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Nature-Based Intervention Approaches in Psychiatry

Psikiyatride Doğa Temelli Müdahale Yaklaşımları

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ABSTRACT

This study explores the therapeutic value of nature-based intervention methods in psychiatry through an assessment of their practical applications, action mechanisms, and conceptual development. The conceptual framework is based on discussions of emerging psychological constructs such as eco-anxiety, ecological grief, and solastalgia, which have arisen as a result of climate change. The study reviews the psychiatric effects of horticultural therapy, forest bathing, community gardening, and mindfulness-based nature practices. The findings indicate that horticultural therapy helps patients with depression and anxiety and improves their attention, forest bathing decreases cortisol levels and boosts immunity and sleep quality, community gardening reduces social isolation and creates feelings of belonging, and mindfulness-based nature practices help people manage stress and develop self-awareness. They further demonstrate that nature-based practices support both personal mental health and the creation of enduring mental health policies. However, evidence on the long-term effects of these interventions and their adaptability to different cultural contexts is limited. Standardized assessment tools are lacking in this field, which creates challenges for the comparison of different research findings. To integrate nature-based interventions into clinical practice, structural policy changes and professional development training are both needed, together with the establishment of ecologically sensitive protocols and policy arrangements that encourage interdisciplinary collaboration.

Keywords: Ecology, climate change, mental health

ÖZ

Bu çalışma, doğa temelli müdahale yaklaşımlarının psikiyatrideki terapötik potansiyelini; klinik kullanım alanları, etki mekanizmaları ve kavramsal gelişim bağlamında değerlendirmeyi amaçlamaktadır. İklim değişikliğiyle ilişkili olarak artan çevresel kaygı biçimleri olan eko-anksiyete, ekolojik yas ve solastalji gibi yeni psikolojik kavramlara kavramsal çerçevede yer verilmiştir. Çalışmada, bahçecilik terapisi, orman banyosu, topluluk bahçeciliği ve farkındalık temelli doğa uygulamaları gibi yöntemlerin psikiyatrik belirtiler üzerindeki etkileri değerlendirilmiştir. Bahçecilik terapisinin depresyon, kaygı ve dikkat sorunlarında iyileştirici etkiler sağladığı; orman banyosunun kortizol düzeylerini düşürdüğü, bağışıklık sistemini güçlendirdiği ve uyku kalitesini artırdığı; topluluk bahçeciliğinin sosyal izolasyonu azalttığı ve aidiyet duygusunu güçlendirdiği; farkındalık temelli doğa uygulamalarının ise stres regülasyonu ve öz-farkındalık düzeylerinde artış sağladığı görülmüştür. Bulgular, doğa temelli uygulamaların sadece bireysel psikolojik iyilik hâlini değil, aynı zamanda sürdürülebilir ruh sağlığı politikalarının oluşturulmasını da destekleyebileceğini göstermektedir. Ancak bu müdahalelerin uzun vadeli etkilerine ve farklı kültürel bağlamlara uyarlanabilirliğine dair kanıtlar sınırlıdır. Ayrıca doğa temelli yaklaşımlara yönelik standardize edilmiş ölçüm araçlarının eksikliği, uygulamaların karşılaştırılabilirliğini zorlaştırmaktadır. Klinik uygulamalara entegrasyon için yalnızca yapısal düzenlemelere değil; doğa temelli müdahalelere ilişkin mesleki eğitimlerin geliştirilmesine, ekolojik duyarlılığa sahip protokollerin oluşturulmasına ve disiplinlerarası işbirliğini teşvik eden politika düzenlemelerine de ihtiyaç duyulmaktadır.

Anahtar sözcükler: Ekoloji, iklim değişikliği, ruh sağlığı

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Introduction

With increasing urbanization and the movement of populations toward city centers, there is growing evidence that interaction with and exposure to nature are beneficial for human health. For example, individuals living near green spaces have lower risk of mortality. Proximity to green spaces is also associated with a reduced incidence of diseases such as neurological disorders, cardiovascular diseases, and type II diabetes. According to a recent analysis of systematic reviews examining the relationship between nature and public health, proximity to green spaces reduces the likelihood of conditions including stroke, hypertension, dyslipidemia, asthma, and coronary heart disease (Twohig-Bennett and Jones 2018). Even bringing nature indoors can have positive effects on health and well-being; for example, in a pioneering study, Ulrich (1984) showed that having window views of nature positively affected patients' postoperative recovery.

Although the positive effects of experiences with natural environments on human health and well-being are increasingly well documented, the underlying mechanisms of these effects remain unclear. One prominent explanation, the biophilia hypothesis, argues that humans have an innate attraction to natural environments (Wilson 1984). Evolutionary psychology, on the other hand, suggests that the human brain and body have been shaped by millions of years of living in nature (Myers 1996). This inherent affinity for nature has stimulated interest in and the development of nature-based interventions aimed at improving health and well-being.

