

Shinrin-yoku/ Forest bathing: A natural way to promote health, prevention and cure diseases. The heritage of Master Peter Dunov in Forest Medicine

Tatyana Tomova, Diana Popova-Dobрева
National Sports Academy 'Vasil Levski'

Abstract: *Shinrin-yoku or Forest Bathing is a traditional Japanese practice that involves immersing oneself in nature and mindfully engaging all five senses. This practice was introduced by the Japanese government in the 1980s to help urban residents cope with work-related stress. There are currently 60 studies available in the medical database PubMed that are related to Shinrin-yoku. Publications can be divided into the following main areas: health promotion, disease prevention, and treatment. The effects of forest bathing on health include improved cardiac and vascular function, blood pressure-lowering effects, decreased blood glucose levels in diabetic patients, pain reduction, enhanced mental health, benefits for neurological rehabilitation, support for individuals with intellectual disabilities, and potential benefits for COVID-19 recovery. The research draws a parallel with the heritage of Teacher Dunov in forest therapy.*

Key words: Shinrin-yoku, Forest Medicine

Ключови думи: Shinrin-yoku, горска терапия



Tatyana Tomova is full time Chief Assistant, Ph.D in the Department of Sports Medicine, sector Sports Massage at the Faculty of public health, health care and tourism at the National Sports Academy 'Vasil Levski'.

E-mail: tomova.tatyana@abv.bg

Diana Popova-Dobрева, Ph.D, is full time Associate Professor in the 'Theory and Methodology of Kinesitherapy' department, in the Faculty of Public Health, Health Care and Tourism in National Sports Academy 'Vasil Levski'.

E-mail: dobreva_da@yahoo.com

1. FOREST BATHING

Forest medicine is a new interdisciplinary science belonging to the categories of alternative medicine, ecological medicine and preventive medicine that studies the effects of the forest environment (forest bathing/Shinrin-yoku) on human health. People have enjoyed the forest environment for centuries because of its quiet atmosphere, beautiful scenery, mild climate, pleasant scents and fresh, clean air. In recent years, a series of scientific studies have been conducted in Japan to investigate the effects of the forest environment on human health¹.

Tokyo's Arisugawa-no-miya Memorial Park offers such an environment, with its dense forests, hills, valleys, lakes and waterfalls, amidst natural beauty, providing a tranquil escape for stressed-out city residents. Walking along the streamside paths, amidst the sounds of chirping birds and bubbling water, brings the feeling of being deep in the mountains.

¹ Qing Li 2019.

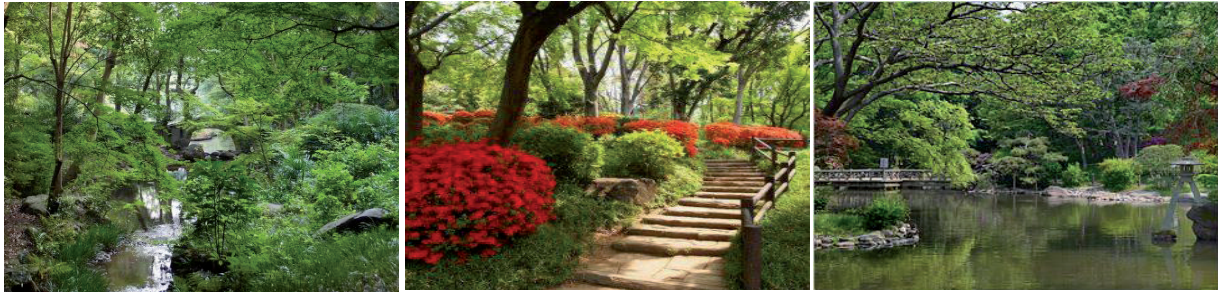


Figure 1, 2 and 3. Arisugawa-no-miya Memorial Park in Tokyo.

2. SCIENTIFIC RESEARCH IN PUBMED

We currently found 60 studies in the PubMed medical database that are related to Shinrin-yoku (Fig. 4). In Japan, serial studies have been conducted since 2004 to investigate the effects of forest environment on human

health (forest bathing/ Shinrin-yoku)². These studies investigate various aspects of health and potential benefits of incorporating Shinrin-yoku. Publications can be divided into the following main areas: health promotion, prevention and treatment of diseases.

