

## FOREST THERAPY AND FOREST BATHING IN 5 EUROPEAN COUNTRIES – BASIC DESCRIPTION

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<https://doi.org/10.11118/978-80-7701-087-0-0156>

### Abstract

Project Integrating Nature into Higher Education: Forest Bathing has the main goal to create digital training modules on forest bathing to make forest bathing more known and accessible. It is important to first increase the skills and knowledge of the education personnel for this purpose. When academics reach a sufficient level of knowledge about forest bathing, they will contribute to the society benefiting from the importance of nature on the mental health and well-being of individuals. Our aim is to make the idea of forest bathing more accessible to academics and students in other fields, including forestry and social sciences, with digital training modules. In this article we are describing the basic of the state of art of the forest therapy and forest bathing in 5 european countries.

**Key words:** Articles, literature review, methodology, Europe

### Introduction

Originating in Japan as Shinrin-yoku, forest bathing is a practice that is becoming increasingly popular and allows people to experience the forest through their five senses (Li, 2010). Literature shows that forest bathing has many positive physical and psychological effects on human health (Wen et al., 2019). However, in Turkey, studies on the concept of forest bathing are still in their infancy. Considering the potential and abundance of forests in Turkey, it is possible to say that there is a suitable environment for marketing forest bathing as a tourism product. Research on the subject generally seems to focus on environmental sustainability and individual well-being (Çalhan, 2025).

### Materials and methods

This study is a descriptive bibliometric study based on data from the Web of Science (WoS) collection. It is a popular database for bibliometric analysis due to its wide range of topics, high-quality content, citation-tracking capabilities, and advanced features that enable efficient and reliable searching, filtering, and the generation of impact indicators.

The data strategy used included the search vector: “therapy” (topic) or “landscape” (topic) or “forest” (topic) or “human health” (topic). The search for articles was conducted using the keywords “forest bathing,” or “forest therapy” or “green therapy” or “peri-urban forest” or “positive and negative affect schedule” or “profile of mood states” or “restorative outcome scale” or “shinrin-yoku” or “therapeutic landscape” “urban forest” or “subjective vitality scale.” The global literature review on the above-mentioned issues was limited to articles and review articles (document types: article or review article), with a time limit of the last 10 years (publication years: 2015-2025) and presenting results of research conducted in Poland, Turkey, Czechia, Italy and Lithuania (countries/regions: Poland, Turkey, Czechia, Italy, Lithuania).

### Results

#### **Poland**

In Poland, since the onset of the COVID-19 pandemic, the number of publications on the impact of forests on human health has increased significantly. Approximately 75% of the publications in the collection were produced after 2020. Most of the works on this topic were produced in forestry and environmental sciences. This dominance underscores the importance of both disciplines in advancing knowledge of cultural services, particularly relaxation and therapeutic services provided by forest

ecosystems. The next positions are occupied by studies in the field of technological sciences, as well as psychiatry and psychology. The leading universities conducting research on forest bathing and forest therapy are the University of Warmia and Mazury and the Warsaw University of Life Sciences. Both institutions serve as key centers for academic collaboration in research on the therapeutic benefits of forest landscapes. The vast majority of published works present results based on the impact of the forest landscape or selected features on the relaxation of only one research group: young Polish adults. In the remaining cases, the study sample consisted of working adults and psychiatric hospital patients. All analyzed studies used psychological tests to identify the relaxation benefits of forest contact; in several studies, selected physiological parameters, such as heart rate and blood pressure, were also monitored. In general, the restorative effects of the forest were assessed using psychological tests such as the Positive and Negative Affect Schedule (PANAS), the Restorative Outcome Scale (ROS), the Subjective Vitality Scale (SVS), and the Profile of Mood States (POMS). In addition to the POMS and ROS tests, SVS, a specialized questionnaire—the Pure Procrastination Scale (PPS)—was used, as were the Fluid Procrastination Scale (FPS) and the State-Trait Anxiety Inventory (STAI-S). All of the analyzed studies measure the impact of landscape on human psychological and physiological characteristics using a Pre-Post Test design, which involves conducting a measurement (test) on the same group of individuals before (pre) the intervention (e.g., exposure to a forest landscape), and then repeating the measurement after (post) the conclusion of that intervention to assess its effectiveness by measuring changes in mood, well-being, blood pressure, and heart rate. The vast majority of studies focused on the physiognomic variability of the forest landscape. Among the analyzed features of the forest landscape were, for example, forest type (deciduous forest, coniferous pine forest, mixed forest); the presence of open non-forest enclaves such as wetlands or treeless dunes; forest plantations; and clear-cut areas. Several studies analyzed the temporal variability of the forest landscape, including comparisons of the forest landscape with vegetation in a dormant state and in spring, and examined the impact of a snow-covered forest landscape on visitors' relaxation. The subject of analysis in the published, reviewed studies was elements that diminish landscape value, such as illegal trash dumps in the forest. In summary, all of the analyzed studies demonstrate that the forest landscape possesses regenerative properties. Despite the already considerable number of studies in this area, the relationship between the forest landscape and the observer remains poorly understood. Further research is necessary to determine how the auditory and olfactory qualities of the forest landscape influence human relaxation, as well as studies testing the impact of exposure time on the level of relaxation benefits.