Nature-based intervention approaches advocate for the integration of nature-based interventions into psychiatric diagnosis and treatment processes, offering a framework that goes beyond the classical biopsychosocial model (Buzzell and Chalquist 2009, Doherty and Clayton 2011, Capaldi et al. 2014, Bragg and Leck 2017). Such integration entails not only modifying therapeutic techniques but also restructuring the delivery of mental health services with ecological sensitivity (Berry et al. 2010, Gifford and Gifford 2016, Clayton et al. 2017, Pihkala 2020). In practice, such approaches can be implemented through the structured use of contact with nature in both individual and group therapy settings (Wolsko and Hoyt 2012, Bratman et al. 2019, Antonelli et al. 2019).

Nature-based interventions are increasingly being used as complementary treatment modalities in psychiatric clinics, particularly for anxiety disorders, depressive conditions, stress-related disorders, and mood imbalances (Albrecht 2005, Berman et al. 2008, Park et al. 2010, Gonzalez et al. 2011, Corazon et al. 2019). Individuals who undergo these interventions show increased psychological resilience, strengthened self-esteem, and higher levels of environmental awareness (Mayer et al. 2009, Capaldi et al. 2014, Clayton and Karazsia 2020). In clinical settings, nature-based intervention approaches are typically initiated using environmental questionnaires integrated into the individual's psychiatric assessment, nature-based self-efficacy measurements, and psychoecological scales that measure the frequency of contact with nature (Albrecht et al. 2007, Nisbet et al. 2011, Ojala 2012, Clayton et al. 2017, Bragg and Leck 2017, Pihkala 2020). These approaches are applied in therapy programs aimed at increasing contact with nature, particularly for young adults and adolescents, with nature walks, gardening sessions, and mindfulness-based nature practices being particularly prevalent (Guitart et al. 2012, Hickman et al. 2021). Such interventions are used in both individual counseling and in group therapy, providing effects such as reduction in depressive symptoms and increase in positive affect (Park et al. 2010, Clatworthy et al. 2013). Various studies have supported the effectiveness of these programs as a complementary form of psychotherapy for post-traumatic stress disorder (PTSD), adjustment disorders, and somatoform disorders (Lee et al. 2014, Gifford 2014, Bratman et al. 2019, Bielinis et al. 2020).

In clinical decision-making processes, individualized intervention plans can be developed by considering the patient's environmental sensitivity, relationship with nature, and living environment characteristics (Gifford and Gifford 2016, Clayton et al. 2017, Bratman et al. 2019, Pihkala 2020). Especially for individuals with intense environmental concerns, the use of psychoecological assessment forms alongside standard psychiatric scales is now recommended (Albrecht 2005, Lertzman 2015, Cunsolo and Ellis 2018, Usher et al. 2019, Hickman et al. 2021, Ogunbode et al. 2022).

Support mechanisms are needed at both structural and political levels for the integration of nature-based intervention approaches in clinical settings. In this context, important strategies include health policies offering financial incentives for nature-based interventions, therapy areas being located close to green spaces, and the provision of environmental psychiatry training to healthcare professionals (Berry et al. 2010, Gifford 2014, Clayton and Karazsia 2020). Furthermore, structuring public psychiatric services to include modules such as nature-based groups, gardening programs, and forest sessions can facilitate the provision of services integrated with the principle of sustainability in the field of mental health (Guitart et al. 2012, Hartwig and Mason 2016, Richardson et al. 2017).

The integration of nature-based intervention approaches into the clinical field is still limited in Türkiye. However, the urban transformation projects, nature-based public health programs of local governments, and eco-psychology-based studies initiated at universities to date indicate the potential of this field (Kütük and Canel 2024, Subaşı Turğut and Öztürk 2025). Both regulatory changes and widespread educational programs aimed at raising awareness among clinicians are needed to disseminate these practices further. The aim of the present study was to evaluate the therapeutic potential of nature-based intervention approaches in psychiatry from a multifaceted perspective. The effects of horticultural therapy, forest bathing, community gardening, and mindfulness-based nature practices on mental health were examined and new psychological concepts related to climate change such as eco-anxiety, ecological grief, and solastalgia were included in the theoretical framework. This study aims to confirm that interactions between nature and humans constitute resources that can support not only individual psychological well-being but also the development of sustainable mental health policies. In doing so, the study provides scientific and practical contributions regarding the integration of nature-based practices into the clinical field, their cultural adaptability, and their long-term effects.

Conceptual Framework

Nature-based interventions, as a new type of approach in mental health, focus on environmental sustainability by addressing an individual's psychiatric well-being from both biopsychosocial and ecosocial perspectives (Maughan et al. 2014, Clayton et al. 2017). Nature-based approaches define the human relationship with nature as a fundamental component of an individual's mental well-being. Such approaches aim to create clinically sensitive frameworks for understanding the effects of environmental crises on mental health (Albrecht 2005, Buzzell and Chalquist 2009, Berry et al. 2010). The increasing documentation of the therapeutic effects of nature-based interventions supports the use of such approaches in the field of psychiatry.

In the mid-2000s, recognition of the need to examine the relationship between nature and human mental health from a psychiatric perspective led to the development of nature-based intervention approaches (Albrecht 2005, Capaldi et al. 2014). While nature-based practices were previously considered "alternative" therapies, they have gradually become important components of psychiatric treatments (Bratman et al. 2019). However, they possess multifaceted structures, including both direct clinical treatment methods and environmentally sensitive approaches, and their boundaries are not clearly defined (Pihkala 2020). Growing concerns about climate change highlight the need for a more systematic integration of nature-based approaches into diagnosis and intervention processes (Cunsolo and Ellis 2018, Usher et al. 2019, Clayton 2020).