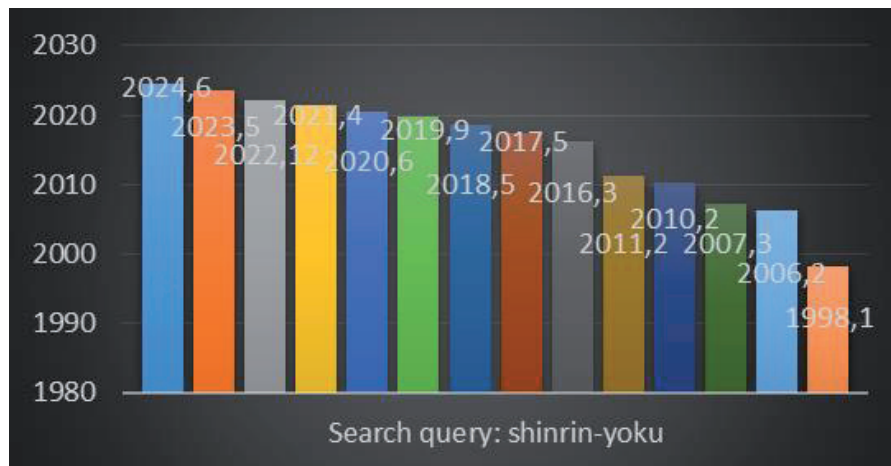


Figure 4. Scientific research in PubMed.

HEALTH PROMOTION

Includes activities and initiatives aimed at improving overall health and well-being. Health promotion also includes educating people about healthy lifestyles, promoting physical activity, good nutrition and mental health practices. The results of practicing SY have shown that the natural environment has significant benefits for the mind, body and soul in different age groups. Ongoing research is being promoted globally for short and long term health outcomes for all individuals³.

In their study, Song, C., et al. evaluated the physiological and psychological effects of short walks in the woods on young women. The experiments were conducted in 6 forests (test) and 6 urban areas (control). A total of 60 participants, average age: 21.0 ± 1.3 years, were instructed to walk in a forest and an urban area for approximately 15 min. Simultaneously, their heart rate variability, blood pressure and pulse rate were measured to quantify the physiological response from practice. Walking in the woods was associated with significantly

² Qing Li 2019.

³ Vermeesch et al. 2024.

higher parasympathetic nerve activity and lower sympathetic nerve activity as well as heart rate. Negative feelings, such as tension, anxiety, depression, despondency, anger, hostility, fatigue, and confusion, were significantly lower, as were general mood disturbance and measures of anxiety. Subjective ratings were generally consistent with physiological responses. In conclusion, the authors say that a short walk in the woods leads to physiological and psychological relaxation effects in young women⁴.

Other studies have tracked salivary amylase activity as an excellent indicator of changes in sympathetic nerve activity. After measuring salivary amylase activity before and after walking in urban and forest environments using a handheld monitor, results showed that circadian rhythm fluctuations in salivary amylase activity were much smaller than variations induced by a stressful environment. In conclusion, the forest is a good environment in which people can experience much less stress arising from the environment⁵.

DISEASE PREVENTION

Shinrin-yoku, or forest bathing, has received increasing attention from a preventive medicine perspective in recent years. These studies focus on measures taken to prevent the onset of diseases or to detect and treat diseases at an early stage. Disease prevention aims to reduce risk factors and eliminate causes of disease, thereby minimizing the frequency and impact of disease on individuals and communities.

Park, B. J., et al. review previous research on the physiological effects of Shinrin-yoku and present new results from field experiments conducted in 24 forests in Japan. Salivary cortisol, blood pressure, pulse rate, and heart rate variability were used as indices. The results showed that the forest environment promotes lower cortisol concentrations, lower heart rate, lower blood pressure, greater parasympathetic

nervous system activity, and lower sympathetic nervous system activity than the urban environment. These results will contribute to the development of a research area dedicated to forest medicine that can be used as a preventive medicine strategy⁶.

Another study aimed to investigate the effects of bathing in the woods on salivary or serum cortisol levels as a biomarker of stress to see if this method could reduce stress. The main results of the meta-analysis showed that salivary cortisol levels were significantly lower in forest groups compared to urban groups. Overall, forest bathing may significantly affect cortisol levels in the short term in such a way as to reduce stress, and the expected placebo effects may play an important role in this. Further research is recommended due to the limited data available⁷.

