]. Liu et al. [80] found that having a higher-than-average level of nature-connectedness

was associated with a 7% increase in feelings of worthwhileness, a 6.4% increase in life satisfaction, and a 2.5% decrease in depression risk.

Positive associations have also been observed between urban green spaces and brain physiology. For instance, Kühn et al. [15] found that exposure to urban green spaces predicted greater brain grey matter volume as revealed by brain imaging. Effects were particularly evident in the perigenual/subgenual anterior cingulate cortex, which has been negatively associated with depression. Other evidence-based research has supported nature's role in reducing stress and improving mood. For instance, urinary epinephrine and dopamine tended to decrease after a one-day forest walk, compared to those who walked in a city, suggesting that forest bathing had a relaxing effect [69]. In a study based in Hiroshima Prefecture, Japan, negative items in the profile of mood states (POMS) were significantly decreased in participants after forest bathing, and POMS differences between those with and without depression tendencies disappeared [14]. Elsadek et al. [81] found that walking along roads lined by woods reduced tension, fatigue, confusion and anxiety more than walking along roads with dense buildings. The same health benefits were also achieved in winter [82]. Interestingly, another study found that exposure to the natural light of medium-brightness in a virtual forest could significantly reduce participant stress compared to overly bright or overly dark conditions [83].

### Cognitive Development

Cognitive disorders typically impair learning, memory, perception–motor function, language, attention and problem solving [84]. Health problems caused by cognitive disorders are increasing in prevalence and are an important concern for civil society [85]. Contact with nature is thought to play an essential role in brain development. Thus, exposure to natural environments is likely to have a positive impact on cognitive development [9].

Many studies have linked exposure to natural environments with adolescents' cognitive development. For instance, a study in Rome showed that the level of greenness within 500 m of a residence was positively associated with cognitive development test scores for 7 year olds [71]. Lin and Van Stan II [70] found that tree canopy cover and percent water cover within a school attendance area were associated with higher mean science and social science scores, as well as proficiency level in social science. Another study found that greenness in the surrounding environment was associated with significantly better short-term and overall memory performance [72]. Maes et al. [11] found that greater daily exposure to woodland and blue space, but not grassland, was associated with higher scores for cognitive development in adolescents over time, using longitudinal data. Together, these studies strongly support the idea that woodlands and other natural environments are associated with improved adolescent cognition. Therefore, increasing tree canopy cover and aquatic environments in urban planning were suggested to improve students' academic performance and cognitive development [70].

### 3.2. Maximizing Health Benefits of Nature

Time spent in or near natural areas is clearly therapeutic, on the whole. Yet the benefits of nature are largely reaped only when people are able to physically experience a natural area. This leads to a question of how to maximize the health benefits of nature, given large urban populations and finite resources. The best option, on an individual level, involves entering nature, feeling nature, and being in nature. We believe that these interactions between humans and nature can be divided into concepts of nature exposure and nature connectedness.

#### 3.2.1. Nature Exposure

Nature exposure means spending time in a natural environment [86]. The viewpoint holds that health benefits can be obtained simply by going into nature. There are various ways to get such exposure, which can be roughly divided into two categories: going out into nature and bringing nature into our neighborhoods. Going out into nature involves entering natural areas and carrying out recreational activities like exercise, hiking, wildlife

watching, or just sitting and doing nothing [87]. Bringing nature to our neighborhood means incorporating more natural elements into our working and living spaces. These elements may include flowers or potted plants, posters of natural scenery, gardens and arbors.

The litany of research cited in this review highlights that regular exposure to nature can foster health and well-being [88]. Further findings suggest that people may not need to be exposed to forests for too long to gain health and well-being. For instance, one study in the UK confirmed that improvements in self-esteem and mood were observed after just five minutes of green exercise [89]. Besides, a dose-response analysis in Australia showed that visiting outdoor green spaces for at least 30 min during a week could reduce the prevalence of depression by up to 7% and 9%, respectively [25]. In addition, a survey study found that people's health and well-being would be significantly improved if they exposed to nature for more than 120 min per week [90].

### 3.2.2. Nature Connectedness

Nature connectedness refers to an individual's subjective feelings about his or her relationship to the natural world [80]. Nature connectedness is more of a psychological concept. It involves creating deep connections to nature through certain behaviors, such as placing oneself in nature and meditating on nature itself. This view proposes that simple exposure to nature is not sufficient to generate optimal health outcomes and that, instead, active, conscious engagement using all the senses is required. Under this view, those who have forged deep connections with nature will improve their health and well-being [87].