Eco-anxiety offers an important conceptual foundation for the development of nature-based intervention approaches, but it is only one of multiple psychological effects arising from the climate crisis. This condition, typically characterized by persistent anxiety, guilt, helplessness, and hopelessness about environmental disasters, has become particularly prevalent among young people and has drawn attention to the psychological dimension of the climate crisis (Clayton and Karazsia 2020, Pihkala 2020, Hickman et al. 2021). However, eco-anxiety should not be viewed as a fixed psychological syndrome; it should be understood as an emotional response that varies from person to person, is experienced in different ways, and requires different types of intervention. Therefore, instead of adopting a one-size-fits-all approach to

interventions for eco-anxiety, a model that is individualized and encompasses multiple strategies is needed.

The literature to date presents various holistic intervention methods recommended for coping with eco-anxiety, including psychoanalytic approaches, grief-focused therapy, group therapy, existential therapy, cognitive behavioral therapy, acceptance and commitment therapy, art-based approaches, and self-care (Subaşı Turğut and Öztürk 2025). Nature-based interventions such as ecotherapy or horticultural therapy constitute only a portion of these methods, and while they may be beneficial for individuals who have positive connections with nature, they may trigger effects related to environmental losses in other individuals (Hasbach 2015, Pihkala 2020). Even proenvironmental behaviors or activist approaches have been shown to have adverse effects, particularly in individuals experiencing excessive rumination, intense guilt, or loss of control related to the climate crisis. Therefore, it is recommended that clinical practitioners plan their interventions in a flexible and multilayered manner, taking into account their clients' psychosocial foundations, the specifics of their climate anxieties, and their coping capacities (Subaşı Turğut and Öztürk 2025).

Ecological grief, which can be viewed as an extension of eco-anxiety, is the psychological grieving process experienced in the face of environmental destruction and loss of nature. While eco-anxiety involves feelings of fear and helplessness for the future, ecological grief constitutes an emotional response to losses that have already occurred or are irreversible. From this perspective, ecological grief can be understood as a retrospective reflection of eco-anxiety for past events, thus intersecting with theories of trauma, loss, and mourning.

Solastalgia, a third structure that complements the concepts of eco-anxiety and ecological grief, describes an individual's feelings of internal alienation, rootlessness, and melancholy due to environmental changes in daily life (Albrecht 2005, Galway et al. 2019). In contrast to eco-anxiety and ecological grief, solastalgia is a psychological response to physically and spatially experienced change rather than to abstract threats and more general events. Taken together, these three concepts theoretically explain individuals' psychological responses to environmental changes on different levels: eco-anxiety represents anxiety about the future, ecological grief represents loss related to the past, and solastalgia represents current feelings of spatial loss.

These paradigms align with environmentally conscious discourse as well as clinical symptomatology, providing a theoretical foundation for nature-based psychiatric intervention models (Clayton et al. 2017, Usher et al. 2019, Pihkala 2020). In this context, they represent different psychological orientations for understanding the disruption of an individual's relationship with nature, forming the theoretical basis of nature-based intervention approaches. It is argued that individuals can heal through human–nature interaction and that mental health issues should be addressed not only at the individual level but also within ecological and social contexts (Capaldi et al. 2014). In this context, interaction with nature is accepted as both an "environment" and an "intervention environment," and it is structurally incorporated into therapy processes (Buzzell and Chalquist 2009). The structural inclusion of interaction with nature in therapeutic processes means that such interactions are not random or based on individual preference. Structural inclusion entails the planned, systematic integration of a fundamental component of the treatment process. Furthermore, this approach encourages a broader perspective that encompasses the cultural, social, and ethical dimensions of sustainability (Berry et al. 2010).

Nature-Based Intervention Types

Nature-based interventions aim to support psychiatric well-being through an individual's interaction with nature. These interventions are applied individually or in groups and contribute to the reduction of stress, anxiety, and depressive symptoms through contact with nature (Van den Bosch and Ode Sang 2017, Bratman et al. 2019). For example, in a randomized cohort study conducted by Chun et al. (2019), a sample of 59 participants (19 women) with an average age of 60.8 (SD = 9.1) years was divided into two groups. The 30 members of the intervention group participated in a four-day forest therapy program consisting of meditation, forest experiences, and walking activities. The 29 members of the control group participated

in a similar program conducted in a hotel in an urban area, involving meditation and walking. Psychological assessments were conducted before and after the interventions using the Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HAM-D17), and Spielberger State-Trait Anxiety Inventory (STAI). The forest therapy program resulted in significant decreases in BDI, HAM-D17, and STAI scores, while an increase in STAI scores was observed in the urban group. However, no significant difference was found between the groups in terms of oxidative stress indicators such as total antioxidant capacity or ferric reducing antioxidant potential. Overall, the study found that forest therapy was effective in ameliorating psychological symptoms of depression and anxiety but did not produce significant differences in terms of biological stress markers. The main types of nature-based interventions applied within the framework of holistic mental health approaches are described in more detail below.