TRENDS IN THERAPEUTIC RESEARCH AND TREATMENT OF DIFFERENT DISEASES ARE CONCERNED WITH THE FOLLOWING TOPICS:

- Cardiovascular function. Blood pressure lowering effect;
- Lowering blood sugar levels in diabetic patients;
- Shinrin-yoku as a possible method to reduce stress and achieve mental health;
- Mental health
- The interconnection of Shinrin-Yoku and spirituality;
- Neurological rehabilitation;
- COVID 19

CARDIO-VASCULAR FUNCTION. BLOOD PRESSURE LOWERING EFFECT

Some studies report that the forest environment reduces blood pressure. However, little is known about the possibility of antihypertensive uses of Shinrin-yoku. The study by Yuki Ideno et al. specifically evaluated the preventive or therapeutic effects of the forest environment on blood pressure. This

⁴ Song 2019.

⁵ Yamaguchi 2006.

⁶ Park et al. 2010.

⁷ Antonelli, Barbieri & Donelli 2019.

systematic review showed a significant effect of Shinrin-yoku on reducing blood pressure. Systolic and diastolic blood pressure among forest environment was significantly lower than that without its application⁸.

Another study tracking the effects of forest bathing in adults suffering from prehypertension or hypertension so as to provide guidance for future interventions or research. Fourteen articles eligible for inclusion in this review revealed that forest bathing interventions were effective in reducing blood pressure, lowering pulse rate, increasing heart rate variability (HRV) power, improving cardiopulmonary parameters and metabolic function, inducing positive mood, reducing anxiety levels and improving quality of life of participants with prehypertension or hypertension. Forest walks and forest therapy programs were the two most effective forest bathing interventions. Studies have reported that practicing a forest walking or forest therapy program can result in short-term physiological and psychological benefits. It concludes that forest bathing, has physiological and psychological relaxing effects on middle-aged and elderly people with prehypertension and hypertension⁹.

REDUCING BLOOD SUGAR LEVELS IN DIABETIC PATIENTS

Ohtsuka, Y. Et al, investigated the effects of Shinrin-yoku (forest air bathing and walking) on blood glucose levels in diabetic patients. Eighty-seven (29 men and 58 women) non-insulin-dependent diabetic patients participated in the present study. The average blood glucose level as well as glycated hemoglobin level decreased after walking short and long distances, respectively. Because the forest environment causes changes in hormone secretion and autonomic nervous functions, it has been suggested that in addition to increased calorie consumption and improved insulin sensitivity, walking in a forest environment has

other beneficial effects in reducing blood sugar levels¹⁰.

SHINRIN-YOKU AS A POSSIBLE METHOD TO REDUCE STRESS AND ACHIEVE MENTAL HEALTH

There is a growing awareness that spending more time in nature is associated with improved human well-being, yet the prescription for SY/forest bathing is still limited. The aim of this systematic review was to examine the physiological and psychological benefits of different forest therapies on healthy and pathological adult populations (>60 years) to identify the most effective type, duration and frequency of these interventions. Walking in the woods, alone and in combination with other activities, is the most effective intervention. Selected studies reported positive effects on physical indicators, including reductions in blood pressure and heart rate and improvements in cardiopulmonary and neurochemical parameters. Beneficial changes have also been noted in the psychological domain, with improvements in depression, reduced stress levels and improved quality of life. In conclusion, the authors note that walking in the forest may play an important role in promoting physical and mental health in healthy and pathological adult populations. However, the lack of high-quality studies limits the power of the results, requiring more trials¹¹.

Other studies have also tracked the physiological and psychological benefits of the Japanese natural therapeutic practice SY. This review article has narrowed its focus to include recent literature on the beneficial effects of forest bathing on heart rate variability, expressed as an increase in InHF, indicating activation of the parasympathetic nervous system and also its effect on reducing anxiety¹².

Emi Morita's study aims to find out if walking more often in the forest is associated

⁸ *Ideno et al. 2017.*

⁹ *Yau & Loke 2020.*

¹⁰ *Ohtsuka 1998.*

¹¹ *Piva et al. 2022.*

¹² *Farrow & Washburn 2019.*

with better sleep quality. In conclusion, the results suggest that increasing the frequency of forest walks or Shinrin-yoku can be effective in preventing insomnia in women¹³.

The present study suggests that bathing in the forest may have potential preventive effects on depression (depressive status). The forest bathing program significantly increases serum serotonin levels and significantly increases the vitality score and decreases the fatigue score in the follow-up tests. The forest bathing program also improved alertness on rising in the morning and the feeling of refreshment (recovery from fatigue)¹⁴.