### **Italy**

A growing number of initiatives and activities referred to as “Forest Bathing” or “Forest Therapy” (FB/FT) is currently being implemented in Italy, as a result of the increasing interest in alternative and integrated solutions for treatment and healthcare promotion. Due to the benefits, often supported even by clinical studies, confirming the therapeutic effectiveness of these activities, FB/FT initiatives offer a business opportunity both for the forestry sector – through an increase of public recreation and sustainable development of rural areas - and for the socio-economic system - thanks to the positive impact on the National Health Service. However, despite its significance, determining whether an FB/FT site is suitable in Italy, still lacks a precise legal foundation and conventional operating processes. Because of this, FB/FT programs have been implemented in a not yet adequately regulated variety of settings, including urban and extra-urban forest areas, using a "self-referential" strategy, to carry out activities deemed appropriate. The first step in promoting a significant tool that can address many social needs, should therefore start from a consistent scientific and technical approach for the identification of FB/FT-suitable places and associated activities.

In the present paper, the literature review carried out within the INHEF Project, to assess the state of FB/FT in Italy, has resulted in the identification of 43 most relevant scientific articles describing the situation in this Country. From this analysis, it may be concluded that FB/FT had gained a significant scientific and institutional recognition. Indeed, some of the most important Italian research institutes (CNR, CAI, CREA) are currently working together, to develop medical protocols that demonstrate positive health effects - such as reduced cortisol levels and lower blood pressure. Green prescriptions are being introduced within the National Health Service to treat medical conditions - such as anxiety and depression. Strict standards have been established for the certification of forests used for FB/FT, taking into account factors such as air quality and biodiversity. The sector is regulated through training programmes for Forest Bathing guides and Forest Therapy practitioners, with national registers managed by certification bodies. Furthermore, there is a growing popularity of urban Forest Therapy, as well as an increase in wellness tourism, with regions (e.g., Tuscany; Trentino; etc.) which are capitalizing on its great economic potential.

## **Czechia**

Presented studies confirm that forests are essential tools for supporting mental and physical health in an increasingly urbanized world. Short-term exposure (as brief as 15–20 minutes) has been shown to lower stress biomarkers like saliva cortisol, alleviate symptoms of anxiety and depression, and significantly increase feelings of vitality.

A key finding is the distinction between actual and perceived biodiversity. While measured tree species richness often has a limited impact on immediate regeneration, the perceived richness of the environment—a subjective assessment of diversity and "wildness"—is a powerful predictor of psychological well-being. From a management perspective, mature forest stands are the most suitable for mental restoration. Conversely, clear-cut areas evoke negative emotions, increase tension and depression, and demonstrably disrupt the restorative process.

Modern technology offers alternatives for individuals who cannot easily access nature. Virtual Reality (VR) and forest "digital twins" provide levels of relaxation comparable to real environments, although their efficacy can be limited by cybersickness. In clinical practice, such as oncology waiting rooms, audio-visual forest stimulation significantly improves patients' emotional valence and reduces arousal.

Forests also serve as tools for social restoration. For adolescents exhibiting risky behavior, forest therapy combined with observational learning from animal social structures (e.g., wolves or bees) helps reduce aggression and improves cooperative skills. Economically, studies prove it is possible to harmonize recreational functions with timber production if these services are an owner's priority and utilize diverse funding sources

## **Lithuania**

A bibliometric analysis was conducted using the Web of Science (WoS) database, focusing on research and review articles published between 2015 and 2025. The selected publications, prepared in collaboration with international co-authors, were further analyzed based on their relevance to the research objectives. In total, 15 publications were included in the analysis.