Horticultural Therapy

Horticultural therapy is a type of intervention that aims to improve psychological well-being through structured or semi-structured activities in which individuals interact directly with plants (Gonzalez et al. 2011, Clatworthy et al. 2013, Kamioka et al. 2014). Studies have shown that this type of therapy leads to significant reductions in symptoms of depression, chronic stress, and anxiety (Van den Berg and Custers 2011, Corazon et al. 2019, Howarth et al. 2020). Furthermore, horticultural therapy contributes holistically to psychiatric interventions by strengthening feelings of self-efficacy and enabling individuals to reconnect with nature (Rappe et al. 2008, Lee et al. 2014, Capaldi et al. 2014, Bragg and Leck 2017). According to Wichrowski et al. (2005), horticultural therapy increased psychological well-being in patients participating in cardiac rehabilitation; it reduced negative emotions such as tension, depression, anger, mental confusion, and fatigue while increasing feelings of vitality. After administration of this therapy, a significant decrease in Total Mood Disorder (TMD) scores was observed and a significant reduction in heart rate was also achieved. Although horticultural therapy is a short-term intervention, it has been found to be effective in supporting both psychological and physiological well-being. Studies examining the effects of horticultural therapy on mental health and its role in nursing indicate that this therapeutic approach has scientifically significant effects in reducing psychiatric symptoms such as depression, anxiety, and stress (Özdemir et al. 2024).

Horticultural therapy is attracting attention with its applicability in various institutions such as psychiatric hospitals, community mental health centers (CMHCs), nursing homes, rehabilitation centers, and prisons. It is emphasized that the therapy gardens where these applications are to be carried out should be designed to be sunlit, easily accessible, quiet, dominated by natural elements (especially green areas), and user-friendly (Rappe et al. 2008). For psychiatric services, safety measures should be prioritized. Horticultural therapy has been found to have multidimensional positive effects on individuals; it can reduce anxiety and depression levels, increase self-esteem and self-efficacy, improve attention and social interaction skills, enhance quality of life, and reduce overall stress levels while reinforcing feelings of peace (Wichrowski et al. 2005). Researchers have stated that this therapy provides significant benefits, particularly for individuals with schizophrenia, dementia, depression, PTSD, and mental or physical disabilities (Özdemir et al. 2024).

Research focusing on the effects of horticultural therapy on individuals with disabilities has involved various applications with children with specific learning difficulties, individuals with intellectual disabilities, and individuals with intellectual, physical, and mental disabilities. These studies have aimed to support individuals' psychological and physical well-being and contribute to rehabilitation processes by ensuring interaction with nature (Uslu and Shakouri 2008, Pouya 2023).

Various studies have emphasized that horticultural therapy has not yet achieved a systematic and institutionalized structure in Türkiye; therefore, interdisciplinary collaboration and the development of educational infrastructure are necessary to promote its widespread application (Özdemir et al. 2024). Although a comprehensive system has not been established at the national level, some specialized trauma centers have adopted horticultural therapy as a therapeutic model based on sustainable growth and integrated it into their clinical practices. In this context, therapy gardens and horticulture-based practices

are considered important tools for psychosocial intervention, particularly for older adults, groups with special needs, and individuals with mental illness, and it is stated that they should be supported by governmental policies and the healthcare system (Özdemir et al. 2024).

In ethnobotanical studies on horticultural therapy, it is emphasized that the plant species used in therapeutic gardens should not only be aesthetically pleasing but should also possess properties that support individuals' physical and cognitive well-being. In this context, Satıl and Aktaş (2021) conducted a study of 54 CMHCs across Türkiye and found that a total of 42 different plant taxa were used for therapeutic purposes. These plants were chosen for multifaceted purposes including visual aesthetics, scent, and food-based production; however, there was no standardization among CMHCs regarding which plant species should be used, resulting in significant local diversity in plant selection.

This scattered approach to applications in Türkiye is noteworthy compared to similar undertakings in countries such as China and Brazil. In the latter countries, there is a knowledge-based consensus and standard of practice regarding the plant species to be used in horticultural therapy. These comparisons reveal that horticultural therapy in Türkiye has not yet been sufficiently structured in terms of either application or content and lacks institutional guidance. The lack of standardization limits the effectiveness of applications and delays the professionalization of this field (Satıl and Aktaş 2021).

Although many studies emphasize the positive effects of horticultural therapy on mental well-being, some research has suggested that interventions of this type do not produce statistically significant results. For example, a systematic review conducted by Kamioka et al. (2014) noted that most studies on horticultural therapy had low methodological quality, insufficient sample sizes, and, in many cases, no control group. Therefore, the generalizability of the effects was said to be low.