PSYCHOLOGICAL EFFECTS OF FOREST ENVIRONMENT ON HEALTHY ADULTS: SHINRIN-YOKU AS A POSSIBLE METHOD TO REDUCE STRESS AND IMPROVE MENTAL HEALTH

The study by E. Morita et al. reveals that the forest environment is beneficial in terms of acute emotions, especially in chronic stress conditions. Accordingly, they considered that shinrin-yoku could be used as a method of stress reduction, and the forest environment could be considered therapeutic. It can help reduce the risk of diseases associated with psychosocial stress¹⁵.

Good mental health helps people reach their full potential, cope more easily with the stresses of everyday life, and be more productive and communicative with others.

THE INTERCONNECTION OF SHINRIN-YOKU AND SPIRITUALITY

Besides the fact that Shinrin-yoku (SY/ bathing in the forest) improves people's physiological and psychological health and well-being through the conscious use of the five human senses while relaxing in a natural environment, in addition, it can be effective in enhancing or revealing human

spirituality. The World Health Organization defines an individual's well-being as realizing the fullest possible physical, psychological, social, spiritual and economic self¹⁶. Recent evidence suggests that nature promotes spiritual well-being. Reviewing the scope of the literature on the evidence of the SY/nature-spirituality connection in order to identify knowledge gaps and to support further empirical research, the authors find that, despite differing research methodologies and publications, nature can have a positive effect on human spirituality and therefore enrich well-being. They conclude that SY is an integrative practice that can enhance and promote human spirituality. More research is needed to determine the relationship between SY and human spirituality in achieving the fullest possible self-development¹⁷.

COVID 19

In a review of the literature on finding non-medical strategies to reduce serum cortisol levels during COVID in medical professionals, author J. Pasiaka recommends that everyone personally explore different therapies and incorporate some of them into their daily routine in the future as primary methods of prevention and recovery after illness. Some of these therapies include yoga practices, Shinrin-Yoku or 'bathing in the woods', music, art, etc¹⁸.

The human health benefits associated with immersion in nature continue to be researched. Longitudinal studies conducted globally are needed to generate new evidence on the links associated with Shinrin-Yoku and clinical therapeutic effects. Natural therapy as a method of health promotion and potential universal health model is associated with reducing the reported modern 'stress state' and 'technostress' contributing increasingly to increased disease¹⁹.

¹³ Morita 2024.

¹⁴ Li et al. 2022.

¹⁵ Morita 2007.

¹⁶ WHO 2010.

¹⁷ Hansen & Jones 2020.

¹⁸ Pasiaka 2021: 171 (1), 94–95.

¹⁹ Hansen et al. 2017.

THE HERITAGE OF THE TEACHER PETAR DUNOV IN FOREST MEDICINE

‘Man must live according to the laws of nature’.

The problems of today’s society caused by increased levels of stress, overwork and exhaustion are lowering resilience and contributing increasingly to increased mental and somatic illness by reducing quality of life. This is increasing interest and attention in seeking a way out and finding adequate ways to maintain good physical and psycho-emotional health. More and more physicians, therapists, and scientists are attributing their observations and achievements to the natural lifestyle. Nature as a primordial and natural way of healing and preventing various diseases can contribute to keeping us healthy physically and mentally. It is a good alternative to reduce stress and tension which are the root of most diseases today. According to Master Peter Dunov, we can have a normal and healthy life only when we use our body’s energy properly and perceive the energies from the outside world, from the rational nature, correctly. He says, ‘Love the living nature, the plants, the

forests, in order to connect with the forces that are at work in them. They are a store house of energy from where man can draw what is needed for his organism’²⁰.

‘The first task of science is to provide such knowledge that will ensure man’s health’²¹

As early as the beginning of the last century, Peter Dunov puts forward a theory according to which regular physical activity is the key to man’s physical and mental health. He also believed that a lack of sufficient movement leads to worsening health, and that appropriate physical activity regulates blood circulation, supports the functions of the various systems in the body, strengthens the will, enhances thought and has a beneficial effect on the emotions. Peter Dunov recommends regular exercise and complexes, breathing practices, walks and excursions in nature to preserve health²². It can be said that Master Dunov gave in his speech ‘the key concepts of the holistic worldview of man and his health and laid the foundations of holistic medicine in Bulgaria’²³.