There are multiple ways for people to connect with nature. People can deeply feel nature subjectively through mindfulness, meditation, observation and other practices that integrate their mind into nature. Connections can also be built under the guidance of a therapist who will lead individuals through experiential activities such as crafts and exercises to semi-passively increase connections with nature. The ultimate aim of the nature connectedness mindset is to "create close connections with nature and feel nature more intimately".

## 4. Discussion

### 4.1. Health Benefits from Nature

As mentioned above, our summary review adds to the evidence that nature can promote health. This conclusion is consistent with our traditional understanding of nature and the ecological culture of most countries. Furthermore, this conclusion has been supported by a variety of theories, such as biophilia theory, SRT, ART, etc. Even though the existence of these effects was clear and adamant, it is worth our attention that the mechanisms by which nature improves well-being are still not entirely clear. That is to say, the connections between specific types of natural capital and specific health outcomes remain difficult to untangle. Meanwhile, it is undeniable that there are many substances in the natural environment that are not conducive to physical and mental health, such as pollens that cause allergies to the human body, wild animals and plants, and pathogens that are aggressive and harmful to people. The calls of certain animals and the wild environment with excessive density can also cause psychological tension in people. These questions will be the focus of future research.

### 4.2. Maximizing Health Benefits

Through our viewing, we highlight the health benefits that can be enhanced through a variety of activities. However, there is no unified guidance on the duration, frequency and intensity of exposure to nature needed for health benefits. According to our superficial understanding, in order to maximize the health benefits of nature, we recommend spending as much time in nature as frequently possible. So, how to explain the rationality and internal mechanism of this practice? We might as well offer an interpretation from deep ecology theory to explain that we human beings, as a species in nature, should not be above our separation from the natural ecosystem. Rather, it is more fruitful to conceptualize



ourselves as a node in the infinite network of natural things. When humans recognize their role as living creatures that are a part of nature and live in accordance with a “natural rhythm”, they will achieve physical and mental health. We consider nature as a “medicine” for obtaining physical and mental health. In other words, to be healthy, humans must recognize that we are part of nature and participants in the ecosystem rather than observers, in accordance with the laws of nature.

## 5. Conclusions

Nature can improve people’s health from two aspects: physical (reductions in CVDs, increased immunity, improved autonomic nervous system function, and improved sleep quality) and psychological (restored attention, improved mood and reduced stress, and improved cognitive development). The ways in which people derive health from nature (or interact with nature) are varied and, for the most part, beneficial. Nevertheless, tailored, personalized, symptom-specific exposure can further increase the health benefits. More importantly, it seems that people can obtain health benefits through exposure to nature for a short time. However, the mechanisms by which nature improves well-being are still not entirely clear, and no clear causal link has been established between natural substances and specific health benefits. At the same time, the minimum exposure time required to obtain health has not been quantitatively studied. Furthermore, the beneficial and harmful substances in nature also deserve further research in the future.

**Author Contributions:** Z.Z. and B.Y. contributed the conception and supervision. Z.Z. wrote the first draft of the manuscript. W.Y. and Y.G. reviewed the literature. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research work was funded by the Research Development Funds for RIFPI “Empirical study on the effect of forest activities on decompression” (5000103-6019) and the Fundamental Research Funds for CAF (CAFYBB2019ZC008).