Forest Bathing (Shinrin-yoku or Forest Therapy)

People have enjoyed forest environments for centuries due to their quiet atmosphere, beautiful scenery, mild climate, pleasant scents, and clean air (Li 2019). Forest bathing is a Japanese practice based on consciously spending time in a forest environment; it is considered a form of psychiatric intervention due to its relaxing effects on both physiological and psychological levels (Park et al. 2010, Li et al. 2011, Ochiai et al. 2015). The Japanese name for forest bathing, shinrin-yoku, literally means "deliberate immersion in the forest atmosphere." The concept was developed in Japan in 1982 and has since become an international health trend (Ergüven 2024). In Japan, a series of studies investigating the effects of forest environments on human health have been conducted since 2004, and a new branch of medicine called forest medicine was developed as a result. Forest medicine is an interdisciplinary science that encompasses alternative medicine, environmental health, and preventive medicine, examining the effects of forest environments on human health (Li 2019). Forest environments have been shown to have various benefits for human health. For example, it has been scientifically proven that forest bathing lowers cortisol levels, reduces sympathetic nervous system activity, and significantly supports a positive mood (Lee et al. 2014, Antonelli et al. 2019). Additionally, forest bathing practices have been reported to have complementary effects for clinical conditions such as anxiety disorders and burnout syndrome (Mayer et al. 2009, Bielinis et al. 2020, Ergüven 2024), and Ochiai et al. (2015) demonstrated that forest bathing had positive effects both psychologically and physiologically in individuals with high-normal blood pressure. After the intervention conducted by Ochiai et al. (2015), participants felt more relaxed and natural, and a significant decrease was observed in negative emotions such as tension-anxiety, mental confusion, and anger-hostility, as well as in TMD scores. Among the evaluated physiological measurements, blood pressure, urinary adrenaline levels, and serum cortisol levels decreased significantly after forest therapy. Overall, their study showed that even short-term forest bathing can improve mental well-being and reduce stress-related biomarkers. This is because volatile substances in forest air, such as terpenes, exert healing effects by positively affecting immune cells, and particularly NK cells. Terpenes are natural volatile oil compounds produced by trees. They are found in forest environments within tree leaves, tree bark, fungi, moss, and shrubs. They are secreted to protect plants from various insects and microorganisms and they also have aromatic and therapeutic effects for humans, such as those associated with pine scents. When terpenes are inhaled, they have a calming effect on the nervous system. They also stimulate NK cells, which

are part of the immune system's special defense mechanisms. Researchers have demonstrated that after forest bathing, the number and the effectiveness of NK cells remain high for 30 days. This provides a significant advantage in protecting against infections and reducing stress (Ergüven 2024). Li et al. (2011) conducted a similar study and reported that even a single day of forest bathing offers immune-boosting effects. A single day of forest bathing resulted in a significant increase in NK cells in their study, and this effect lasted for at least 7 days. Such effects are thought to be due to the release of phytoncides by trees and the decreasing of stress hormones.

In recent years, studies on forest bathing (shinrin-yoku) and forest therapy have significantly increased in Türkiye. These studies have aimed to reveal the positive effects of forest bathing on health, and some have also sought to identify suitable natural areas in Türkiye for these activities. The limited relevant studies in the literature have highlighted three areas as being particularly appropriate: Günlüklü Koyu Sığla Forest in Fethiye, Muğla (Ardahanlıoğlu 2023); the Kofçaz district of Kırklareli and its surroundings (Ergüven 2024); and the Sakarı region, consisting of the Mihalgazi, Sarıcakaya, and Sakarıılıca areas of Eskişehir (Kaya and Ergüven 2022).

Located within the Ömer Eşen Nature Park in the Fethiye district of Muğla province, Günlüklü Bay is covered with endemic sweetgum trees (Liquidambar orientalis), which are rare in Türkiye and have survived from the Ice Age to the present day. This area offers unique natural features for forest bathing practices. The study conducted by Ardahanlıoğlu (2023) emphasized that the Günlüklü Koyu Sığla Forest provides an environment in which the five senses are actively stimulated and individuals can consciously interact with nature.

The natural forest areas around Kofçaz, a small district of Kırklareli province in the Thrace region of Türkiye, was also identified as being suitable for forest bathing practices. Ergüven (2024) suggested that, as is done in Germany, certain areas in Türkiye could be officially designated and certified as "healing forests" or "therapeutic forests." In this context, forest bathing training programs have been planned in collaboration with Kırklareli University and the Thrace Development Agency, and these initiatives have also been supported by the United Nations World Tourism Organization. Furthermore, the Marmara Forestry Research Institute initiated studies in 2024 to institutionalize forest bathing practices in Türkiye. Within the framework of collaboration with the German Forest Bathing Academy, it is aimed to launch more systematic initiatives in this field in Türkiye as of 2025 (Ergüven 2024).

Another promising area for forest bathing applications in Türkiye is the Sakarı region, encompassing Mihalgazi, Sarıcakaya, and Sakarıılıca in Eskişehir province, which stands out for its rich vegetation, diverse tree species, high air quality, and microclimate characteristics. With its quiet and peaceful natural environment, this region is extremely suitable for forest bathing practices and has properties that can support individuals' mental and physical well-being by allowing them to interact with nature.