‘No pharmacy in the world can give man what nature gives him’.

PANEURHYTHMY



Figure 5. Paneurhythmy.

²⁰ Dunov 1949: 92.

²¹ Ibidem.

²² Chervenкова 2013: 46.

²³ Dunov 2010: 9.

²⁴ Jonov 2003: 13.

²⁵ Dunov 1938: 65; Dunov 1995: 5-13.

‘Paneurhythmy is a reasonable exchange with the forces of living nature’.

The role and place of man in nature and his relationship to the origin of life finds its philosophical grounding in Paneurhythmy²⁴. Paneurhythmy is a unique Bulgarian system of motor exercises for health, performed to music, in pairs, arranged in a circle, in nature. The aim of Paneurhythmy is to contribute to the improvement of health, stimulate spiritual development and to achieve harmony of man with nature. It is a highly effective practice that takes care of both body and spirit. According to Master Dunov, Paneurhythmy is created to accurately reflect natural rhythms and cosmic rhythms. The activities of Paneurhythmy are rhythmic and very closely related to the rhythm of nature²⁵. It is the cyclicity of physiological processes that provides the regulation in the human organism²⁶. Paneurhythmy has a complex effect as it is built on the unity of movement, music and nature²⁷.

‘Paneurhythmy is a science that regulates the physical, spiritual and mental functions of man’.

‘While practicing Paneurhythmy one draws strength from the living energies of nature and gets in sync with the natural rhythm’.

GUIDELINES FOR SCIENTIFIC STUDIES RELATED TO EMPIRICALLY KNOWN BENEFITS OF THE PANEURHYTHMY

Practicing the exercises of Paneurhythmy creates prerequisites and conditions for achieving a positive effect in the following areas²⁸:

- Strengthening of the locomotory system and improvement of the posture, reversal of spinal curvatures and their correction, if present.
- Restores mobility and joint function.
- Improving general performance and physical condition.

- Prevention of cardiovascular diseases and metabolic diseases – stabilizes blood pressure and normalizes metabolic processes.

- Fine regulation at the level of the respiratory, nervous and endocrine systems.

- Reduces stress and increases resistance to it. Reduces depressive symptoms.

- Reports an improvement in mood and self-esteem.

- Improving the general mental tone and the body's defences.

- Impact on intellectual and emotional development

- Stimulating the creative activity of the personality and aesthetic education.

- The vigorous exercise regime is suitable for people with health problems, for recovery and health maintenance²⁹.

WHAT IS THE IMPACT OF PANEURHYTHMY?

Impact on the physical condition

Playing outdoors, in the fresh air and smooth deep breathing improves blood circulation³⁰. This has a healing effect on the respiratory system and normalizes blood circulation. Muscle tone, body fitness and blood circulation are improved, which eases the work of the heart. It also improves the functions of the cardiovascular, nervous and endocrine systems. Stabilization of blood pressure is reported. In patients with diabetes, metabolic processes are normalized. Peter Dunov points out that Paneurhythmy also promotes good physiological effects and balance of the ‘respiratory, brain and digestive systems’³¹.

Impact on the mental and spiritual state

Mastering coordination in movements improves the ability to concentrate and provides stability of attention. The cognitive processes for imaginative and positive thinking, for emotional experience under the influence of music and text of individual exercises are enriched. Perceptions and representations

²⁶ Chervenкова 2013: 59.

²⁷ Kajkov 2007: 9.

²⁸ Jonov 2003: 15.

²⁹ Kajkov 2007: 17; Tilev 2007: 120-121.

³⁰ Dunov 2000: 59.

³¹ Dunov 2000: 52-54; Chervenкова 2013; Kajkov 2007, 14-15; Jonov 2003: 14-15, Tilev 2007: 131.

become more complete. The thinking process is improved. Mental resilience and perseverance are increased. Creativity is strongly developed. Willpower improves³².

‘Doctors have a high mission – to teach people to live properly, to apply the laws of rational nature!’

More and more authors are proving that Paneurythmy is not only a system for self-improvement and harmonious development of the personality, but also a superior healing method³³. Here are outlined the main distinct effects of Paneurythmy, which for us as researchers are a broad field for further research in search of methods and scientific approaches to prove and more fully clarify its all-round impact on the personality³⁴.