The analysis revealed that two studies directly addressed forest therapy and forest bathing, emphasizing the recreational and emotional relationship between humans and natural environments. Five additional studies examined aspects related to the topic, including ecological processes in urban green spaces, air quality improvement, plant species identification, and ecosystem services. These studies provide an important contextual foundation for understanding environmental quality, the structure and functioning of green infrastructure, and its relevance to nature-based health practices.

International research highlights the significant role of urban green spaces in promoting human wellbeing. Studies on public participation in urban forest planning demonstrate that community involvement enhances human–nature interaction and supports the use of green spaces for recreation and environmental awareness. Similarly, research on tourist perceptions shows that urban green infrastructure is widely used for relaxation, physical activity, and social interaction, even when users are not familiar with the concept itself

Ecological studies conducted in Lithuania further emphasize the importance of urban ecosystems. Research on leaf litter decomposition and soil properties indicates that tree species, seasonality, and green space type influence ecosystem functioning. In addition, studies on air pollution mitigation highlight the role of urban trees in improving air quality and contributing to better living conditions.

In Lithuania, research on forest therapy has developed across three main domains: biomedical, psychological, and landscape architecture. Biomedical studies focus on the effects of phytoncides on the immune system and blood pressure, while psychological research emphasizes stress reduction and improvements in emotional wellbeing. Studies in landscape architecture highlight the importance of planning and designing therapeutic environments.

An analysis of Lithuanian scientific literature, based on national academic databases (Lituanistika and eLABa), underscores the growing relevance of nature-based health approaches. Research demonstrates that forest therapy can support immune system functioning and reduce stress levels, thereby contributing to the development of "green prescription" strategies as preventive healthcare measures. Other studies emphasize the therapeutic potential of forest environments, particularly pine forests, and their application in rehabilitation and health promotion.

Furthermore, landscape-based research indicates that well-designed natural environments can enhance emotional and spiritual wellbeing. Studies on forest bathing confirm that structured activities in natural settings contribute to stress reduction and improved psychological wellbeing

Overall, although forest therapy remains a relatively new and interdisciplinary field in Lithuania, both international and national studies consistently highlight the significant role of natural environments in enhancing human health, wellbeing, and quality of life.

## Turkey

Studies on forest bathing in Türkiye have identified specific destinations and routes. Accordingly, Fethiye Günlüklü Bay, Karabük Yenice Forests, and Artvin Kafkasör City Forest have been evaluated for forest bathing purposes (Ardahanlioğlu, 2023; Karaşah, 2022). Karaşah (2022) emphasizes in their study that many recreational activities can be considered within the scope of forest bathing. In addition, they stated that there was a positive effect on their mood after spending time in the forest. This indicates that forest bathing can be developed as a nature-based tourism product in Türkiye. The study conducted on Kafkasör City Forest emphasizes that this practice can create a strong brand value in destination marketing in the Black Sea Region. In another study conducted in Turkey, Ekinci (2025) examined the effects of forest bathing experience on camping individuals and found that time spent in a forest environment led individuals to inner transformation and awareness. This study demonstrates that forest bathing deepens the recreational experience. Furthermore, the İzmir Balçova and Narlıdere Therapy Forests, implemented in Turkey under the leadership of the Ministry of Agriculture and Forestry, provide concrete examples of how this concept has been integrated into public policies and tourism management strategies (Karaşah, 2022).

In the literature studies conducted in the field of health in Türkiye, it has been stated that forest bathing and forest therapy have positive effects on the cardiovascular system, nervous system, immune system, and mental health, but it has been emphasized that empirical studies on this subject in the field of health in Türkiye are quite limited. It is stated that research in this field will make important contributions, given Türkiye's rich forest resources (Kutlu, 2025).

In accordance with the principles of environmental and cultural sustainability, forest bathing is considered as an environmentally friendly, low-impact model against the destruction that mass tourism can create. Accordingly, forest bathing can play an effective role in protecting our forests, which are our natural heritage, for future generations (Akyol & Tolunay, 2006).

Another dimension that has recently attracted attention in studies conducted in Turkey is the therapeutic effects of forest bathing on stress management and burnout syndrome. Studies in the fields of organizational behavior and human resources suggest integrating forest therapy into corporate health and wellness programs to increase the psychological resilience of corporate employees. Findings show that these practices reduce negative moods and positively contribute to work-life balance are being adapted to the context of working life and health tourism in Turkey (Pekince & Balmumcu, 2023).