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## References

1. United Nations. *World Urbanization Prospects 2018 Highlights*; United Nations: New York, NY, USA, 2019.
2. United Nations. *World Urbanization Prospects: The 2014 Revision: Highlights*; United Nations: New York, NY, USA, 2014.
3. Jones, M.V.; Gidlow, C.J.; Hurst, G.; Masterson, D.; Smith, G.; Ellis, N.; Clark-Carter, D.; Tarvainen, M.P.; Braithwaite, E.C.; Nieuwenhuijsen, M. Psycho-physiological responses of repeated exposure to natural and urban environments. *Landsc. Urban Plan.* **2021**, *209*, 104061. [[CrossRef](#)]
4. Watts, N.; Adger, W.N.; Agnolucci, P.; Blackstock, J.; Byass, P.; Cai, W.; Chaytor, S.; Colbourn, T.; Collins, M.; Cooper, A.; et al. Health and climate change: Policy responses to protect public health. *Lancet* **2015**, *386*, 1861–1914. [[CrossRef](#)] [[PubMed](#)]
5. Wang, H.; Wang, G.; Gu, W. Macroalgal blooms caused by marine nutrient changes resulting from human activities. *J. Appl. Ecol.* **2020**, *57*, 766–776. [[CrossRef](#)]
6. Giles-Corti, B.; Vernez-Moudon, A.; Reis, R.; Turrell, G.; Dannenberg, A.L.; Badland, H.; Foster, S.; Lowe, M.; Sallis, J.F.; Stevenson, M.; et al. City planning and population health: A global challenge. *Lancet* **2016**, *388*, 2912–2924. [[CrossRef](#)] [[PubMed](#)]
7. Lee, K.H.; Low, L.L.; Lu, S.Y.; Lee, C.E. Implementation of social prescribing: Lessons learnt from contextualising an intervention in a community hospital in Singapore. *Lancet Reg. Health West. Pac.* **2022**, *8*, 100561. [[CrossRef](#)] [[PubMed](#)]
8. Hartig, T.; Mitchell, R.; de Vries, S.; Frumkin, H. Nature and Health. *Annu. Rev. Public Health* **2014**, *35*, 207–228. [[CrossRef](#)] [[PubMed](#)]
9. Dadvand, P.; Nieuwenhuijsen, M.J.; Esnaola, M.; Forn, J.; Basagaña, X.; Alvarez-Pedrerol, M.; Rivas, I.; López-Vicente, M.; De Castro Pascual, M.; Su, J.; et al. Green spaces and cognitive development in primary schoolchildren. *Proc. Natl. Acad. Sci. USA* **2015**, *112*, 7937–7942. [[CrossRef](#)] [[PubMed](#)]
10. 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.; et al. Nature and mental health: An ecosystem service perspective. *Sci. Adv.* **2019**, *5*, eaax0903. [[CrossRef](#)]
11. Maes, M.J.A.; Pirani, M.; Booth, E.R.; Shen, C.; Milligan, B.; Jones, K.E.; Toledano, M.B. Benefit of woodland and other natural environments for adolescents’ cognition and mental health. *Nat. Sustain.* **2021**, *4*, 851–858. [[CrossRef](#)]
12. Nowak, D.J.; Hirabayashi, S.; Bodine, A.; Greenfield, E. Tree and forest effects on air quality and human health in the United States. *Environ. Pollut.* **2014**, *193*, 119–129. [[CrossRef](#)]