CONCLUSION

The new medical science called forest medicine includes all the beneficial natural influences that immerse a person in a relaxing and pleasant environment for the senses and spirit. In combination with moderate physical activity, they have a comprehensive and positive influence on many components of the psycho-physical state. This natural diversity gives us the choice of how to achieve health and harmony easily and affordably through nature’s richness. Paneurythmy is a valuable part of Bulgarian spiritual and cultural heritage and its good knowledge and application can contribute to effective maintenance of physical condition, mental health and well-being, social functioning and improved quality of life (Fig. 6).



Figure 6. Rila lakes.

BIBLIOGRAPHY:

Ancheva 2007: Ancheva, Daniela. Специализация за преподаватели по Паневритмия: условия, полезност, възможности. В: Трета научна конференция по Паневритмия. Институт за изследване и прилагане на Паневритмията, ISBN-10: 954-90922-5-9. ISBN-13: 978-954-90922-5-7. [Specializacij za преподаvateli po Panevritmia: usloviq, poleznost, vuzmojnosti: Treta nauchna konferencia po Panevritmia]. Sofia, 2007, 100-108.

Chervenкова 2013: Chervenкова, Ludmila. Паневритмия здраве и благополучие. Един български модел за двигателна активност. София: УИ „Климент Охридски“. ISBN 978-954-07-

3575-7. [Panevritmia zdrave i blagopoluchie. Edin bulgarski model za dvigatelna aktivnost]. Sofia.

Dinov 1938: Dinov, Peter. Посока на растене. [Posoka na rastene]. МОК (1932 – 1933) I Том.

Dinov 1949: Dinov, Peter. Великата мъдрост. [Velikata mudrost]. МОК (1932 – 1933) I Том.

Dinov 1949: Dinov, Peter. Съразмерност в природата. [Syrasmernost v prirodata]. МОК (1932-1933) II Том.

Dinov 1993: Dinov, Peter. Паневритмия. [Panevritmia], Sofia.

Dinov 2000: Dinov, Peter. Окултни упражнения. [Okultni upravneniq]. Sbornik s izvadki ot lekci. Sofia.

³² Chervenкова 2013; Kajkov 2007: 14-15; Jonev 2003: 14-15.

³³ Lambova et al, 2006-2007: 117; Ancheva 2006-2007: 103; Chervenкова 2013.

³⁴ Milcheva 2003: 121-122.

Dinov 2010: *Dinov, Peter*. Абсолютната справедливост. [Absolutnata spravedlivost]. ОКК, 4 год. (1924 – 1925).

Jonov 2003: *Jonov, Jonko*. Паневритмията като система за хармонично развитие на човека и обществото. В: Втора научна конференция по Паневритмия. Сдружение Паневритмия, ISBN – 954-90922-3-2. [Panevritmiata kato sistema za harmonichno razvitie na choveka i obshtestvoto: Vtora nauchna konferencia po Panevritmia]. Sofia, 2003, 13-15.

Lambova, Ilieva 2007: *Lambova, Krasimira, Dimitrina. Ilieva*. Паневритмията – възможности за хармонично развитие на хора с напреднала възраст. В: Трета научна конференция по Паневритмия. Институт за изследване и прилагане на Паневритмията, ISBN-10: 954-90922-5-9. ISBN-13: 978-954-90922-5-7. [Panevritmiata – vuzmojnosti za harmonichno razvitie na hora s naprednala vuzrast: Treta nauchna konferencia po Panevritmia]. Sofia, 2007, 109-118.

Kajkov, Qnkova 2007: *Kajkov, Dimitar, Antoaneta Qnkova*. Здраве чрез движение сред природата. В: Трета научна конференция по Паневритмия. Институт за изследване и прилагане на Паневритмията, ISBN-10: 954-90922-5-9. ISBN-13: 978-954-90922-5-7. [Zdrave chrez dvijenie sred prirodata: Treta nauchna konferencia po Panevritmia]. Sofia, 2007, 8-17.

Qnkova 2001: *Qnkova, Antoaneta*. Паневритмията като система за хармонично развитие на човека и обществото. В: Първа научна конференция по Паневритмия. София: НСА ПРЕС. [Panevritmiata kato sistema za harmonichno razvitie na choveka i obshtestvoto: Puvra nauchna konferencia po Panevritmia]. Sofia, 2001, 17-23.