The international literature contains important findings on the effects of forest bathing on human health. In a study conducted in 1980, Swedish researcher Roger Ulrich scientifically demonstrated that even a tree being visible from a hospital window accelerated patients' recovery processes. This study, published in Science, showed that the natural environment contributes to psychophysiological recovery through visual perception, with wide impact throughout the scientific community (Kaya and Ergüven 2022). Forest bathing offers multifaceted and scientifically proven positive effects for the immune system, mental health, the cardiovascular system, and sleep quality. These effects may be supportive in preventing chronic diseases such as cancer, depression, hypertension, sleep disorders, and metabolic diseases (Li 2022, Li et al. 2022). When considered on more general levels, forest environments and forest bathing have positive effects on people and possess healing power (Li 2019). Kotera et al. (2022), in their systematic review of forest bathing, noted that women in particular reported higher levels of benefits. Morita et al. (2011) investigated the relationship between insomnia complaints and forest bathing and found positive effects on sleep duration and quality. Women's insomnia complaints decreased by 50% with monthly forest bathing sessions (Morita et al. 2024). A similar study based on a literature review was presented by Balmumcu and Pekince (2023), who concluded that forest bathing has positive effects on blood pressure,

stress, the immune system, and psychological well-being in women. It was emphasized that forest therapy could contribute positively to women's health in Türkiye.

In conclusion, forest bathing (shinrin-yoku) is a nature-based psychosocial intervention method that is attracting increased attention in the psychiatric field. Although some studies on forest bathing have demonstrated short-term stress-reducing effects, there are no clear findings regarding the sustainability of these effects. For example, a study by Lee et al. (2014) reported that although short-term positive changes were observed in individuals participating in forest therapy, the effects were not sustainable in the long term and changes in biological markers did not reach statistically significant levels. Furthermore, a meta-analysis by Antonelli et al. (2019) indicated that although a decrease in cortisol levels was observed, the results were inconsistent due to heterogeneity among the analyzed studies.

Community Gardening

Community gardening is a type of intervention in which individuals come together to participate in nature-based production activities, thereby increasing social connectedness and participation (Kingsley et al. 2009, Okvat and Zautra 2011, Guitart et al. 2012, Hartwig and Mason 2016). This approach has a therapeutic effect, particularly in efforts to treat social isolation and loneliness or facilitate post-traumatic resocialization (Milligan et al. 2004, Poulsen et al. 2014, Corrigan et al. 2020). Furthermore, community gardens provide alternative healing spaces for individuals with limited access to nature in urban life and establish strong links between environmental justice and mental health (Draper and Freedman 2010, Firth et al. 2011, Hale et al. 2011). Community gardening increases subjective well-being in individuals through a sense of belonging, social connectedness, responsibility, and awareness of the present moment (Suto et al. 2021). It also reduces stress, anxiety, and depression (Guo et al. 2024) while strengthening social bonds and supporting nutrition and lifestyle.

Community gardening is a practice that enables individuals living in cities to come together and farm in shared spaces, contributing to social solidarity, environmental sustainability, and food security among other benefits. Applications in this field are increasing in Türkiye, as seen in the cases of various examples. In Istanbul, Roma Bostanı, Yedikule Bostanları, Fenerbahçe Park Community Garden, Kadıköy Ecological Life Center, and Kuzguncuk Bostanı are some community gardens maintained with the participation of local community members. Studies clearly indicate the positive effects of community gardening on anxiety, depression, stress, cognition, and social connectedness. There are positive effects such as increased physical activity, better nutrition, belonging, the strengthening of bonds, and a sense of achievement (Poulsen et al. 2014, Corrigan et al. 2020, Suto et al. 2021, Guo et al. 2024).

While the psychosocial benefits of community gardening practices are often emphasized, some studies have noted that this effect is limited to specific social groups and does not lead to clinical improvement at the psychiatric level. Corrigan et al. (2020) emphasized that the effects of community gardens on participants were primarily shaped by social connectedness and dietary habits, but no clinically significant reduction in depression and anxiety symptoms was observed.

Mindfulness-Based Nature Practices

Mindfulness-based nature practices are psychoeducational approaches that support an individual's inner balance and stress management by implementing attention-focused mindfulness techniques in natural environments (Nisbet et al. 2011, Wolsko and Hoyt 2012). These approaches aim to implement traditional mindfulness techniques in interactions with nature with the goal of enhancing both mental and physical well-being. These practices have attracted attention in recent years, particularly in the fields of psychiatry, psychology, trauma therapy, stress management, and community mental health.

Thanks to nature's regulatory effects on cognitive attention systems, these practices reduce anxiety levels and increase self-awareness (Berman et al. 2008). Mindfulness-based nature practices can support traditional therapies, especially in cases of PTSD, panic disorder, and depression (Kabat-Zinn 2003, Capaldi et al. 2014). While it is claimed that such practices have positive effects, particularly on anxiety and stress,

some studies report that the effects vary depending on individual differences and that mindfulness practices in natural environments even cause restlessness and distraction in some individuals. For example, Nisbet and Zelenski (2011) noted that nature-based mindfulness practices can increase feelings of loneliness in some individuals, indicating that these practices are not universally effective.