13. Nowak, D.J.; Hirabayashi, S.; Doyle, M.; McGovern, M.; Pasher, J. Air pollution removal by urban forests in Canada and its effect on air quality and human health. *Urban For. Urban Green.* **2018**, *29*, 40–48. [[CrossRef](#)]
14. Furuyashiki, A.; Tabuchi, K.; Norikoshi, K.; Kobayashi, T.; Oriyama, S. A comparative study of the physiological and psychological effects of forest bathing (Shinrin-yoku) on working age people with and without depressive tendencies. *Environ. Health Prev. Med.* **2019**, *24*, 46. [[CrossRef](#)] [[PubMed](#)]
15. Kühn, S.; Düzel, S.; Mascherek, A.; Eibich, P.; Krekel, C.; Kolbe, J.; Goebel, J.; Gallinat, J.; Wagner, G.G.; Lindenberger, U. Urban green is more than the absence of city: Structural and functional neural basis of urbanicity and green space in the neighbourhood of older adults. *Landsc. Urban Plan.* **2021**, *21*, 104196. [[CrossRef](#)]
16. Li, Q.; Ochiai, H.; Ochiai, T.; Takayama, N.; Kumeda, S.; Miura, T.; Aoyagi, Y.; Imai, M. Effects of forest bathing (shinrin-yoku) on serotonin in serum, depressive symptoms and subjective sleep quality in middle-aged males. *Environ. Health Prev. Med.* **2022**, *27*, 44. [[CrossRef](#)] [[PubMed](#)]
17. Suppakittpaisarn, P.; Jiang, B.; Slavenas, M.; Sullivan, W.C. Does density of green infrastructure predict preference? *Urban For. Urban Green.* **2019**, *40*, 236–244. [[CrossRef](#)]
18. Wang, R.; Helbich, M.; Yao, Y.; Zhang, J.; Liu, P.; Yuana, Y.; Liu, Y. Urban greenery and mental wellbeing in adults: Cross-sectional mediation analyses on multiple pathways across different greenery measures. *Environ. Res.* **2019**, *176*, 108535. [[CrossRef](#)]
19. Enssle, F.; Kabisch, N. Urban green spaces for the social interaction, health and well-being of older people—An integrated view of urban ecosystem services and socio-environmental justice. *Environ. Sci. Policy* **2020**, *109*, 36–44. [[CrossRef](#)]
20. Koohsari, M.J.; Yasunaga, A.; McCormack, G.R.; Shibata, A.; Ishii, K.; Nakaya, T.; Hanibuchi, T.; Nagai, Y.; Oka, K. Depression among middle-aged adults in Japan: The role of the built environment design. *Landsc. Urban Plan.* **2023**, *231*, 104651. [[CrossRef](#)]
21. Schinasi, L.H.; Benmarhnia, T.; De Roos, A.J. Modification of the association between high ambient temperature and health by urban microclimate indicators: A systematic review and meta-analysis. *Environ. Res.* **2018**, *161*, 168–180. [[CrossRef](#)]
22. Kabisch, N.; Püffel, C.; Masztalerz, O.; Hemmerling, J.; Kraemer, R. Physiological and psychological effects of visits to different urban green and street environments in older people: A field experiment in a dense inner-city area. *Landsc. Urban Plan.* **2021**, *207*, 103998. [[CrossRef](#)]
23. Kondo, M.C.; Fluehr, J.M.; Mckeon, T.; Branas, C.C. Urban green space and its impact on human health. *Int. J. Environ. Res. Public Health* **2018**, *15*, 445. [[CrossRef](#)]
24. Wan, S.; Rojas-Rueda, D.; Pretty, J.; Roscoe, C.; James, P.; Ji, J.S. Greenspace and mortality in the U.K. Biobank: Longitudinal cohort analysis of socio-economic, environmental, and biomarker pathways. *SSM Popul. Health* **2022**, *19*, 101194. [[CrossRef](#)] [[PubMed](#)]
25. Shanahan, D.F.; Bush, R.; Gaston, K.J.; Lin, B.B.; Dean, J.; Barber, E.; Fuller, R.A. Health Benefits from Nature Experiences Depend on Dose. *Sci. Rep.* **2016**, *6*, 28551. [[CrossRef](#)]