Qnkova 2007: *Qnkova, Antoaneta*. Паневритмията като система за хармонично развитие на човека и обществото. В: Трета научна конференция по Паневритмия. Институт за изследване и прилагане на Паневритмията, ISBN-10: 954-90922-5-9. ISBN-13: 978-954-90922-5-7. [Panevritmiata kato sistema za harmonichno razvitie na choveka i obshtestvoto: Treta nauchna konferencia po Panevritmia]. Sofia, 2007, 56-59.

Tilev, Koleva, Milcheva 2007: *Tilev, Tilio, Koleva, Ivanka, Nadka Milcheva*. Оптимизиране на сърдечно-съдовата дейност чрез Паневритмията. В: Трета научна конференция по Паневритмия. Институт за изследване и прилагане на Паневритмията, ISBN-10: 954-90922-5-9. ISBN-13: 978-954-90922-5-7. [Optimizirane na syrdecho-sydovata dejnost chrez Panevritmiata: Treta nauchna konferencia po Panevritmia]. Sofia, 2007, 114-118.

Antonelli, Barbieri & Donelli 2019: *Antonelli, Michelle, Barbieri, Grazia, Donelli Davide*. Effects of

forest bathing (shinrin-yoku) on levels of cortisol as a stress biomarker: a systematic review and meta-analysis. *Int J Biometeorol*. 2019 Aug;63(8):1117-1134. doi: 10.1007/s00484-019-01717-x. Epub 2019 Apr 18. PMID: 31001682.

Farrow, Washburn 2019: *Farrow Marc R., Washburn, Kyle*. A Review of Field Experiments on the Effect of Forest Bathing on Anxiety and Heart Rate Variability. *Glob Adv Health Med*. 2019 May 16;8:2164956119848654. doi: 10.1177/2164956119848654. PMID: 31192052; PMCID: PMC6540467.

Piva et al. 2022: *Piva Giovanni, Caruso Lorenzo, Gymez Alberto Cruz, Calzolari Marta, Visintin Emilio Paolo, Davoli Pietromaria, Manfredini Fabio, Storari Alda, Spinozzi Paola, Lamberti Nicola*. Effects of forest walking on physical and mental health in elderly populations: a systematic review. *Rev Environ Health*. 2022 Oct 17;39(1):121-136. doi: 10.1515/reveh-2022-0093. PMID: 36239186.

Hansen, Jones, Tocchini 2017: *Hansen, Margaret, Mary, Reo Jones, Kirsten Tocchini*. Shinrin-Yoku (Forest Bathing) and Nature Therapy: A State-of-the-Art Review. 2017 Jul 28;14(8):851. doi: 10.3390/ijerph14080851. PMID: 28788101; PMCID: PMC5580555; DOI: 10.3390/ijerph14080851

Hansen, Jones 2020: *Hansen, Margaret, Mary, Jones, Reo*. The Interrelationship of Shinrin-Yoku and Spirituality: A Scoping Review. 2020 Dec;26(12):1093-1104. doi: 10.1089/acm.2020.0193. Epub 2020 Sep 15.

Ideno et al. 2017: *Ideno Yuki, Hayashi Kunihiko, Abe Yukina, Ueda Kayo, Iso Hiroyasu, Noda Mitsuhiko, Lee Jung-Su, Suzuki Shosuke*. Blood pressure-lowering effect of Shinrin-yoku (Forest bathing): a systematic review and meta-analysis. *BMC Complement Altern Med*. 2017 Aug 16;17(1):409. doi: 10.1186/s12906-017-1912-z. PMID: 28814305; PMCID: PMC5559777.

Li 2019: *Li, Qing*. Effect of forest bathing (shinrin-yoku) on human health: A review of the literature. 2019 May 13; S1 (HS):135-143. doi: 10.3917/spub.190.0135.

Li 2022: *Li, Qing*. Effects of forest environment (Shinrin-yoku/Forest bathing) on health promotion and disease prevention -the Establishment of 'Forest Medicine'. PMID: 36328581 PMCID: PMC9665958 DOI: 10.1265/ehpm.22-00160

Li et al. 2022: *Li Qing, 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. doi: 10.1265/ehpm.22-00136. PMID: 36328588; PMCID: PMC9665960.

Morita et al. 2006: *Morita Emi, Fukuda S, Nagano J, Hamajima N, Yamamoto H, Iwai Y, Nakashima T, Ohira H, Shirakawa T*. Psychological effects of

forest environments on healthy adults: Shinrin-yoku (forest-air bathing, walking) as a possible method of stress reduction. *Public Health*. 2007 Jan;121(1):54-63. doi: 10.1016/j.puhe.2006.05.024. Epub 2006 Oct 20. PMID: 17055544.