Table 1. Nature-based intervention approaches

Intervention Type	Definition/Key Features	Fields of Application	Scientific Impact	Examples of Studies
Horticultural Therapy	Aims to improve mental well-being through structured or semi-structured activities based on direct interaction with plants	Psychiatric hospitals, CMHCs, rehabilitation centers, nursing homes, prisons	Decreased depression, anxiety, and stress; increased self-efficacy and attention	Wichrowski et al. (2005), Van den Berg and Custers (2011), Özdemir et al. (2024)
Forest Bathing (Shinrin-yoku)	Based on spending time in a forest environment with mindful awareness; strengthens the immune system, lowers cortisol, and improves mood	Forests in general, "health forests," therapy trails, natural parks	Increase in NK cells, decrease in cortisol, improvement in mood, increase in sleep quality	Park et al. (2010), Li et al. (2011, 2022), Antonelli et al. (2019), Morita et al. (2011, 2024)
Community Gardening	Nature-based production in shared urban spaces increases social interaction and a sense of belonging, supporting post-traumatic socialization	Community gardens, municipally supported areas, ecological living centers	Decrease in loneliness and depression; increase in social connectedness and subjective well-being	Kingsley et al. (2009), Poulsen et al. (2014), Corrigan et al. (2020), Suto et al. (2021)
Mindfulness-Based Nature Practices	Attention-focused mindfulness exercises performed in nature, reducing stress and anxiety and improving inner balance	Natural parks, forest areas, camping areas, outdoor therapy areas	Decrease in anxiety and panic disorders; increase in self-awareness and stress management	Kabat-Zinn (2003), Nisbet and Zelenski (2011)
Ecotherapy	A nature-focused psychotherapeutic approach that helps individuals reconnect with nature and supports meaning-making and mental integrity	Therapeutic gardens, outdoor areas for psychotherapy, areas for individual/group therapy in nature	Decrease in traumatic symptoms; increase in environmental awareness and psychological integrity	Buzzell and Chalquist (2009), Wolsko and Hoyt (2012)

Ecotherapy

Ecotherapy is a comprehensive field of practice that recognizes an individual's relationship with nature as a restorative force and actively integrates this relationship into the psychotherapeutic process (Buzzell and Chalquist 2009, Doherty and Clayton 2011). This approach can facilitate improvement in stress, depression, and dissociative symptoms through the conscious use of natural environments in individual or group-based psychotherapies (Wolsko and Hoyt 2012). Furthermore, ecotherapy aims to support the individual's reconnection with nature, meaning-making, and spiritual wholeness rather than focusing solely on symptoms (Buzzell and Chalquist 2009, Gifford 2014, Capaldi et al. 2015, Bragg and Leck 2017).

Studies have evaluated the physical, psychological, and social effects of therapeutic gardens established on the grounds of mental health or general hospitals for patients, their relatives, and healthcare workers.

"Healing gardens" are planned gardens integrated into healthcare institutions such as hospitals, CMHCs, nursing homes, and rehabilitation centers, featuring natural plants, walking paths, water features, shade structures, and seating areas. Their purpose is to reduce stress, accelerate healing, alleviate anxiety, and evoke positive feelings in patients and visitors. A study in the United States examining the stress-reducing effects of hospital gardens on cancer and orthopedic patients showed that even a 5-minute garden experience reduced anxiety. Similarly, interactions with nature and participation in garden care during the recovery process of psychiatric patients alleviated traumatic stress symptoms (Cooper-Marcus and Barnes 1999).

Contact with nature is considered a complementary therapy method in the field of psychiatry, particularly for mental disorders such as anxiety, depression, and PTSD. In this context, "healing garden" applications can provide significant benefits for individuals diagnosed with schizophrenia, bipolar disorder, and major depression. Such nature-based interventions contribute to the restructuring of individuals' perceptions of reality, the establishment of routines in daily life, and the regulation of emotions (Cooper-Marcus and Barnes, 1999).

The establishment of therapy gardens in CMHCs, psychiatric hospitals, and child and adolescent psychiatric services is recommended as an important component of supportive approaches in this field. Therapy gardens should be structured to support individuals' sensory and cognitive stimulation. Sensory gardens should be designed to include quiet relaxation areas, interactive nature elements (including plants that stimulate the sense of smell, such as lavender and rosemary), and sensory stimuli that appeal to touch, smell, and listening (Özdemir et al. 2024).

Gardening therapies, forest bathing practices (shinrin-yoku), community gardening activities, mindfulness-based nature-based practices, and group ecotherapy can offer holistic intervention frameworks that support individuals' psychosocial functioning. In this regard, nature-based therapy models are considered effective practices that contribute to the development of sustainable, accessible, and human-centered approaches in mental health services.

Discussion

The literature on nature-based intervention approaches contains numerous studies documenting the positive effects of nature-based interventions; however, evidence regarding the long-term psychiatric effects of these interventions is limited (Capaldi et al. 2014, Clayton et al. 2017). The lack of clinically differentiated datasets addressing the psychiatric diagnoses for which these interventions are most effective makes it difficult to standardize practices (Park et al. 2010, Gonzalez et al. 2011, Corazon et al. 2019). Furthermore, many studies conducted to date are limited to small sample groups, and causal relationships cannot be adequately tested due to the scarcity of randomized controlled trials (Berman et al. 2008, Lee et al. 2014, Antonelli et al. 2019). This makes it difficult to evaluate nature-based intervention approaches within the scope of evidence-based psychiatry (Albrecht 2005, Berry et al. 2010, Usher et al. 2019, Clayton 2020, Pihkala 2020, Hickman et al. 2021).