26. Rajoo, K.S.; Karam, D.S.; Aziz, N. Developing an effective forest therapy program to manage academic stress in conservative societies: A multi-disciplinary approach. *Urban For. Urban Green.* **2019**, *43*, 126353. [[CrossRef](#)]
27. Zeng, C.; Lyu, B.; Deng, S.; Yu, Y.; Li, N.; Lin, W.; Li, D.; Chen, Q. Benefits of a Three-Day Bamboo Forest Therapy Session on the Physiological Responses of University Students. *Int. J. Environ. Res. Public Health* **2020**, *17*, 3238. [[CrossRef](#)] [[PubMed](#)]
28. Li, Q.; Morimoto, K.; Kobayashi, M.; Inagaki, H.; Katsumata, M.; Hirata, Y.; Hirata, K.; Shimizu, T.; Li, Y.J.; Wakayama, Y.; et al. A forest bathing trip increases human natural killer activity and expression of anti-cancer proteins in female subjects. *J. Biol. Regul. Homeost. Agents* **2008**, *22*, 45–55. [[PubMed](#)]
29. Li, Q.; Kobayashi, M.; Inagaki, H.; Hirata, Y.; Li, Y.J.; Hirata, K.; Shimizu, T.; Suzuki, H.; Katsumata, M.; Wakayama, Y.; et al. A day trip to a forest park increases human natural killer activity and the expression of anti-cancer proteins in male subjects. *J. Biol. Regul. Homeost. Agents* **2010**, *24*, 157–165.
30. Jia, B.B.; Yang, Z.X.; Mao, G.X.; Lyu, Y.D.; Wen, X.L.; Xu, W.H.; Lyu, X.L.; Cao, Y.B.; Wang, G.F. Health effect of forest bathing trip on elderly patients with chronic obstructive pulmonary disease. *Biomed. Environ. Sci.* **2016**, *29*, 212–218.
31. Lyu, B.; Zeng, C.; Xie, S.; Li, D.; Lin, W.; Li, N.; Jiang, M.; Liu, S.; Chen, Q. Benefits of A Three-Day Bamboo Forest Therapy Session on the Psychophysiology and Immune System Responses of Male College Students. *Int. J. Environ. Res. Public Health* **2019**, *16*, 4991. [[CrossRef](#)]
32. Yamaguchi, M.; Deguchi, M.; Miyazaki, Y. The effects of exercise in forest and urban environments on sympathetic nervous activity of normal young adults. *J. Int. Med. Res.* **2006**, *34*, 151–159. [[CrossRef](#)]
33. Park, B.-J.; Tsunetsugu, Y.; Kasetani, T.; Morikawa, T.; Kagawa, T.; Miyazaki, Y. Physiological effects of forest recreation in a young conifer forest in Hinokage Town, Japan. *Silva Fenn.* **2009**, *43*, 291–301. [[CrossRef](#)]
34. Lee, J.; Tsunetsugu, Y.; Takayama, N.; Park, B.-J.; Li, Q.; Song, C.; Komatsu, M.; Ikei, H.; Tyrväinen, L.; Kagawa, T.; et al. Influence of Forest Therapy on Cardiovascular Relaxation in Young Adults. *Evid.-Based Complement. Altern. Med.* **2014**, *2*, 834360. [[CrossRef](#)] [[PubMed](#)]
35. Ochiai, H.; Song, C.; Ikei, H.; Imai, M.; Miyazaki, Y. Effects of Visual Stimulation with Bonsai Trees on Adult Male Patients with Spinal Cord Injury. *Int. J. Environ. Res. Public Health* **2017**, *14*, 1017. [[CrossRef](#)] [[PubMed](#)]
36. Morita, E.; Imai, M.; Okawa, M.; Miyaura, T.; Miyazaki, S. A before and after comparison of the effects of forest walking on the sleep of a community based sample of people with sleep complaints. *BioPsychoSoc. Med.* **2011**, *5*, 13. [[CrossRef](#)] [[PubMed](#)]
37. Kim, H.; Lee, Y.W.; Ju, H.J.; Jang, B.J.; Kim, Y.I. An Exploratory Study on the Effects of Forest Therapy on Sleep Quality in Patients with Gastrointestinal Tract Cancers. *Int. J. Environ. Res. Public Health* **2019**, *16*, 2449. [[CrossRef](#)]