Morita et al. 2024: Morita Emi, Kadotani H, Yamada N, Sasakabe T, Kawai S, Naito M, Tamura T, Wakai K. The Inverse Association between the Frequency of Forest Walking (Shinrin-yoku) and the Prevalence of Insomnia Symptoms in the General Japanese Population: A Japan Multi-Institutional Collaborative Cohort Daiko Study. *Int J Environ Res Public Health*. 2024 Mar 15;21(3):350. doi: 10.3390/ijerph21030350. PMID: 38541349; PMCID: PMC10970638.

Ohtsuka et al. 1998: Ohtsuka Y, Yabunaka N, Takayama S. Shinrin-yoku (forest-air bathing and walking) effectively decreases blood glucose levels in diabetic patients. *Int J Biometeorol*. 1998 Feb;41(3):125-7. doi: 10.1007/s004840050064. PMID: 9531856.

Park et al. 2010: Park Bum Jin, Tsunetsugu Yuko, Kasetani Tamami, Kagawa Takahide, Miyazaki Yoshifumi. The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. *Environ Health Prev Med*. 2010 Jan;15(1):18-26. doi: 10.1007/s12199-009-0086-9. PMID: 19568835; PMCID: PMC2793346.

Pasioka 2021: Pasioka, Janice L. Shinrin-yoku, yoga and other strategies in the fight against COVID-19. *Surgery*. 2022 Jan;171(1):94-95. doi:

10.1016/j.surg.2021.07.044. Epub 2021 Aug 31. PMID: 34548159; PMCID: PMC8405594.

Song et al. 2019: Song Chorong, Ikei Harumi, Kagawa Takahide, Miyazaki Yoshifumi. Effects of Walking in a Forest on Young Women. *Int J Environ Res Public Health*. 2019 Jan 15;16(2):229. doi: 10.3390/ijerph16020229. PMID: 30650572; PMCID: PMC6351942.

Vermeesch et al. 2024: Vermeesch Amber L, Ellsworth-Kopkowski Alexis, Prather Jenifer G, Passel Cheryl, Rogers Heidi Honegger, Hansen Margaret M. Shinrin-Yoku (Forest Bathing): A Scoping Review of the Global Research on the Effects of Spending Time in Nature. *Glob Adv Integr Med Health*. 2024 Feb 27;13:27536130241231258. doi: 10.1177/27536130241231258. PMID: 38420597; PMCID: PMC10901062.

WHO 2010: Global recommendation on Physical Activity for Health, WHO Library Cataloguing-Publication Data.

Yamaguchi et al. 2006: 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 Mar-Apr;34(2):152-9. doi: 10.1177/147323000603400204. PMID: 16749410.

Yau & Loke 2020: Yau Ka-Yin Katherine, Loke Ailice Y. Effects of forest bathing on pre-hypertensive and hypertensive adults: a review of the literature. *Environ Health Prev Med*. 2020 Jun 22;25(1):23. doi: 10.1186/s12199-020-00856-7. PMID: 32571202; PMCID: PMC7310560.

Shinrin-yoku / Горско къпане: естествен начин за промоция на здравето, профилактика и лечение на болести. Наследството на Учителя Петър Дънов в горската медицина

Татяна Томова, Дияна Попова-Добрева

Shinrin-yoku или къпането в гората е традиционна японска практика, която включва потапяне в природата и внимателно ангажиране на всичките пет сетива. Тази практика е въведена от японското правителство през 80-те години на миналия век, за да помогне на градските жители да се справят със стреса, свързан с работата. Понастоящем в медицинската база данни PubMed има 60 проучвания, които са свързани с Shinrin-yoku. Публикациите могат да бъдат разделени в следните основни области: промоция на здравето, профилактика и лечение на заболявания. Ефектите от къпането в гората върху здравето включват подобряване на сърдечно-съдовата функция, ефекти на понижаване на кръвното налягане, понижени нива на кръвната захар при пациенти с диабет, намаляване на болката, подобро ментално здраве, ползи при неврологична рехабилитация, подкрепа за хора с интелектуални затруднения и потенциални ползи за възстановяване от COVID-19. В изследването се прави паралел с наследството на Учителя Дънов в горската терапия.