Nature-based intervention approaches constitute a framework that has not yet been incorporated into diagnostic systems such as the DSM-5 or ICD-11; therefore, there is still theoretical uncertainty in diagnosis-based applications (Albrecht et al. 2007, Lertzman 2015, Cunsolo and Ellis 2018, Clayton and Karazsia 2020, Pihkala 2020, Ogunbode et al. 2022). The fact that concepts such as eco-anxiety, ecological grief, and solastalgia have not yet been systematically integrated into psychiatric assessment tools creates conceptual gaps in measurement and evaluation processes (Clayton et al. 2017, Clayton 2020, Hickman et al. 2021). Furthermore, the diversity of application methods including gardening, mindfulness-based nature practices, and forest bathing reduces the integrity of the criteria used in this field and makes comparisons difficult (Buzzell and Chalquist 2009, Richardson et al. 2016). The interactions of these practices with other variables such as access to nature, socioeconomic status, and age are often overlooked (Mayer et al. 2009, Wolsko and Hoyt 2012, Capaldi et al. 2014, Gifford and Gifford 2016, Antonelli et al. 2019).

Nature-based intervention approaches have largely been developed in Western-centric societies and thus have significant limitations in terms of sensitivity to cultural contexts (Buzzell and Chalquist 2009, Castleden et al. 2011, Richardson et al. 2020, Pihkala 2020). Similarly, forest bathing practices have been shaped by a Japanese cultural perception of nature and it remains unclear whether they can produce similar effects in different climatic and social settings (Park et al. 2010, Li et al. 2011, Ochiai et al. 2015, Antonelli et al. 2019, Bielinis et al. 2020). Practices such as community gardens may also not yield similar psychiatric outcomes in different geographical areas due to the cultural variability of the meaning individuals attach to nature (Firth et al. 2011, Hale et al. 2011, Poulsen et al. 2017). Religious, traditional, and ethical values associated with nature can be decisive in the acceptance and effectiveness of such interventions (Berry et al. 2010, Guitart et al. 2012).

Nature-based intervention approaches offer a holistic model that requires collaboration not only among psychiatrists but also among psychologists, environmental scientists, public health specialists, social service professionals, and educators (Buzzell and Chalquist 2009, Gifford 2014). For interventions in this field to be effective and sustainable, it is crucial that nature-based therapies be integrated with scientifically validated practices and that different professional groups operate within a cohesive ethical framework (Wolsko and Hoyt 2012, Pihkala 2020). Furthermore, incorporating parameters such as environmental factor assessment, spatial planning, and green space access into psychiatric processes is possible with multidisciplinary collaboration (Mayer et al. 2009, Gifford and Gifford 2016). Including ecological awareness modules in the psychiatry and psychology curricula of educational institutions will provide a basis for long-term integration (Albrecht et al. 2007, Berry et al. 2010, Usher et al. 2019, Clayton and Karazsia 2020, Hickman et al. 2021).

Conclusion

This study has comprehensively examined the concept of nature-based intervention approaches, intended to address the effects of climate change on mental health within the discipline of psychiatry. Nature-based intervention approaches are holistic approaches that conceptualize an individual's psychiatric well-being within an ecological framework by integrating nature-based interventions into clinical practice. Although various studies have demonstrated the positive effects of practices such as horticultural therapy, forest bathing, community gardens, and mindfulness-based nature practices on various mental symptoms, more in-depth studies are needed to determine whether these effects are long-term or generalizable across cultures. Nature-based intervention approaches are not only a therapeutic field at the individual level; they offer promise as strategic approaches that can contribute to the development of sustainable mental health policies.

It is important for clinical psychiatry practitioners to adopt a perspective that takes environmental factors into account in the process of recognizing and assessing mental health effects related to climate change. When assessing disorders such as anxiety, depression, and PTSD, the individual's relationship with environmental stressors should be taken into account and awareness of concepts such as eco-anxiety and solastalgia should be increased. Including questions about the level of access to nature, experiences of environmental grief, and the individual's psychological connection to nature in psychiatric assessments will facilitate more comprehensive mental health evaluations. It is recommended that clinical practitioners develop nature-based therapy modules tailored to patients' needs, such as nature walks, group mindfulness-based nature activities, or outdoor therapy sessions, and view these practices as a part of mental health service provision. Furthermore, collaboration with colleagues from other disciplines, such as environmental scientists and social workers, is necessary to establish nature-based intervention programs at the institutional level.

Future research should be based on comparative, multicenter, and long-term datasets that examine the effects of nature-based interventions across populations with different psychiatric diagnoses. Evaluating phenomena such as eco-anxiety, ecological grief, and solastalgia with highly valid and reliable measurement tools will contribute to the integration of these concepts into psychiatric classification systems. In Türkiye, case studies investigating the effects of nature-based interventions on women, young

people, and individuals living in rural areas will be particularly important for the development of the field. Finally, multidisciplinary research in the field of nature-based intervention approaches conducted with a perspective that incorporates ethical dimensions, environmental justice, and equal access will ensure the sustainability of the discipline.

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