38. Zock, J.-P.; Verheij, R.; Helbich, M.; Volker, B.; Spreeuwenberg, P.; Strak, M.; Janssen, N.A.; Dijst, M.; Groenewegen, P. The impact of social capital, land use, air pollution and noise on individual morbidity in Dutch neighbourhoods. *Environ. Int.* **2018**, *121*, 453–460. [[CrossRef](#)] [[PubMed](#)]
39. Campbell, N.R.; Ordunez, P.; Giraldo, G.; Morales, Y.; Varghese, C. WHO HEARTS: A global program to reduce cardiovascular disease burden: Experience implementing in the America's and opportunities in Canada. *Can. J. Cardiol.* **2020**, *37*, 744–755. [[CrossRef](#)]
40. Piepoli, M.F.; Hoes, A.W.; Agewall, S.; Albus, C.; Brotons, C.; Catapano, A.L.; Cooney, M.-T.; Corrà, U.; Cosyns, B.; Deaton, C.; et al. 2016 European Guidelines on cardiovascular disease prevention in clinical practice. *Atherosclerosis* **2016**, *252*, 207–274. [[CrossRef](#)]
41. Jiang, B.; Chen, J.; Wang, L. Cardiovascular Diseases Due to Stress Arisen from Social Risk Factors: A Synopsis and Prospectiveness. *Nano Life* **2018**, *8*, 1840003. [[CrossRef](#)]
42. Orioli, R.; Antonucci, C.; Scortichini, M.; Cerza, F.; Marando, F.; Ancona, C.; Manes, F.; Davoli, M.; Michelozzi, P.; Forastiere, F.; et al. Exposure to Residential Greenness as a Predictor of Cause-Specific Mortality and Stroke Incidence in the Rome Longitudinal Study. *Environ. Health Perspect.* **2019**, *127*, 027002. [[CrossRef](#)]
43. Wu, Q.; Cao, Y.; Mao, G.; Wang, S.; Fang, Y.; Tong, Q.; Huang, Q.; Wang, B.; Yan, J.; Wang, G. Effects of forest bathing on plasma endothelin-1 in elderly patients with chronic heart failure: Implications for adjunctive therapy. *Geriatr. Gerontol. Int.* **2017**, *17*, 2627–2629. [[CrossRef](#)] [[PubMed](#)]
44. Mao, G.X.; Cao, Y.B.; Yang, Y.; Chen, Z.M.; Dong, J.H.; Chen, S.S.; Wu, Q.; Lyu, X.L.; Jia, B.B.; Yan, J.; et al. Additive Benefits of Twice Forest Bathing Trips in Elderly Patients with Chronic Heart Failure. *Biomed. Environ. Sci.* **2018**, *31*, 159–162. [[PubMed](#)]
45. Rajoo, K.S.; Karam, D.S.; Abdullah, M.Z. The Physiological and Psychosocial Effects of Forest Therapy: A Systematic Review. *Urban For. Urban Green.* **2020**, *54*, 126744. [[CrossRef](#)]
46. Yu, C.-P.; Lin, C.-M.; Tsai, M.-J.; Tsai, Y.-C.; Chen, C.-Y. Effects of Short Forest Bathing Program on Autonomic Nervous System Activity and Mood States in Middle-Aged and Elderly Individuals. *Int. J. Environ. Res. Public Health* **2017**, *14*, 897. [[CrossRef](#)] [[PubMed](#)]
47. Rajoo, K.S.; Daljit, S.K.; Wook, N.-F.; Abdullah, M.-Z. Forest Therapy: An environmental approach to managing stress in middle-aged working women. *Urban For. Urban Green.* **2020**, *55*, 126853. [[CrossRef](#)]
48. Rook, G.A.W.; Lowry, C.A.; Raionc, C.L. Hygiene and other early childhood influences on the subsequent function of the immune system. *Brain Res.* **2015**, *1617*, 47–62. [[CrossRef](#)] [[PubMed](#)]
49. Li, Q. Effect of forest bathing trips on human immune function. *Environ. Health Prev. Med.* **2010**, *15*, 9–17. [[CrossRef](#)] [[PubMed](#)]
50. Vivier, E.; Tomasello, E.; Baratin, M.; Walzer, T.; Ugolini, S. Functions of natural killer cells. *Nat. Immunol.* **2008**, *9*, 503–510. [[CrossRef](#)]