Forest bathing in Türkiye is not yet as institutionalized a practice as in Japan or Europe. However, urban forests, national parks, nature parks, and ecotourism areas are considered suitable areas for forest bathing practices. It is stated that forest areas, especially in the Black Sea, Mediterranean, and Marmara Regions, have significant potential for forest bathing and nature-based wellness tourism (Ergüven, 2019). In Türkiye, forest bathing practices are generally carried out through walks in urban forests, nature meditation, forest yoga, camping and nature therapy, ecotourism activities, and nature-based wellness programs. In conclusion, in the Turkish literature, forest bathing practices are considered a simple form of recreation.

## Conclusion

### Current State and Perspectives of Forest Therapy in an International Comparison

The presented studies from Poland, Italy, Czechia, Lithuania, and Türkiye confirm that forest ecosystems play an indispensable role in supporting public health. Although individual countries are at different stages of implementation, common trends and specific benefits can be clearly identified.

#### 1. Evidence-Based Health Benefits

All analyzed countries agree on the **positive impact of forests on mental and physical health**. Research consistently demonstrates:

- **Physiological effects:** Reduction in blood pressure, heart rate, and cortisol levels, and strengthening of the immune system (notably through phytoncides, as highlighted by Lithuania).
- **Psychological effects:** Reduction of stress, anxiety, depression, and burnout syndrome; improvement in vitality and subjective well-being.
- **Specific findings:** Czechia emphasizes the role of "perceived biodiversity," while Turkish studies point to the potential for inner transformation and mindfulness among participants.

#### 2. Institutionalization and Legislative Framework

Significant differences exist in the level of formal integration across the regions:

- **Italy** is the most advanced in integrating these practices into public policy, introducing "**green prescriptions**" and establishing strict certification protocols for therapeutic forest sites.

- **Lithuania and Poland** are experiencing intensive academic growth. Lithuania is already working on green prescription strategies as preventive healthcare measures.
- **Türkiye** currently views forest bathing primarily as a form of recreation and a niche tourism product, although it has begun implementing therapeutic forests under the Ministry of Agriculture and Forestry.

### 3. Methodology and Target Groups

Research relies on a multidisciplinary approach combining biomedicine, psychology, forestry, and landscape architecture.

- **Poland** has seen a surge in publications since 2020, though research remains primarily focused on young adults.
- **Czechia** expands the field with innovative uses of technology (**Virtual Reality**) and social restoration (working with at-risk youth).
- The **Pre-Post Test design** has become the methodological standard, providing exact measurements of physiological and psychological changes before and after forest exposure.

### 4. Socioeconomic and Environmental Significance

Forest therapy is recognized not only for its health benefits but also as:

- **An economic opportunity:** Driving wellness tourism and the sustainable development of rural areas (Italy, Türkiye).
- **A management tool:** Harmonizing timber production with the recreational functions of forests (Czechia).
- **A conservation driver:** Acting as an environmentally friendly model that fosters awareness of natural heritage protection for future generations.

While **Poland and Lithuania** are building a robust theoretical and bibliometric foundation, **Italy** is successfully translating theory into public health practice. **Czechia** contributes innovative perspectives on social dimensions and technology, while **Türkiye** identifies vast potential within the tourism sector. The common denominator for future development is the need for further research—specifically regarding sensory influences and exposure time—and the establishment of unified standards for site certification to ensure the quality and safety of therapeutic services.

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### Acknowledgement

This study was supported by the Erasmus+ Programme of the European Union. The contents reflect only the authors' views and neither the European Commission nor the Turkish National Agency can be held responsible for any use of the information contained therein. (Project No: KA220-HED-A21035FB)

### Souhrn

Projekt „Začlenění přírody do vysokoškolského vzdělávání: Lesní koupele“ si klade za hlavní cíl vytvořit digitální vzdělávací moduly věnované lesním koupelím, aby se tato praxe stala známější a dostupnější. K dosažení tohoto cíle je nejprve důležité posílit dovednosti a znalosti pedagogických pracovníků. Jakmile akademici dosáhnou dostatečné úrovně znalostí o lesních koupelích, budou přispívat k tomu, aby společnost mohla těžit z významného vlivu přírody na duševní zdraví a pohodu jednotlivců. Naším cílem je pomocí digitálních vzdělávacích modulů zpřístupnit myšlenku lesní koupele akademickým pracovníkům a studentům v jiných oborech, včetně lesnictví a sociálních věd. V tomto článku popisujeme základní informace o současném stavu lesní terapie a lesní koupele v 5 evropských zemích.

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