51. Han, J.-W.; Choi, H.; Jeon, Y.-H.; Yoon, C.-H.; Woo, J.-M.; Kim, W. The Effects of Forest Therapy on Coping with Chronic Widespread Pain: Physiological and Psychological Differences between Participants in a Forest Therapy Program and a Control Group. *Int. J. Environ. Res. Public Health* **2016**, *13*, 255. [[CrossRef](#)]
52. Lee, J.; Park, B.-J.; Tsunetsugu, Y.; Ohira, T.; Kagawa, T.; Miyazaki, Y. Effect of forest bathing on physiological and psychological responses in young Japanese male subjects. *Public Health* **2011**, *125*, 93–100. [[CrossRef](#)]
53. Tsunetsugu, Y.; Lee, J.; Park, B.-J.; Tyrväinen, L.; Kagawa, T.; Miyazaki, Y. Physiological and psychological effects of viewing urban forest landscapes assessed by multiple measurements. *Landsc. Urban Plan.* **2013**, *113*, 90–93. [[CrossRef](#)]
54. Woo, J.; Yang, H.; Yoon, M.; Gadhe, C.G.; Pae, A.N.; Cho, S.; Lee, C.J. 3-Carene, a Phytoncide from Pine Tree Has a Sleep-enhancing Effect by Targeting the GABAA-benzodiazepine Receptors. *Exp. Neurol.* **2019**, *28*, 593–601. [[CrossRef](#)] [[PubMed](#)]
55. Climent-Sanz, C.; Marco-Mitjavila, A.; Pastells-Peiró, R.; Valenzuela-Pascual, F.; Blanco-Blanco, J.; Gea-Sánchez, M. Patient reported outcome measures of sleep quality in fibromyalgia: A COSMIN systematic review. *Int. J. Environ. Res. Public Health* **2020**, *17*, 2992. [[CrossRef](#)]
56. Fabbri, M.; Beracci, A.; Martoni, M.; Meneo, D.; Tonetti, L.; Natale, V. Measuring subjective sleep quality: A review. *Int. J. Environ. Res. Public Health* **2021**, *18*, 1082. [[CrossRef](#)] [[PubMed](#)]
57. Sateia, M.J.; Buysse, D.J.; Krystal, A.D.; Neubauer, D.N. Adverse Effects of Hypnotic Medications. *J. Clin. Sleep Med.* **2017**, *13*, 839. [[CrossRef](#)] [[PubMed](#)]
58. James, W. Hypnotics and the Risks of Dementia. *J. Clin. Sleep Med.* **2017**, *13*, 837. [[CrossRef](#)] [[PubMed](#)]
59. Sui, Y.; Ettema, D.; Helbich, M. Longitudinal associations between the neighborhood social, natural, and built environment and mental health: A systematic review with meta-analyses. *Health Place* **2022**, *77*, 102893. [[CrossRef](#)] [[PubMed](#)]
60. Hartig, T.; Kahn, P.H., Jr. Living in cities, naturally. *Science* **2016**, *352*, 938–940. [[CrossRef](#)]
61. Cox, D.; Hudson, H.L.; Shanahan, D.F.; Fuller, R.A.; Gaston, K.J. The rarity of direct experiences of nature in an urban population. *Landsc. Urban Plan.* **2017**, *160*, 79–84. [[CrossRef](#)]
62. Vigo, D.; Thornicroft, G.; Atun, R. Estimating the true global burden of mental illness. *Lancet Psychiatry* **2016**, *3*, 171–178. [[CrossRef](#)]
63. Barnes, M.R.; Donahue, M.L.; Keeler, B.L.; Shorb, C.M.; Mohtadi, T.Z.; Shelby, L.J. Characterizing nature and participant experience in studies of nature exposure for positive mental health: An integrative review. *Front. Psychol.* **2019**, *9*, 2617. [[CrossRef](#)] [[PubMed](#)]
64. Engemann, K.; Pedersen, C.B.; Arge, L.; Tsirogiannis, C.; Mortensen, P.B.; Svenning, J.-C. Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. *Proc. Natl. Acad. Sci. USA* **2019**, *116*, 5188–5193. [[CrossRef](#)] [[PubMed](#)]

65. Guo, Y.; Liu, Y.; Lu, S.; Chan, O.F.; Chui, C.H.K.; Lum, T.Y.S. Objective and perceived built environment, sense of community, and mental wellbeing in older adults in Hong Kong: A multilevel structural equation study. *Landsc. Urban Plan.* **2021**, *209*, 104058. [[CrossRef](#)]
66. Stevenson, M.P.; Theresa, S.; Peter, B. Attention Restoration Theory II: A systematic review to clarify attention processes affected by exposure to natural environments. *J. Toxicol. Environ. Health Part B* **2018**, *21*, 227–268. [[CrossRef](#)] [[PubMed](#)]
67. Yu, C.-P.; Lee, H.Y.; Lu, W.H.; Huang, Y.-C.; Browning, M.H.E.M. Restorative effects of virtual natural settings on middle-aged and elderly adults. *Urban For. Urban Green.* **2020**, *56*, 126863. [[CrossRef](#)]
68. Huang, S.; Qi, J.; Li, W.; Dong, J.; van den Bosch, C.K. The Contribution to Stress Recovery and Attention Restoration Potential of Exposure to Urban Green Spaces in Low-Density Residential Areas. *Int. J. Environ. Res. Public Health* **2021**, *18*, 8713. [[CrossRef](#)]
69. Li, Q.; Kobayashi, M.; Kumeda, S.; Ochiai, T.; Miura, T.; Kagawa, T.; Imai, M.; Wang, Z.; Otsuka, T.; Kawada, T. Effects of forest bathing on cardiovascular and metabolic parameters in middle-aged males. *Evid.-Based Complement. Altern. Med.* **2016**, *2016*, 2587381. [[CrossRef](#)]
70. Lin, M.; Van Stan, J.T., II. Impacts of urban landscapes on students' academic performance. *Landsc. Urban Plan.* **2020**, *201*, 103840. [[CrossRef](#)]
71. Asta, F.; Michelozzi, P.; Cesaroni, G.; De Sario, M.; Davoli, M.; Porta, D. Green spaces and cognitive development at age 7 years in a rome birth cohort: The mediating role of nitrogen dioxide. *Environ. Res.* **2021**, *196*, 110358. [[CrossRef](#)]
72. Lega, C.; Gidlow, C.; Jones, M.; Ellis, N.; Hurst, G. The relationship between surrounding greenness, stress and memory. *Urban For. Urban Green.* **2021**, *59*, 126974. [[CrossRef](#)]
73. Ulrich, R.S. View through a window may influence recovery from surgery. *Science* **1984**, *224*, 420–422. [[CrossRef](#)] [[PubMed](#)]
74. Ulrich, R.S.; Simons, R.F.; Losito, B.D.; Fiorito, E.; Miles, M.A.; Zelson, M. Stress recovery during exposure to natural and urban environments. *J. Environ. Psychol.* **1991**, *11*, 201–230. [[CrossRef](#)]
75. Kaplan, R.; Kaplan, S. *The Experience of Nature: A Psychological Perspective*. Cambridge University Press: Cambridge, UK, 1989.
76. Liu, Q.; Wu, Y.; Xiao, Y.; Fu, W.; Zhuo, Z.; van den Bosch, C.C.K.; Huang, Q.; Lan, S. More meaningful, more restorative? Linking local landscape characteristics and place attachment to restorative perceptions of urban park visitors. *Landsc. Urban Plan.* **2020**, *197*, 103763. [[CrossRef](#)]
77. Vassos, E.; Agerbo, E.; Mors, O.; Pedersen, C.B. Urban-rural differences in incidence rates of psychiatric disorders in Denmark. *Br. J. Psychiatry* **2016**, *208*, 435–440. [[CrossRef](#)] [[PubMed](#)]
78. Bray, I.; Reece, R.; Sinnett, D.; Martin, F.; Hayward, R. Exploring the role of exposure to green space in preventing anxiety and depression among young people aged 14–24 living in urban settings: A systematic review and conceptual framework. *Environ. Res.* **2022**, *214*, 114081. [[CrossRef](#)] [[PubMed](#)]
79. Sarkar, C.; Webster, C.; Gallacher, J. Residential greenness and prevalence of major depressive disorders: A cross-sectional, observational, associational study of 94879 adult UK Biobank participants. *Lancet Planet. Health* **2018**, *2*, e162–e173. [[CrossRef](#)] [[PubMed](#)]
80. Liu, H.; Nong, H.; Ren, H.; Liu, K. The effect of nature exposure, nature connectedness on mental well-being and ill-being in a general Chinese population. *Landsc. Urban Plan.* **2022**, *222*, 104397. [[CrossRef](#)]
81. Elsadek, M.; Liu, B.; Lian, Z.; Xie, J. The influence of urban roadside trees and their physical environment on stress relief measures: A field experiment in Shanghai. *Urban For. Urban Green.* **2019**, *42*, 51–60. [[CrossRef](#)]
82. Bielinis, E.; Takayama, N.; Boiko, S.; Omelan, A.; Bielinis, L. The effect of winter forest bathing on psychological relaxation of young Polish adults. *Urban For. Urban Green.* **2018**, *29*, 276–283. [[CrossRef](#)]
83. Li, C.; Sun, C.; Sun, M.; Yuan, Y.; Li, P. Effects of brightness levels on stress recovery when viewing a virtual reality forest with simulated natural light. *Urban For. Urban Green.* **2020**, *56*, 126865. [[CrossRef](#)]
84. Robbins, R.N.; Scott, T.; Joska, J.A.; Gouse, H. Impact of urbanization on cognitive disorders. *Curr. Opin. Psychiatry* **2019**, *32*, 210–217. [[CrossRef](#)] [[PubMed](#)]
85. Sachdev, P.S.; Lipnicki, D.M.; Kochan, N.A.; Crawford, J.D.; Thalamuthu, A.; Andrews, G.; Brayne, C.; Matthews, F.E.; Stephan, B.C.M.; Lipton, R.B.; et al. The Prevalence of Mild Cognitive Impairment in Diverse Geographical and Ethnocultural Regions: The COSMIC Collaboration. *PLoS ONE* **2015**, *10*, e0142388. [[CrossRef](#)] [[PubMed](#)]
86. Bratman, G.N.; Hamilton, J.P.; Daily, G.C. The impacts of nature experience on human cognitive function and mental health. *Ann. New York Acad. Sci.* **2012**, *1249*, 118–136. [[CrossRef](#)] [[PubMed](#)]
87. McGeeney, A. *With Nature in Mind: The Ecotherapy Manual for Mental Health Professionals*; Jessica Kingsley Publishers: London, UK, 2016.
88. Lucini, D.; Pagani, M. Exercise Prescription to Foster Health and Well-Being: A Behavioral Approach to Transform Barriers into Opportunities. *Int. J. Environ. Res. Public Health* **2021**, *19*, 968. [[CrossRef](#)]
89. Barton, J.O.; Pretty, J. What is the best dose of nature and green exercise for improving mental health? A multi-study analysis. *Environ. Sci. Technol.* **2010**, *44*, 3947–3955. [[CrossRef](#)]
90. White, M.P.; Alcock, I.; Grellier, J.; Wheeler, B.W.; Hartig, T.; Warber, S.L.; Bone, A.; Depledge, M.H.; Fleming, L.E. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Sci. Rep.* **2019**, *9*, 7730. [[CrossRef](#)]

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